MUCH ADO ABOUT NEARLY NOTHING?
AN EXPLORATORY STUDY ON THE MYTH OF HIGH GROWTH TECHNOLOGY START-UP ENTREPRENEURSHIP

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MUCH ADO ABOUT NEARLY NOTHING? AN EXPLORATORY STUDY ON THE MYTH OF HIGH GROWTH TECHNOLOGY START-UP ENTREPRENEURSHIP

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ABSTRACT

This paper analyzes the relationship between growth and profitability of high growth high technology start-up firms. We focus on the role of strategic orientation, strategic plans, business plans, and the role of knowledge and skills of executive management and the boards with respect to firm performance. Results show that while high growth firms are indeed focused on growth these firms fail to translate an increase in revenues to profit. Nevertheless growth firms become profit oriented with increase age. In fact a firm’s growth orientation shows a significant negative correlation to profitability. Those firms showing a strong belief in that growth will lead to profitability and that growth is a prerequisite for profitability are the least profitable.

INTRODUCTION

Despite decades of academic research on firm growth and governmental efforts to create support mechanisms for new, innovative, and high technology ventures, sustained growth in such firms remains rare, if not totally elusive. Recent research has questioned some fundamental assumptions with respect to high growth entrepreneurship. There is convincing evidence that sustained growth may be nearly impossible to achieve (Headl & Kirchhoff, 2009; Davidsson et al. 2009; Brännback & Carsrud, 2008; Shane, 2008; Aldrich 1999; Reynolds & White, 1997). Despite this evidence, it is generally assumed that high technology firms have a greater potential of becoming high growth firms. It is also widely assumed that high growth firms are significant employers. In addition it is assumed that their period of initial high growth is followed by moderate growth or that rapid growth firms continue to grow fast and do not experience moderated growth. Finally it is assumed that the majority of growth firms are founded in growth industries and that firm growth is evidence of real value creation and capture.

In reality, a firm’s ability to create sustained profitable growth is a constant challenge of balancing a firm’s external environment against its internal resources. According to the resource-based view (RBV) of the firm (Wernerfelt, 1984; Barney, 1991, 1997) a firms’ ability to grow is driven by the firm’s internal resources. Barney (1997) argues that a firm’s sustained advantage is dependent on resources that are valuable, rare, inimitable, and organized (VRIO). “Organized” traditionally has been interpreted to imply an effective revenue model. In this study we have taken Barney’s explicit question with respect to ‘organized’ as our point of departure (1997, p. 145): “Is a firm organized to exploit the full competitive potential of its resources and capabilities?” This means going beyond just an effective revenue model to include: the strategy of the firm, whether it is profit or growth oriented; the importance of a business plan and a strategic plan; how often the strategic plan is revised; knowledge and skills of executive management, and an effective board of directors. According to the literature all of these factors are essential to firm performance.
However, most growth studies have primarily been conducted among rather established and publicly traded firms and surprisingly few have been conducted among high technology firms (Kiviluoto, Brännback, & Carsrud 2009; Carsrud, Brännback & Renko, 2008). Moreover, there is little agreement on what constitutes a high growth firm. Currently there seems to exist two definitions; firms with an annual growth in revenues of at least 20% for five consecutive years (Fisher & Reuber, 2003) and the other adopted by OECD: annual growth in revenues of at least 20% for three consecutive years, where firms have a minimum of 10 employees. In this study we have adopted the former as the latter is likely to not include start-up firms, because of the criteria of a minimum of 10 employees. Approximately 95 percent of all firms employ less than 10 people and any firm starting with 10 employees clearly does not represent a typical start-up. As we know, most firms start small and remain so (Aldrich, 1999; Shane, 2008).

