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ABSTRACT

In this paper we examine the role of variable risk preferences and aspiration levels on the growth of 23,286 new Swedish firms. Using pooled time-series regression, we find that new and small firms react to performance feedback by threat rigidity, decreasing their levels of organic growth. Larger and older firms react in the opposite way by raising their level of growth if performance falls short of their aspiration level, as predicted by the behavioral theory of the firm. Our findings suggest that as firms grow and age, they alter their risk behavior.

INTRODUCTION

Researchers in entrepreneurship have not yet come to a conclusive explanation of what leads the decision makers in new firms to engage in the risky practice of growing their firms. Greater size is often associated with important advantages. With size comes a stronger market position and more resources. Size signals a successful firm and allows the firms to attract better personnel and initiate strategic alliances. Obviously, size can also be associated with drawbacks such as bureaucracy, increased agency costs and inertia. The purpose of this study is to begin to specify more systematically under which conditions decision makers in new firms engage in growth.

Organizational learning theory, or “performance feedback theory” (Greve, 2003) seems particularly well suited for specifying under which circumstances organizational decision makers are likely to accept the risk and uncertainty associated with expanding a new firm. The theory suggests a process based on three components; (1) organizations learn from their experience; (2) decision makers use an aspiration level to evaluate performance; (3) performance relative to the aspiration level influence their inclination to increase their investments, initiate strategic organizational changes, or exit a market (Cyert & March, 1963; Greve, 1998).

Performance feedback behavior is especially important in new firms, where the entrepreneurial team has to learn about its capacity to develop the new organization, and about the value of the business opportunity the business is founded upon. From this perspective, the aspired level of performance in new entrepreneurial firms is "the smallest outcome that would be deemed satisfactory by the decision maker" (Schneider, 1992: 1053). Depending whether a firm performs below or above their aspiration level, organizational learning theory suggests that the firm will be more or less prone to take risks and initiate changes. Hence the relationship between aspiration levels and firm performance is likely to dictate if the firm is going to risk investing in further growth, keep the same size, or exit the market altogether.

A substantial empirical literature has examined the association between performance, variation in risk preference, and organizational change. However, relatively few or no studies have examined new firm evolution from the perspective of risk taking and aspiration levels. One study examined small firms relative performance with their willingness to exit (Gimeno, Folta, Cooper, & Woo, 1997), but we have found no studies that specifically address the formation of aspiration affects the growth and development of new ventures. However, recent evidence from Audia and Greve’s (2006) study of the Japanese ship building industry suggest that large and small firms differ in how aspiration levels affect risk behavior. The current paper elaborates on these findings by suggesting that risk behavior changes as firms mature.
and grow. Our study fills an empirical gap in the literature by examining the role of risk and aspiration levels among really young ventures, and their subsequent development over time.

We test our ideas on a sample of 23,286 new Swedish firms started between 1995 and 2002. Most studies of firm growth have been modeled on samples dominated by incumbent firms. The current study is therefore, to the best of our knowledge, the first in its kind to test the aspiration-level predictions of organizational learning theory in a setting of new entrepreneurial firms. The results of our study indicate that risk behavior changes during the evolution of new firms. While very new firms seem to have a focus on survival as predicted by the theory of threat rigidity (Staw, Sandelands & Dutton, 1981), slightly larger firms grow according to the goal-attentive behavioral suggested by behavioral theories of firm evolution (Cyert & March, 1963; Greve, 2003).

### VARIABLE RISK PREFERENCES AND FIRM EVOLUTION

Entrepreneurship theory and organizational learning theory share a common emphasis on risk and uncertainty. In entrepreneurship theory, firm growth has been explained by theories of strategic orientation (Wiklund & Shepherd, 2003) or by psychological theories of individual entrepreneurs’ growth motivation (Davidsson, Delmar & Wiklund, 2007). In organizational learning theory, firm growth has been explained as a process formed by growth initiated by decision makers’ search for an optimal scale by social comparison between theirs and similar organizations (Greve, 2006). The basic idea of theories of variable risk preferences is that performance relative to some reference point or level of aspiration has systematic effects on the propensity to engage in risky activities, such as firm growth. While suggesting slightly different focus in terms of internal viz. external triggers, studies in both theoretical traditions posit that firm growth is initiated by psychological processes in the decision makers. We exploit this shared ground on how an organization’s current and anticipated performance affects its decision makers’ propensity to engage in growth.