External governmental support measures have been less than fruitful in generating high growth technology firms (Brännback & Carsrud 2008). We argue that rapidly growing new technology firms fall short in creating and capturing value by failing to create sustained and profitable growth due to their inability to effectively organize their internal resources. We assume that small high growth technology start-up firms have particular problems with organizing their resources as they usually lack routines and experience in the management of a new firm. We argue that the inability to create sustained profitable growth lies not just in an ineffective revenue model, but more importantly in taking an obsessive focus on growth thereby failing to create a profitable organization from the start. This is further amplified by an inexperienced management that fails to draw on the experience base of their boards or they do not have the right experience base (Renko, Carsrud, & Brännback, 2009; Carsrud, Brännback, & Renko 2008). In line with Barney (1997), an inability to organize resources thus will inhibit resources that are valuable, rare and inimitable (like technology) thus leading to competitive disadvantage with below normal economic performance. At best it can only yield a temporary competitive advantage with a temporary above normal economic performance – but not sustained growth and profitability (Porter, 2001).

**High-Growth Entrepreneurship**

Entrepreneurship is generally associated with growth and seen as the engine of economic development and private wealth creation (Schumpeter, 1934; Gartner, 1988; Low & MacMillan, 1988; Stevenson and Jarillo, 1990; Storey, 1994; Delmar, 1997; Dess, Lumpkin & Covin, 1997; Shane & Venkataraman, 2000). Some researchers even have argued that entrepreneurship is growth and vice versa (Davidsson, Delmar & Wiklund, 2002). Research even has shown that small start-up firms create the majority of net new jobs (Birch, 1987; Kirchhoff, 1994; Aldrich, 1999; Autio, 2007). While firm growth is generally considered good and important, it is, however, rare (Shane, 2003; Autio, 2007). Moreover, entrepreneurial growth is problematic as the phenomenon can be assessed and measured in many ways (Brush & Vanderwerf, 1992; Delmar, 1997; Fischer & Reuber, 2003; Davidsson et al. 2009; Kiviluoto et al. 2009; Shepherd & Wiklund, 2009). When measured in terms of employment (or any other dimension) however, the phenomenon remains very rare with fewer than 10 percent of firms growing at all during their lifetime (Reynolds & White 1997; Aldrich, 1999; Shane, 2003). Only 6.5 percent of start-up entrepreneurs expect to create more than 20 new jobs within five years and only 1.7 percent expect to grow beyond 100 employees (Autio, 2007) within five years.

High-growth firms are seen to differ from non high-growth firms in various ways, such as how they look on market expansion, how they more structurally organize their business, and experience and human capital of the founders (Gundry & Welsch, 2001; Friar & Meyer, 2003; Colombo & Grilli, 2009), suggesting that high-growth firms possess some unique characteristics that differ
them from other firms. Although studies focusing on the unique characteristics of high-growth firms and their founders help in understanding this specific type of entrepreneurship, they mostly lack in assessing the other side of the coin, namely profitability.

The Growth and Profitability Relationship

Research on the relationship between firm growth and profitability is extensive. A majority of policy makers and practitioners share the perception (also shown in most research) that growth is a precursor for firm profitability (Brännback & Carsrud 2008). However, research results are inconclusive (Shuman & Seeger, 1986; Hart, 1992; Gartner, 1997; Baum & Wally, 2003; Markman & Gartner, 2002; Davidsson et al. 2009). Moreover, most studies have been conducted using different growth and performance indicators making comparison difficult, if not impossible. Also, most studies have been conducted among rather large, established, and publicly traded firms (Kiviluoto et al. 2009). Research on start-up firms is rare with a few recent exceptions.

Recent research results show quite convincingly that profitability is a necessity for growth (Davidsson et al. 2009; Steffens, Davidsson & Fitzsimmons, 2009; Brännback et al. 2009). These studies used different methods of analyzing and samples across industries as well as within industries. The average age of the firms were approximately 7 years and according to Shane (2008) firms younger than 9 years should be treated as new. All three studies show that firms should focus on achieving profitability first. Those which show profitability first, have a higher probability to also become high growth firms. Those firms pursuing first and foremost high growth are highly unlikely to become profitable. These findings are also consistent with the strategy literature, e.g. Porter (1980, 2001), which shows that a focus on profitability ensures sustainable competitive advantage.

In addition to these recent research results a qualitative study investigating the perceptions among different stakeholders revealed additional insights (Kiviluoto, Brännback & Carsrud, 2010). Interviews were conducted among policy makers and investors. Results showed that the perception as to whether a firm should pursue growth or profitability first appears to be driven by the agenda of the stakeholder. Investors (not surprisingly) were first and foremost targeting as high as possible return on their investment via an IPO or merger/acquisition. To them, high growth is an indication of growth in valuation regardless of the profitability of the firm. In fact, profitability was not even interesting. The situation for the entrepreneur became awkward to say the least. The entrepreneur seeking funding complied with the investor’s goals and appeared to sacrifice his primary goal of creating a sustainable venture, yet struggling with the reality and necessity to create profit. Policy makers in turn are driven by their desire to support the creation of employment and their conviction that high growth is the solution to this; that all growth is good and that high growth will ultimately lead to financial success and thereby entrepreneurial success (Brännback & Carsrud 2008). Kiviluoto et al (2010) also showed that there are significant differences in the cognitive patterns between different entrepreneurs and non-entrepreneurs with respect to how they perceive the relationship between growth and profitability.

Earlier studies have also shown that firm performance is dependent on founding strategy (Feeer & Willard, 1990), strategic breadth and industry growth (McDugal et al. 1994), strategic planning and performance (Bracke, Keats & Pearson, 1988), strategic profiles and growth (Birley & Westhead, 1990), and strategic orientation (Durand, Bruyaka & Mangematin, 2008). In addition, recent research shows that industry growth is not linked to firm growth as previously assumed (Headd and Kirchhoff, 2009).
Building on research results from Davidsson et al. (2009), Steffens et al. (2009), Brännback et al (2009) and Kiviluoto et al (2010) the focus of this study is high growth and high technology start-up firms. The challenge with this study is to identify high growth start-up firms as the phenomena is very rare (Shane, 2008). Moreover, Barney (1997) argues that a firm’s sustained advantage is dependent on resources that are valuable, rare, inimitable, and organized (VRIO). As noted earlier, “organized” traditionally has been interpreted as an effective revenue model (Davidsson et al. 2009). While this may hold for more established firms this is problematic for most start up firms as the entire start-up process may be considered an acid test for how effective that revenue model in reality is. Brännback et al (2009) revealed that it appears to be difficult for firms to alter their business model once established.

We argue that in order to conceptualize ‘organized’ we also have to include the strategic orientation of the firm, i.e. does the firm have a growth oriented or profit oriented strategy. Given the nature of a start-up firm it is necessary to understand if the firm has a business plan and a strategic plan and how often these are revised. Additionally, in traditional entrepreneurship literature it is argued that the knowledge and experience base of management and board of directors is essential to firm performance. Finally, we seek to reveal whether the perceived importance of growth also impacts actual firm performance. We label this growth admiration, i.e. management perceives growth as good, as a measure of an effective business model and that high growth will ultimately transfer into profitability.

DATA AND METHODS

The data consist of two separate data sets, one of financial data and one of survey data (Davidsson, 2005). The financial data was extracted from Finnish commercial database called Voitto+, consisting of financial data for nearly 150,000 companies, including all private and public firms. Only high-technology firms were extracted using the five-digit NACE code (62010 - computer programming activities, 62020 - Computer consultancy activities, 72191 - research and development on medical sciences, 72110 - Research and experimental development on biotechnology). Hence in two sectors of high technology; biotechnology and IT, a total of 4296 firms were identified. Out of these only firms founded between 1996 and 2004 were chosen, reducing the sample to a total of 1699 firms. For these firms full financial statements were extracted.

Growth is measured in terms of relative sales growth, which is by far the most common performance measure in entrepreneurship research (Kiviluoto et al. 2009). Profitability is measured in terms of operating profits (Brännback et al. 2009). All measures are available from 2003 to 2008. The use of only two performance measures is justified to ensure comparison with recent research results (Brännback et al. 2009; Davidsson et al. 2009; Kiviluoto et al. 2009; Steffens et al. 2009), although in contrast with recommendations of Devinney et al (2009).

High-growth can be measured in various ways and the results of a study may be dependent on the measures used (Delmar. Davidsson & Gartner, 2003). In conceptualizing high-growth we did not use the OECD definition of a high-growth firm, i.e. a firm with 20% sales growth for three consecutive years, with a minimum of 10 employees at the beginning of the measurement period. This definition was not used because (i) this study focus on start-up firms, and (ii) 10 employees is not the size of a typical start-up. In fact, 95% of all firms in Finland employ less than 10 persons. Moreover, in the sample of 1699 firms only 11 firms met the OECD criteria, representing only 0.65 % of the firms. We used the Fischer and Reuber (2003) definition of a high-growth firm as a
one with a 20% growth for five consecutive years. This conceptualization gave a sample of 25 firms (1.5%). This does indeed show that we study a very rare phenomenon.