In addition to the arguments already provided by prior studies (Audia & Greve, 2006; Greve, 2006), we suggest that the choice to expand a firm is not made solely based on performance relative to an aspiration level but is also closely connected to the evolution of a firm. Firms that are younger and smaller behave differently from firms that are older and larger. A fundamental reason for these differences is due to differences in decision-making structure: new firms have not established formally routines necessary to process uncertainty and risk (Nelson & Winter, 1982). For example, it often takes several years for a new firm to establish budget and control systems. This leads decision makers in new organizations to rely on simplifying heuristics and biases instead of formal evaluations of performance (Busenitz & Barney, 1997). From a behavioral perspective, decision makers in new firms are opportunistic and can more easily initiate changes in organizational structure. With age, organizational decision making becomes characterized by formalization and inertial processes, rendering changes in organizational structure more difficult (Carroll & Hannan, 2000). From the perspective of organizational growth, these processes of new firm evolution suggest that firm growth should diminish with age. Firms that have never grown are not likely to engage in growth at all. Firms that have had successful experiences of growth will continue to grow, but at a lower rate. That is, firms above the aspiration level will grow as they age.

In terms of firm size, smaller firms have a more efficient decision making process but do not develop routines for bargaining, control and adjustment processes that are needed in larger firms to establish goals. Risky change is easy when small, but with increasing size, only firms performing below their aspiration level will grow. This size effect is a central assumption to the behavioral theory of the firm (Cyert & March, 1963) and sets it apart from other economic learning theories.

The process by which new firms accumulate structures of formalization into routines as they age and grow suggest that firms will handle risk differently based on their evolution (Nelson & Winter, 1982).
This indicates a contrast in how age and size should affect the risky choices made by managers. These contrasting effects are due to different managerial assumptions. Yet, these effects have never been tested empirically since age and size are so highly correlated.

**ASPIRATION-LEVEL FEEDBACK AND NEW FIRM GROWTH**

Expanding a firm is a risky decision, especially so in the context of Sweden where labor market regulations makes firing, and therefore also hiring, very costly to the firm. To develop our understanding of decision makers’ motivation to grow, we draw upon the literature on organizational risk taking. A central feature of organizational learning theory is that the probability of organizational change is conditional of the firms’ performance history. Change involves risk, and the consequences of organizational change are usually less well-known than the consequences of not changing. Moreover, risk taking is goal oriented. Decision makers will be prepared to take more or less risks depending on whether they are above or below their level of aspiration. The theory of prospect theory suggest that decision makers are prepared to take more risk when they are below their aspired level of performance on some task, compared to when they are above the aspired level (Kahneman & Tversky, 1979). However, boundedly rational decision makers do not respond fluidly and automatically to feedback. They can accept loosing courses of actions or interpret information in a way that allows them to stay inert. Therefore, change is not only a function of information regarding current performance but also crucially affected by how the organizational structure accommodate alterations in strategy and structure (Staw, et al., 1981).

To sum up, firms can choose to grow if they have the opportunity, the motivation, and the resources needed to do so. Here we emphasize the motivation to grow by examining how performance relative to aspiration levels influences the probability of firm growth. A central concept in organizational learning theory is decision makers’ aspiration levels. An aspiration level can be defined as “the smallest outcome that would be deemed satisfactory by the decision maker” (Schneider, 1992, p. 1053). At their simplest level of conceptualization, aspiration levels are cognitive heuristics which turn continuous performance into dichotomous measures of failure or success. It is the reference point or goal that allows decision makers to judge whether they have failed or succeeded depending on if they have performed below or above this reference point. If performance relative to a level of aspiration level is important, then we must understand how aspiration levels are formed. The behavioral theory of the firm posits two processes by which aspiration levels are formed: as a development of the firms’ own historical performance and through social comparison with the performance of similar others (Cyert & March, 1963). People compare themselves with those that they find to be similar with. They do it for self-enhancement, self-assessment and to learn. This is especially important for new firms as most of them, like start-ups, do not have a history of conducting business to compare their performance with. Aspiration levels are also formed by the history of the firm itself. This is a form of adaptive learning taking into consideration internal limitations and allowing some consistency in the organization over time as earlier performance functions as a benchmark. As Greve (1998) remarked, social and historical aspiration levels can be understood as the results of decision makers acting as an intuitive scientist: available data are combined into simple heuristics to create an expectation of future performance, which then becomes the aspiration level.

Decision makers in newly established firms can set size goals for different reasons. One is that they need to reach a sufficient size for the efficient operations of producing, coordinating, and marketing their goods or services (Gooding & Wagner, III, 1985). Another is that they are motivated by the prestige of having created a large and successful organization. A third reason is that with size also comes some degree of organizational safety through the accumulation of slack resources. Size goals are important because they have a direct impact on a firm strategy, especially for new firms where growth is related to significant risks as it often necessitates investments that are difficult to reverse.
Factors that make new firms different from incumbents are that they are usually more resource constrained, lack established routines and most important a history proving environmental fit. With environmentally fit we mean that the firm has adapted its internal structure and transactional relationships to what is commonly used in the industry, at least to the extent that the firm is able to survive. New firms usually enter with small initial investments and have very limited knowledge if they are environmentally fit. In this very early stage or organizational life, entrepreneurs in new firms are unsure about their firms’ capacities to succeed and seek information about whether or not they have made the right investment. From this perspective, then, decision makers in new firms are risk averse rather than risk seeking. Theories of organizational risk taking have posited that, in contrary to the behavioral theory of the firm and prospect theory, performance below an aspiration level heightens awareness of danger and leads to risk aversion (Lopes 1987, Staw et al., 1981). Their general lack of resources, lack of routines and structures, in combination with noisy information and a small initial investment, leads the new firms to refrain from risky changes (i.e., growth) when performance is falling below the aspiration level and focus instead on survival. If decision makers interpret performance below the aspiration level not as a repairable gap, as the behavioral theory of the firm assume, but as a threat to their vital interests, performance below the aspiration level will have a deterring effect on growth. The decision makers in new firms are interested in limiting what is often their own personal investment, leading to risk aversion when early feedback is negative. This can be seen as threat rigidity. We therefore predict that for very new firms the theory of threat rigidity will be more accentuated than the performance feedback effects predicted by the behavioral theory of the firm.

However, if new firms receive positive feedback early on, they will perceive their initial investment as successful (Lopes 1987), decreasing the level of risk aversion in the firm. The firm will be relatively more likely to invest in the expansion to increase the possible return on their investments. These arguments form the bases of our first two hypotheses:

**Hypothesis 1:** Firms performing below their aspiration level will grow less rapidly.

**Hypothesis 2:** For firms performing above their aspiration level, the relation from performance to growth is weaker than for firms below the aspiration level.

### Aspiration-Level Growth and Age

Growth decision are not made solely on the basis of performance relative to the aspiration level, they are also dependent on the evolution of the firm. Firms that are young and small behave differently than firms that older and larger (Mitchell, 1994). Young firms cannot for example rely on historical aspiration levels. Moreover, they lack decision making routines to process uncertainty and risk. This leads decision makers in new organizations to rely on simplifying heuristics and biases. Furthermore, many new entrepreneurs lack established industrial networks and internally organized routines. Their market position is weak, and these entrepreneurial decision makers might be more interested in rapidly expanding in order to achieve a size that they believe to be optimal for survival. They will therefore try to expand their firms rapidly, and feedback relative to aspiration levels might not yet be a relevant heuristic. This is why we believe that new firms will not increase their risk taking behavior when performance falls below their level of aspiration. This could explain why previous empirical research has often noticed that younger firm tend to grow more than older firms (Davidsson, Lindmark & Olofsson, 1998; Davidsson & Delmar, 1997), while they also tend to exit more often.

As firms get older, they become more inert with increased difficulties in changing, but they get more and more confident in their abilities. Their history strongly constrains subsequent possibilities. One reason is that the organization has adapted to what is considered ‘fit’ in its environment. It is seen as an accountable and reliable partner, and has invested in internal routines over time to strengthen its position (Carroll & Hannan, 2000). Because maintaining the status quo is easy and changing is both difficult and
risky, it is relatively more difficult for decision makers to mobilize the motivation to change. Without environmental indications that they need to improve operations in some way, older firms are more interested in protecting what they have already achieved than searching for new opportunities for growth. What implication does this have to the role of performance feedback effects? We think that performance above the aspiration level should lead to growth, but only moderately. Decision makers are satisfied and will not risk what they have achieved, but they may be interested in strengthening their position further. Moderate growth can therefore be a strategic option. More interesting is performance below the aspiration level and how it affects decision making under risk. We believe that performance below the aspiration level will induce risk taking and thus growth more than performance above the aspiration level.

Hypothesis 3: Growth triggered by performance relative to an aspiration level will increase with age.

Hypothesis 4: With larger age, firms performing below their aspiration level will grow more rapidly than firms above their aspiration level.