Out of the sample of 1699 firms, only firms founded 1998 and 2001 were included in our survey. This further reduced the sample to 368 firms and once firms with incomplete financial data were removed, the sample consisted of 226 firms. Contact details for top management, in the form of e-mail addresses, were manually collected from the firm’s website and publicly available directories. The sample was reduced by unavailable or incorrect contact details, which gave us a final sample of 158 firms, which were included in the final survey. Thus we had two groups of firms – those founded in 1998 and those founded in 2001. Financial data from these firms was analyzed for the years 2003-2008.

In order to minimize the possible respondent errors in the collected data, the survey was done electronically with Webropol software. The survey was made in English, and after sending it for the first time, two reminders were sent, each after one week’s time. In total 34 responses were received, representing a moderate 21.5% response rate (Table 1). Only two of these firms are biotechnology firms, and hence cross-industry comparisons cannot be made. Identification details of the firms were saved, so that the survey data could be combined with the previously collected financial data. Results were analyzed using correlations, variance, and t-tests analysis.

RESULTS AND DISCUSSION

The firms in our sample are performing better in terms of growth and profits than the industry in general. The average growth rate for our sample is 32.3% over a six years period (Table 2). Figure 1 shows the adjusted mean performance measures both for our sample and for the entire population of firms founded 1998 and 2001. However, the results are still problematic as shown in Table 3. The correlations matrix of the total sum of the turnover change and EBIT between 2003 and 2008 show a strong negative correlation of -0.636. The low profit rates show that the firms have problems with generating profits from their very strong growth in turnover. The situation is somewhat similar as in the rest of the industry, but not quite as apparent.

Growth and Profitability Orientation

An independent samples t-test was conducted to compare growth and profit orientation scores between firms founded in 1998 and firms founded in 2001. There was no significant difference in scores for growth orientation for firms founded in 1998 (MD=4.92, SD=1.706) and firms founded in 2001 (MD=5.1, SD=1.729; t(32)= -0.28, p=0.778). Calculating the eta squared, shows that the magnitude of difference is very small (eta squared = 0.0025) (Cohen, 1988). However there was a strong significant difference between the scores for profit orientation and firms founded in 1998 (MD=6.38, SD=0.506) and firms founded in 2001 (MD=5.1, SD=1.578; t(26)=3.47, p=0.002). A calculated eta squared of 0.273 shows a large magnitude of difference, i.e. 27.3% of the variance in profit orientation is explained by firm age.

The same test was conducted to compare differences in growth and profitability orientation between high-growth and other firms. There was no significant difference for profit orientation for high-growth (MD=5.4, SD=1.72) and other firms (MD=5.74, SD=1.15; t(23.3)= -0.651, p=0.52). However, as expected there was a significant difference in the means at a 90 % level for growth orientation for high-growth firms (MD=5.6, SD=1.5) and other firms (MD=4.58, SD=1.74; t(32)=1.8, p=0.076. The magnitude of difference in moderate, with an eta squared of 0.09.
These results indicate that start-up firms start with a more growth-oriented strategy, and see profitability as an issue to address later on. These entrepreneurs have a necessity to grow, despite the consequences on profitability. This can be due to that they start with a necessity to grow, simply because it is a way to attract investors (Kiiviluoto et al. 2010), or because it is believed that it will eventually lead to profitability. Older firms have perhaps learned from their mistakes and realized that high-growth does not necessarily translate into high profits, and hence become more profit oriented later on. However, only the orientation does not tell the entire truth, and hence it is important to see how a firm’s orientation and actual results are related (Table 4).