Aspiration-Level Growth and Size

We expect that smaller and larger firms adopt different risk behavior. This size effect is related to a central assumption to the behavioral theory of the firm and sets it apart from economic learning theories. Smaller firms lack resources and a strong market position. However, their small size reduces problems with conflicting goals. Therefore smaller firms do not need to develop routines for bargaining, control and adjustment processes that are needed in larger firms. Small firms can be said to be entrepreneurial in the economic sense of the word. That is, we have an entrepreneur or a small team who guides their actions of the firm. The goals of the entrepreneurs are the goals of the firm. Previous research indicates that this is one reason why small firms refrain from growing. Smaller firms are easier to handle, and conflicts among the decision makers are less present (Wiklund, Davidsson & Delmar, 2003). Small firms are in a way self-organized, and the sharing of common goals is easy.

Larger firms have more resources to weather bad times, but also more people who would suffer in case of failure. Larger size is often associated with better trained management and more favorable contacts with stakeholders as creditors. However, with size comes an increase in demands on management and bureaucracy. More stakeholders, such for example employees or external shareholders, wants to be present and heard in the decision making processes. Hence, with an increase in size, demand on decision makers change. Research in group dynamics indicate that changes in behavior take place at relative small numbers. Already groups with five persons start to need stricter organizing, clearer goals, and task specification in order to perform (Shaw, 1971). This put the decision maker in another context than in smaller entity. The important differences between a large and small firm is that the latter lacks resources and a buffer to handle negative outcomes. Small firms are less likely to engage in changes if they perform below the aspiration level, as they have fewer resources available to handle a negative outcome. Larger firms often enjoy slack resources, but have a more bureaucratic decision-making structure, leading their action of the decision makers more dependent on performance feedback effects. We therefore predict that the growth behavior of larger firms will be driven by performance relative to the aspiration level rather than by risk avoidance. This lead to our final two hypotheses:

Hypothesis 5: Growth triggered by performance relative to an aspiration level will increase with size.

Hypothesis 6: With larger size, firms performing below their aspiration level will grow more rapidly than firms above their aspiration level.

METHOD

Data
We analyze the full population of incorporated firm that are founded in Sweden’s knowledge-intensive sectors between 1995 and 2002. The panel was assembled by Statistics Sweden, i.e. the official Bureau of Census. The data was supplemented with full balance sheet statements from the tax authorities. Financial data for new unlisted firms are normally difficult to find since organizational decision makers are reluctant to share this information outside their firms. This is an important advantage in our data as financial data is prerequisite to test models of aspirations relative to financial performance. Our unit of analysis is the individual firm with more than one employee, active in an industry defined as knowledge-intensive by the Bureau of Census. The data consists of 23,286 new firms.

Modeling Growth

The lack of convergent measures of growth is one reason that research on growth has failed to generate a distinct body of knowledge (Delmar, 1997). To ensure comparability with similar studies, we follow the same procedure as Greve’s recent (2006, pp. 20-21) study on behavioral theory and the growth of incumbent firms. Here, firm growth is defined as the ratio of next-period and current-period size, and firm growth rate as the ratio minus one. This specification relies on the Gibrat’s law of size-independent growth, which assumes that firms have the same growth rate independent of size. It is extended with a coefficient “Epsilon” that lets growth be size-dependent. The resulting specification is a model that specifies the logarithm of the size at time t+1 as a linear function of the covariates and the logarithm of size at time t. The model contains the lagged dependent variable in order to account for size-dependence of the growth rate, i.e. it accounts for endogeneity in growth. However, as most new firm does not grow such a variable would lead to problems with multicolinearity with extremely large standard errors for our coefficients. To mitigate this problem we instead use the variable initial size (time invariant) together with the two additional variables total assets and total sales (time variant).

We choose to use random effects models despite the fact that a Hausman (1980) tests indicate that random effects are inconsistent (i.e. does not have a minimal asymptotic variance) and that fixed effects are preferable. We choose random effects models for two reasons: First, our theory specifies that firms can react to performance feedback either by searching for ways to grow, or to hold their size constant. Hence, using fixed effects in this case would eliminate all firms that never grow, while our theory holds that they might just be waiting for better conditions. Our second reason is that we believe that a number of features at the entry of the firms has long-lasting effects and will affect how firms grow. For example, mode of entry and entry size has been shown to have such effects. As these entry effects are time invariant they are eliminated from the analyses if we use fixed effects. However, as robustness check we re-ran all models also with fixed effects. The results were qualitatively the same.

Independent Variables and Hypothesis Tests

We adopt a very general performance measure, return on assets (ROA), as the basis for our aspiration-level variables. Several studies have shown that profitability strongly affects risk taking and the probability of strategic change, which subsequently affect profitability (Greve, 2006). Profitability is often tied directly to entrepreneurial incentives and directly affects founders’ ability to derive a livelihood from the firm. However, there are strong arguments that new firm are more interested in yielding a positive cash-flow than having a high financial returns, at least in early stages. We therefore tried using cash-flow as an alternative measure. However, we did not obtain stable results with the cash-flow measure. A reason could be that cash-flow is not a ratio, but an absolute value and that it was strongly affected by firm size, and therefore could not be separated out. As return on assets have been used more widely in the empirical literature and yielded more robust results, we opted for this measure.

Aspiration levels are shaped by two joint forces: the firm’s prior performance history and comparison with similar firms (Cyert & March, 1963). Performance history is generally calculated by measuring some
type of weighted moving average, where more weight is given to recent years (Greve, 2003; Levinthal & March, 1981). During their first year of operation, firms have no performance history to compare their current performance to, and are therefore dependent solely on social comparison to form an aspiration level. Since prior literature and preliminary analyses of our data indicated that social comparison make up the lion share of firm’s aspiration level, we calculated our aspiration level as a product of last years performance (weighted at 0.3) and the mean of the industry on return on asset (weighted 0.7) (Greve, 2003; Wennberg & Holmquist, 2006). Assigning larger weight for social aspiration levels is motivated by two characteristics of new entrepreneurial firms. First, history probably plays a minor role for our predominantly young firms: their goal is to become incumbent and develop capabilities that are equal or superior to the firms already in existence. Second, research on decision making under risk show that decision maker have a tendency to see problems as unique, isolated, and not related to a historical development (Kahneman & Lavello, 1993). It is therefore very plausible that new firms favor social comparison over historical comparison.

Our aspiration level variables are entered as spline functions, which mean that separate variables are entered for return on assets above or below a firm-specific aspiration level. This lets the variable have different effects above or below the level of aspiration as the hypotheses 1 and 2 predict. To ease interpretation of our variables, we reverse coded the variable denoting performance below the aspiration level following Baum et al. (2005). Hypothesis 1 is supported if the variable has a positive effect. Hypotheses 2, 4 and 6 are supported if the effect for performance above the aspiration level is weaker than the effects for performance below to the aspiration level, in the base (hypothesis 2) or the interaction variables for age (hypothesis 4) and size (hypothesis 6). An F test for equality of the two coefficients is used to test for statistical significance.

To test the hypotheses about age and size, interaction effects were constructed between the age variable and performance relative to the aspiration level, and between size and performance-aspiration. If age or size has increasing effects on risk taking, as hypotheses 3 and 5 predicts, we should expect the interaction effects to have opposite signs to the main effects.

Control Variables

To ensure that our findings are more than an artifact of variability in performance across firm’s evolution, we include a control variable for performance (ROA). We also include controls for age (in addition to the interaction variable), the log of yearly investments and the log of yearly total assets, if whether the firm is part of a company group. We also control for intangible resources by measuring the total number of patents taken by a firm, as well as the addition of new patents. Finally, we include the number of plants, cohort of entry, and dummies for manufacturing and service industries.

Correction for Selection

A problem with studying growth in new firms is that only firms that survive are measured, and many new firms do not survive. The coefficients on variables that have a significant effect on both survival and on firm growth will be biased downward in regressions predicting growth if only surviving firms are included, which introduced a systematic selection bias. The origin of the selection bias is that non-surviving firms are more likely to have lower values in the predictor variables. To correct for this problem, we used Lee’s (1983) generalization of the Heckman selection model to create a selection correction variable. By introducing the selection variable “Lambda” in all models, we achieve more precise estimates for growth.

RESULTS
Means, standard deviations and correlations for all variables are presented in table 1. While most correlations among the variables are low to moderate, we observe some high correlation (>0.60). Those are found among the correlations for aspiration levels and the interaction effects, and between the firm size indicators (assets and sales). Such levels of multicollinearity among explanatory variables leads to less precise but unbiased coefficients. That is, we increase the probability of type-1 errors (not finding a relationship when there is actually one) and significance levels are underestimated. Therefore, when constructing our models we used a hierarchical approach to check for consistency, introducing the independent variables in steps.

Table 2 displays the random-effect GLS regression estimates for our population of knowledge intensive firms and their propensity to grow. Model 1 is our base model with return on asset as a direct effect. Model 2 enters the positive and negative performance variables. Models 3 and 4 enter the interaction effects for age and size respectively. Model 5 is the complete model with the interaction effects where we test our hypotheses.

Some findings on the control variable are mentionable. Most importantly, the control variable for performance (ROA) in the base model is not significant. Since, as we will see, the variables for performance minus firms’ specific aspiration levels are all significant, this demonstrates that performance-feedback effects are indeed present and the findings are not only an artifact of variability in performance per se. In regards to the other control variables, we find that age has a negative direct relationship with growth. Logged entry size, logged investments, being part of a company group and logged total assets have coefficients that are positive suggesting that initial resources and slack resources are important for growth. The coefficient for our selection variable is also significant across all models. Firms that are started in manufacturing industries, and in industries where patents are important, grow more.