All performance measures were tested for normality using the Kolmogorov-Smirnov test. As all measures were significant (p=0.000), indicating that results were not normally distributed, a non-parametric test (Spearman’s rank order correlation) was chosen. The correlation coefficients show that profit orientation is negatively correlated towards net revenue (r=-0.015), but positively correlated towards relative revenue change (r=0.223). Profit orientation correlated towards profit both in absolute and relative terms; net operating result (r = -0.024) and ebit (r=0.044). Growth orientation is positively correlated towards growth and negatively towards profit, both in absolute and relative terms. A positive correlation (r=0.273) is found towards absolute revenue growth and a significant (p=0.015) correlation towards growth in relative terms (r=0.412). Negative correlations can be seen between net operating result (r = -0.165) and ebit (r= -0.276).

Profitability orientation does not have a clear correlation with actual performance, but growth orientation is positively towards achieved growth and negatively towards achieved profitability, both in terms of absolute and relative measures. It is worth asking, whether firms even see profit orientation as a strategy, or are profits the ends while growth acts as the mean to achieve that end. In other words, a growth oriented firm, might see itself as strategically oriented towards earning higher profits, but the way to achieve it, is through growth. Profit orientation is something that is used to define entrepreneurship, and hence ought to be in the focus of every firm (Davidsson et al. 2002). The reason why growth is something to strive for is because there seem to exist something that could be called growth admiration.

**Growth Admiration**

Growth admiration was measured with 6 items “The strategy of our firm is growth oriented”, “growth will eventually lead to profitability”, “a company in our industry must grow in order to become profitable”, “growth is a good measure of performance”, “growth is proof of a working business model” and “a company in our industry must grow in order to attractive to investors”, with a Cronbach α 0.814. Differences between the means for the items in the growth admiration scale were tested depending both on firm age and type of firm (high-growth and other). No significant differences were found among the items between firms founded in 1998 and firms founded 2001. When testing for differences between high-growth firms and other firm’s one significant difference was identified. High-growth firms (MD=5.4, SD=1.24) have significantly higher means for the consideration of growth being a good performance measure in comparison to other firms (MD=3.58, SD=1.77; t(31.6)=3.52, p=0.001). The magnitude of difference in very large, with a calculated eta squared of 0.28.

This result suggests that those firms that see growth as a good performance indicator are the ones that actually do achieve high growth. In order to examine this further this test was followed by one-way between groups analysis of variance (ANOVA) to explore the impact of actual achieved growth and profit on the different items. For this a total for 2003-2008 net revenue, and operating result, war calculated and then split into three groups, see Table 5.
The results show a significant difference between growth and two of the items: *growth being a good performance measure* \((F(2, 31)=4.06, p=0.027)\) and *growth being proof of a good business model* \((F(2,31)=2.779, p=0.078)\). The effect sizes were strong, with calculated eta squares of 0.27 and 0.152, respectively. Post-hoc comparison using Tukey HSD test indicated that for growth being proof of a good business model, the mean score for G1 \((MD=4.08, SD=1.44)\) was significantly different \((p=0.064)\) from G3 \((5.36, SD=0.924)\), while G2 \((MD=4.82, SD=1.47)\) was not significantly different from either G1 or G3. For growth being a good measure of performance, both G1 \((MD=3.83, SD=1.7, p=0.047)\) and G2 \((3.82, SD=2.0, p=0.05)\) differed from G3 \((MD=5.55, SD=1.04)\), while there was no significant difference between G1 and G2.

When comparing scores towards profit, also two significant differences were indentified, namely for the assumption that *growth will eventually lead to profitability* \((F(2, 31)=4.4, p=0.21)\) and *that a firm must grow to profit* \((F(2, 31)=4.46, p=0.02)\). The effect sizes were very strong, with calculated eta squares of 0.22 and 0.223, respectively. Post-hoc comparison using Tukey HSD indicated that for the question of growth eventually leading to profitability, the mean scores of both P1 \((MD=5.0, SD=1.8, p=0.086)\) P2 \((MD=5.45, SD=1.07, p=0.021)\) significantly differs from P3 \((MD=3.55, SD=1.75)\), while there is not a significant difference between P1 and P2. For the question of that a firm must grow in order to profit, the post-hoc comparison using Tukey indicated a significant difference in the mean scores for P1 \((MD=4.75, SD=2.18)\) and P2 \((MD=5.09, SD=1.47)\) in comparison with P3 \((MD=3.09, SD=1.85)\).

These results suggest that those firms that pursue growth because they see it as a good measure of performance and proof of a working business model do in fact manage to create larger revenues. On the contrary, those firms that think growth will eventually lead to profitability and that a firm must grow to profit (something that could be called the growth illusion) are in fact the least profitable firms. These firms seem to be operating under some sort of growth illusions, believing that growth will eventually turn to profitability, while firms that do not agree with the statements do significantly better in financial terms. For all statements the relationships are positively linear i.e. the more you agree with the statement, the larger the effect on the financial measure will be.

**Business Planning and Strategic Planning**

A total of 31 firms in the sample (91.2%) indicated that they have a business plan and a total of 32 firms (94.1 %) indicated that they have a strategic plan. We were interested to find out whether there is a difference in how often these plans are revised, depending on the age of the firm and whether you are a high-growth firm or not. Questions were asked on a 7-point scale, each with a 6 month interval, where 1 = 0 to 6 months and 7 = more than 36 months.

An independent samples t-test was conducted to compare scores for business plan revision and strategic plan revision. No significant differences are found between revision of the business plan and firms founded in 1998 \((MD=2.33, SD=1.67)\) and firms founded in 2001 \((MD=2.5, SD=1.64; \ t(30)=-0.277, p=0.784)\). The magnitude of difference is very small, eta squared 0.003 (Cohen, 1988). Neither are there significant differences between the revision of the strategic plan and firms founded in 1998 \((MD=1.92, SD=0.95)\) and firms founded in 2001 \((MD=2.11, SD=1.68; \ t(29)=-0.36, p=0.719)\). The magnitude of difference is very small, eta squared 0.004 (Cohen, 1988).

When comparing scores between growth firms and other firms, no significant differences can be found between the revision of the business plan and growth firms \((MD=2.0, SD=1.24)\) and
other firms (MD=2.78, SD=1.83; t(30)=-1.36, p=0.18), with an eta squared of 0.06, the magnitude of difference was moderate. There was, however, a significant difference in the scores for strategic plan revision for growth firms (MD=1.36, SD=0.5) and other firms (MD=2.6, SD=1.66; t(19.4)=-2.9, p=0.009), eta squared of 0.19 and strong difference.

The results show that when comparing firm age, business and strategic plans are indeed revised quite regularly, with most firms revising these plans every 12 to 18 months. Strategic plans are revised somewhat more often that business plans, on average around once a year. Growth firms revise both their business and significantly more often their strategic plans than other firms. The strategic plans are revised almost every 0 to 6 months. However, what role the strategic plan has on firm profitability is unclear. When exploring the relationship with the Spearman rank order correlation, small and medium negative correlations are found between absolute and relative growth measures, with a significant negative correlation (p= -0.421) between the revision of the strategic plan and relative growth. Very weak correlation, all below r=0.07 can identified between absolute and relative profits and the revision of plans. However, by using t-tests and ANOVA, no significant differences are found between the revision of either the business plan or the strategic plan and actual results.

These results only show that start-up growth firms face a reality where plans constantly have to be revised, either for purposes of seeking yet more funding, unrealistic previous plans, or having achieved the goals of the original plan. Depending solely on correlations is not sufficient to determine whether the planning activities have an impact on the firm’s financial performance.

**Board and Firm Experience**

An independent samples t-test was conducted to compare the mean scores of the items in the board experience scale between high-growth firms and other firms. High growth firms differ significantly from other firms on two dimensions (i) their firm have experience in raising finance; high-growth (MD=5.53, SD=0.915) and other firms (MD=4.47, SD=1.5; t(30.3)= 2.53, p=0.017, with an eta squared of 0.144, and (ii) board of directors experience with management of growth companies; high-growth firms (MD=4.8, SD=1.9) and other firms (MD=3.58, SD=1.35; t(32)=2.195, p=0.035), with an eta squared of 0.131. Interestingly, technology skills, marketing skills, legal expertise, skills often cited in the entrepreneurship literature as important for venture creation and success does not differentiate high-growth firms from non-growth firms.

**CONCLUSIONS**

This paper really raises far more questions than what it provides an answer for, and it is really justified to ask: what do we really know about start-up growth and high-growth entrepreneurship?