In support of hypothesis 1, we find that the coefficient for performance below the aspiration is negative (-0.78, p<.001), indicating that growth decreases as performance falls, under the aspiration level. This provides support for the threat rigidity theory over the performance feedback theory for the growth of newly started firms.

We also find support for hypothesis 2, in that performance above the aspiration level has a weaker effect on growth than performance below the aspiration level. Remember that in order to support for hypothesis 2, the coefficient must be significantly smaller than the coefficient for performance below the aspiration level. The coefficient is also negative (-0.16, p<.001), but it is significantly smaller than the coefficient for performance below the aspiration level (F-test: 24.12, p<.001). The result indicates that performing below the aspiration level has a strong negative effect on growth, but performing above does not automatically lead to increased growth. Even if the coefficient for the later is much weaker, it remains negative. This contradict organizational learning theory, but gives support to a threat rigidity and survival focus argument emphasizing the importance decision makers in new firms attach to negative performance feedback.

Hypothesis 3 examines the effects of age on the growth triggered by performance feedback. Hypothesis 4 examines the interaction effects between age and performance, above or below the aspiration level. Looking at these coefficients in model three, they indicate that as firms age, they alter their performance feedback behavior. Instead of focusing on survival as in the base model, the interaction variable show that older firms focus on growth when performance falls below the aspiration level. However, the interaction variable also augments the result of the base model. This is not uncommon in models with interaction variables, and highlights the importance of testing for significance for the main effects variables also in models that include the interaction variable(s) (Aiken & West, 1991). It is also clear that the coefficients for the age interactions are significantly smaller than the coefficients for the direct effects. In addition to supporting hypothesis 3, model 3 also gives evidence against hypothesis 4:
firms performing above the aspiration seem to grow more rapidly than firms performing below the aspiration level. Looking at the full model 5 with all the interaction variables intriguingly alters the result: Hypothesis 3 is now rejected but hypothesis 4 is accepted. The reason is that the interaction variable for size clearly dominates over the interaction variable for age. We therefore turn to investigate the role of size for aspiration-level performance and firm growth.

Hypothesis 5 tests the effect of size on growth. We find clear and strong support that with increasing firm size, risk taking and growth increases. That is, with a larger size, risk taking increases when performance falls below the aspiration level. Similarly, the interaction effect for performance below the aspiration level with size is larger than the direct effect for performance above the aspiration level. That is, risk taking increases with size. This indicates that entrepreneurial firms with a larger size are not guided by threat rigidity as was indicated in the direct effects models, but rather according to the performance feedback behavior suggested by the behavioral theory of the firm and prospect theory. We also find support for Hypothesis 6 stating that with increasing firm size, firms performing below the aspiration level (94.91, p<.001) are more likely to engage in growth than firms performing above the aspiration level (20.30, p<.001; F-test of difference between the coefficients: 54.42, p<.001). These findings are akin to those of Greve (1998) in the U.S. radio broadcast industry.

To sum up, all our hypotheses except for hypothesis 3 were supported. Clearly, the evolution of firms in terms of age and size has large effects for how they react to performance feedback. However, a consistent finding throughout all models is that performance below the aspiration level is a stronger trigger for organizational growth or decline than performance above the aspiration level. This is consistent with prior research in organizational learning and decision making under risk. We will now discussion our findings in the light of these theories.

**DISCUSSION**

This study tells a story about variable risk preferences and the growth of new firms. Taken together, our findings indicate that firms respond differently to performance feedback depending on the evolution of the firm. Initially, the growth of small entrepreneurial firms is characterized by threat rigidity rather than the performance feedback pattern suggested by the behavioral theory of the firm. However, as the age and in particular as they grow, their performance feedback pattern changes to that suggested by the behavioral theory of the firm as well as prospect theory.

In this way, the age and especially the size of a firm clearly are crucial determinants of firms’ risk behavior. One likely explanation for this evolutionary pattern of variable risk preferences is that firm growth affects the decision-making procedure and goal processes of the firm, and therefore also how the firm reacts to performance feedback (Nelson & Winter, 1982). Another explanation is that larger firms often have a more dispersed ownership and management structure, leading to conflicts between ‘dominant’ and ‘subordinate’ coalitions of decision makers within the firm (Cyert & March, 1963).