First of all it must be stated that high-growth entrepreneurial firms are extremely rare (Shane, 2003; Autio, 2007). Using the OECD definition of a high-growth firm, our sample of 1699 firms is reduced to 11 firms. With the Fisher and Reuber (2003) definition our sample of high-growth firms would consist of 25 firms. As inappropriate performance measures impede the assessment of firm success and more thorough consideration should be made when deciding on what is good performance (Pearson, Bracker & White, 1990; Kiviluoto et al. 2009; Richard et al. 2009), one could question whether alternative measures, e.g. in terms of absolute figures or in terms of qualitative goals would be more appropriate when selecting the firms with high potential (Kiviluoto et al. 2010). In this study we chose to define high-growth in line with most of the
entrepreneurship literature and define high-growth firms with those having an average growth rate of 20% over three years.

What can we then say about high-growth entrepreneurship? Our sample consists of high technology high-growth firms, with an average adjusted growth rate of 23.5% over a five year period. Based purely on the financial data, it is evident that these firms manage to show impressive start-up growth. However, when looking at the other side of the coin, profitability, the financials tells a much darker story. With an adjusted EBIT over the same time period of 3.2%, and a significant negative correlation between the measures, shows that these firms are far from ‘organized’ internally to ensure that the increased incomes would translate into profits. They appear to fail to capture the value they create.

Our findings show that firms start with a growth oriented strategy and become significantly more profit oriented later on. The reason why firms start with a growth orientation, may be simply because that is a way to attract more finance (Kiviluoto et al. 2010), or because these firms are lead by some sort of growth illusion, believing that growth will eventually lead to profitability. Growth orientation has a positive relationship towards achieved growth, and a negative towards achieved profitability. The firms that believe the strongest that growth is proof of a working business model and that growth is a good measure of performance, does in fact manage to grow significantly more. On the contrary, those firms that believe that growth will eventually lead to profitability, and that a firm must grow in order to profit, are firms that actually make the least profit, suggesting a difference in the cognitive maps, and its effect of actual firm performance, of the entrepreneurs (Brännback & Carsrud, 2009). All firms in our sample revise their business and strategic plans relatively often, perhaps due to the fact that many do experience considerable growth. High-growth firms revise their strategic plans significantly more often than non high-growth firms, but the effects of these revisions cannot be answered with this study. In terms of experience inside the firm, and inside the board of directors, high-growth firms do not differ significantly in terms usually presented in the literature. High-growth firms differ from other firms in the way that they have significantly more experience in raising finance, and that their boards of directors have significantly more experience in the management of growth companies.

This study contains some limitations that may challenge the validity of the results. The most obvious is the problem of the sample size; a sample of 34 firms is enough for conducting more rigorous statistical analysis. Hence, the rigor of the results is affected by the necessity to concentrate on a limited number of measures. On the other hand the small sample size does reflect the rare phenomena.

This study has a unique selection of extensive financial data combined with survey data (Davidsson, 2005), which really allowed for an attempt to answer questions about high-growth entrepreneurship. However, it may be, that start-up firms are so heterogeneous, and are still very under-researched even in entrepreneurship literature (Kiviluoto et al. 2009), that the use of more qualitative methods may be justified. Perhaps entrepreneurship research should follow closer Glaser and Strauss’s (1967) point (in Tan et al (2009, p. 245): “…inductive research based on the analysis of qualitative data is critical to the creation of theories that credibly account for systematic variation in distinctive contexts.”

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REFERENCES


Table 1. Sample and Responses

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<td>158</td>
<td>34</td>
<td>21.5%</td>
</tr>
</tbody>
</table>