The purpose of this study was to examine the conditions under which new firms engage in growth. This was done from the perspective of organizational learning theory, suggesting that decision makers initiate changes in organizational structure depending on performance relative to a level of aspiration. Specifically, we suggested that as firm grow and age, the risk behavior of their decision makers will change. Their willingness to take the risk of engaging in growth actually increases with age and size, but the performance feedback pattern stays the same in that performance below the aspiration level is a stronger trigger for organizational growth or decline than performance above the aspiration level.

Our analysis of the role of performance-feedback in the growth of new firms was made on the population of all incorporated new firms entering the Swedish knowledge intensive sector between 1995 and 2002. The results gave partial support to our hypotheses. We found that new firms in general tended
to react strongly to performance below the aspiration level. Our interpretation is that the larger the gap is
the less willing the decision makers are to continue to invest in the new firm. In addition, positive
feedback did not automatically lead to growth. However, we found that with introducing the interaction
variables for age and size, risk increased symmetrically, i.e., the interaction effects for performance above
or below the aspiration level were relatively larger compared to that of their respective direct effects. This
finding indicates that at some point during their evolution, new firms’ change focus from survival
orientation to growth orientation. A plausible explanation is that with increasing size, demand on decision
makers change, as do the goal formulation process within their firm. Growing their firm also reinforce
decision makers confidence in their management capabilities, which increase their willingness to take
large risk. Heath and Tversky (1991) have shown that decision makers who consider themselves experts
in an area, attribute success to knowledge and failure to chance more often than novel decision makers
(Heath & Tversky, 1991, pp. 7-8). We also found that, as expected, with increasing size, firms performing
below the aspiration level were more likely to expand than firms performing above the aspiration level.

Our general results show that decision makers in new firms are clearly sensitive to feedback when
engaging in the risky decision to grow. They form aspiration levels that are based on both social and
historical comparisons, and whether or not they are above or below these goals have strong effects on
their subsequent growth behavior. The main findings are that performance feedback is a deterrent to firm
growth for really small firms, but that there exist important interaction effects with age and in particular
with size. It seems that smaller firms are more likely not to respond to feedback if it is positive, perhaps
because they have less formalized goal decision processes. This behavior change during the evolution of
the new firms, i.e. as they age and grow. Our study offers contributions to the literatures on new firm
growth and organizational learning. The results highlight important differences in how firms at different
stages of development behave in facing risk. In their early life stage, new firms reaction to performance
feedback is characterized by threat rigidity and seem to have a focus on survival rather than the pursuit of
opportunities, which runs counter to much of the entrepreneurship literature but is consistent with the
survival focus hypothesis presented by March and Shapira (1992). While the very new firms seem to have
a focus on survival, slightly larger firms grow according to the goal-attentive behavioral suggested by
behavioral theories of firm evolution. To some extent, older firms act more rigidly by not reacting very
much to either positive or negative feedback.

Our empirical findings are consistent with the threat rigidity argument and to the arguments in the
behavioral theory of the firm that describes larger firms as more bureaucratic, with developed control
systems and with problemistic orientation triggered by performance relative aspiration level (Cyert &
March, 1963). Conversely, the small new firms that we investigated are more clearly survival oriented
and seem to focus on negative feedback to minimize possible losses, would they have invested in a poor
opportunity. Entrepreneurs react especially strongly to negative feedback, and consequently they tend to
be risk sensitive when performing below the aspiration level. In line with the behavioral theory of the
firm, this risk behavior changes with organizational complexity. Risk taking increases more when
performance is below the aspiration level than when performance is above the aspiration level. This
follows the predictions of both prospect theory and the behavioral theory of the firm.

We believe that the findings from this paper inform three streams of literature. Our findings should be
of interesting to researchers adopting an evolutionary perspective on organizational decision-making and
growth; we show clearly that age and size have different effect on risk taking. With age, risk taking
decreases, and with size, risk taking increases. Our study suggests that as originally stated in the
behavioral theory of firm: very small firm act differently than somewhat larger firms. Goal setting in
small firm is easier as they are defined as the goals of the entrepreneurs. In large firms, even if they are
new, the goal formulation process is altered. This changes how goals are determined, which also influences
risk taking and subsequent growth. When firm starts and are small, they vigorously seeks to receive
feedback. The more negative the feedback is compared to aspiration goals, the more reluctant are decision
makers to invest in growth. This is however only valid when firms are very small and young. Thereafter,
decision makers, as just indicated, act accordingly to prospect theory, and become more risk willing (e.g. engage in growth) when they perform below their aspiration level. Finally, our study offers a theoretical lens through which to view the dispersed literature on firm growth, suggesting an explanation based on goal setting and financial performance feedback to why decision makers in new firms engage in growth, and why they stop growing. Decision makers pay close attention to financial feedback when evaluating whether or not they are going to engage in firm growth. This is a contribution to a literature that has mostly focused on motivation and strategic orientation as explanations for growth.

This study has a number of limitations that could undermine the validity of our results. Even if our data are unique in the sense that we are dealing with a very rich data set of a multi industry population followed over a period of 8 years, our variables and analyses could be additionally developed. It is possible that risk behavior varies between industries beyond that by which we have controlled for. Some industries can be characterized as long shoot industries having a low probability of success but with a few very high outcomes. Industries with extensive barriers to entry would be an example. Here, a successful outcome often means the appropriation of economic rents. Other industries can be characterized as short shot industries having a moderately high probability of success but low outcomes. An example of such industry would be management consulting or other knowledge intensive service industries, where there is a strong limit to how much income can be made as sales and returns are dictated by the number of billing hours at a comparable price across competitors. Lopes (1997) suggest that such variable performance distributions are likely to affect risk behavior. Decision makers entering long shoot industries (low probability, but high outcomes) would be more risk seeking than those choosing short shot industries (higher probabilities, but lower outcomes). Further research could conduct more fine-grained analysis looking at industry with different risk distributions. Another limitation is that we set a static aspiration level with fixed shares of historical and social comparison (with the exception of the first year). It is possible that aspiration levels are more dynamic in their nature (Baum et, 2005; Lopes, 1997). Future research should therefore try to unravel how decision makers in new firms develop their aspiration levels. Finally, we need to better understand exactly how the interaction effects function. For example, is there a threshold at which decision makers shift from an “entrepreneurial” learning mode to a more “managerial” oriented learning mode – or in other words, when does the “rational” entrepreneurial venture start functioning as a “boundedly rational” organization?

In summary, this study provides insights about how decision makers in new firms use feedback about financial performance to choose whether to engage in growth or not. The logic is that most firms enter as small entities, and set aspiration goals in risky environment with noisy feedback. If they are small, negative feedback will make them abstain from growth, and if they are able to achieve a certain size, or enter somewhat larger, negative feedback will instead trigger growth. We believe that adapting an organizational learning perspective on firm growth and other topics related to new firm evolution should be promising avenues for future studies.

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**REFERENCES**


Table 1: Variable Means and Correlation Matrix

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<th>Variable</th>
<th>Mean</th>
<th>S.D</th>
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<th>Max</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.905</td>
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<tr>
<td>3 Aspiration &gt; Performance</td>
<td>0.056</td>
<td>0.156</td>
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<td>4 Aspiration &lt; Performance</td>
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<td>0.045</td>
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<tr>
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<td>0.232</td>
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*Note: All correlations exceeding ±0.007 significant at the 5 percent level*
Table 2: Random effects GLS models on growth

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<th></th>
<th>Model 1</th>
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<td></td>
<td>Coef</td>
<td>(s. e.)</td>
<td>sign</td>
<td>Coef</td>
<td>(s. e.)</td>
<td>sign</td>
<td>Coef</td>
<td>(s. e.)</td>
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<td>Coef</td>
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<td>-0.162</td>
<td>(0.018)</td>
<td>***</td>
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<td>-10.049</td>
<td>(0.016)</td>
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<tr>
<td>Performance &gt; Aspiration x Age</td>
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<td>(0.064)</td>
<td>***</td>
<td>-10.725</td>
<td>(0.140)</td>
<td>***</td>
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<td>***</td>
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<td>(0.040)</td>
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<td>***</td>
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<td></td>
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<td>(0.019)</td>
<td>***</td>
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<td>(0.020)</td>
<td>***</td>
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<tr>
<td>Performance &gt; Aspiration x Size</td>
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<td>(0.044)</td>
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<td>90.936</td>
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<td>-0.027</td>
<td>(0.015)</td>
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<td>-0.177</td>
<td>(0.002)</td>
<td>***</td>
<td>-0.192</td>
<td>(0.003)</td>
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<tr>
<td>Age</td>
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<td>0.402</td>
<td>(0.003)</td>
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<td>(ln) Size at entry</td>
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<td>(0.001)</td>
<td>***</td>
<td>0.007</td>
<td>(0.001)</td>
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<td>0.008</td>
<td>(0.001)</td>
<td>***</td>
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<td>(ln) Assets</td>
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<tr>
<td>(ln) Investments</td>
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<td>(0.000)</td>
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<td>Cash Flow</td>
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<td>Number of plants</td>
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Note: t p < .10, * p < .05, ** p < .01, *** p < .001. All models include industry and cohort effects.