Table 2. Performance Measures of the Firms

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net turnover (€000)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>601.6</td>
<td>899.7</td>
<td>815.7</td>
<td>1267.7</td>
<td>1593.1</td>
<td>1726.5</td>
<td>1150.7</td>
</tr>
<tr>
<td>Mean 90%</td>
<td>529.0</td>
<td>804.5</td>
<td>651.9</td>
<td>1053.7</td>
<td>1333.1</td>
<td>1353.4</td>
<td>954.3</td>
</tr>
<tr>
<td>Std.dev.</td>
<td>847.0</td>
<td>1393.6</td>
<td>1472.8</td>
<td>2001.7</td>
<td>2590.0</td>
<td>3030.7</td>
<td>1889.3</td>
</tr>
<tr>
<td>Median</td>
<td>2071</td>
<td>267.4</td>
<td>281.0</td>
<td>495.9</td>
<td>580.0</td>
<td>611.5</td>
<td>407.1</td>
</tr>
<tr>
<td><strong>Turnover change (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>39.9</td>
<td>16.2</td>
<td>24.0</td>
<td>65.8</td>
<td>15.5</td>
<td>32.3</td>
<td></td>
</tr>
<tr>
<td>Mean 90%</td>
<td>33.0</td>
<td>16.2</td>
<td>14.7</td>
<td>39.8</td>
<td>13.9</td>
<td>23.5</td>
<td></td>
</tr>
<tr>
<td>Std.dev.</td>
<td>70.6</td>
<td>44.2</td>
<td>72.2</td>
<td>202.3</td>
<td>49.0</td>
<td>87.7</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>13.1</td>
<td>19.0</td>
<td>12.2</td>
<td>22.1</td>
<td>7.8</td>
<td>14.8</td>
<td></td>
</tr>
<tr>
<td><strong>EBIT (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.9</td>
<td>-9.4</td>
<td>-29.9</td>
<td>-17.8</td>
<td>0.2</td>
<td>-16.4</td>
<td>-12.4</td>
</tr>
<tr>
<td>Mean 90%</td>
<td>7.3</td>
<td>8.0</td>
<td>-2.8</td>
<td>5.4</td>
<td>5.9</td>
<td>-4.6</td>
<td>3.2</td>
</tr>
<tr>
<td>Std.dev.</td>
<td>60.8</td>
<td>114.2</td>
<td>179.3</td>
<td>151.1</td>
<td>151.1</td>
<td>105.5</td>
<td>112.2</td>
</tr>
<tr>
<td>Median</td>
<td>6.7</td>
<td>9.1</td>
<td>4.6</td>
<td>7.8</td>
<td>9.8</td>
<td>6.3</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Figure 1. Performance Indicators (€000, mean: 90%) for Sample and Population
### Table 3. Correlation Matrix of Growth and Profitability

<table>
<thead>
<tr>
<th></th>
<th>EBIT 03-08</th>
<th>Turnover Change 03-08</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EBIT 03-08</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.636**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td><strong>Turnover Change 03-08</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.636**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>32</td>
<td>34</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

### Table 4. Correlations between Orientation and Financial Results

<table>
<thead>
<tr>
<th>Spearman's rho</th>
<th>Total net revenue 03-08</th>
<th>Total revenue change 03-08</th>
<th>Total operating result 03-08</th>
<th>EBIT 03-08</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Profit</strong></td>
<td>Correlation Coefficient</td>
<td>- .015</td>
<td>.223</td>
<td>- .024</td>
</tr>
<tr>
<td>Orientation Strategy</td>
<td>Sig. (2-tailed)</td>
<td>.931</td>
<td>.204</td>
<td>.892</td>
</tr>
<tr>
<td>N</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td><strong>Growth</strong></td>
<td>Correlation Coefficient</td>
<td>.273</td>
<td>.412*</td>
<td>- .165</td>
</tr>
<tr>
<td>Orientation Strategy</td>
<td>Sig. (2-tailed)</td>
<td>.118</td>
<td>.015</td>
<td>.351</td>
</tr>
<tr>
<td>N</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

### Table 5. Groups Based on Net Results

<table>
<thead>
<tr>
<th>Net revenue 03-08 (000)</th>
<th>Group name</th>
<th>Operating result 03-08 (000)</th>
<th>Group name</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=920.15€</td>
<td>G1</td>
<td>&lt;=30.30€</td>
<td>P1</td>
</tr>
<tr>
<td>920.11-5515.40€</td>
<td>G2</td>
<td>30.31-530.61€</td>
<td>P2</td>
</tr>
<tr>
<td>5515.41€&lt;</td>
<td>G3</td>
<td>530.61€&lt;</td>
<td>P3</td>
</tr>
</tbody>
</table>