Entrepreneurship Mgt (2006) 2: 93–109
DOI 10.1007/s11365-006-7091-x

Differentiating growing ventures from non-growth firms

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Abstract This is the first step of the studies examining which factors differentiate growing from the non-growth firms. Four hypothesis of new firm performance will be tested with logistic regression method. Venture growth, measured by the growth of turnover, will be explained by entrepreneurial characteristics and motivation, and interaction between the firm and environment. The longitudinal study concentrates on the 86 responses, half of these responses (43) were classified as growing and the other half as non-growth firms.

Personality characteristics and environmental factors do not explain the growth but experience, training and motivation are important variables that differentiate growing ventures from non-growth firms.

Keywords Growth · New firms · Entrepreneurial characteristics · Motivation

Introduction

This article aims to contribute to our understanding of how new firms achieve a continuous growth by analysing the effects of the factors involved in the start-up situation. The studied firms were drawn from a group of new firms which were studied in a project focusing on their development during 1990–97. Since the study consisted of firms with different performance characteristics, it was possible to compare the development of growing firms with those performing less strongly.

Much of the entrepreneurship literature is concerned with explaining the factors behind successful firms. Some studies have contrasted firms that grow rapidly with those that grow marginally. According to the study by Fisher et al. (1997) the factors involved in very rapid

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growth may contribute to our understanding of success in general. Second, since rapid-growth firms are often job creators, ensuring that they prosper rather than stumble in a spectacular manner is of considerable economic importance. One notable inquiry into the determinants of high growth versus marginal survival (Cooper et al., 1994) found that the chances of both survival and high growth were positively associated with having a higher level of education, greater industry-specific know-how, and larger initial financial resources. In another study that directly compared low-growth with high-growth firms, it was found that the range and intensity of business networks was markedly higher in the firms that grew rapidly (Zhao and Aram, 1995).

The growth of firms has been evaluated in terms of management and the development of new activities as well as the reformulation of a firm's problems and goals. However, several authors have noted that there is no single theory that can adequately explain new business growth (Gibb and Davies, 1990). According to Gibb and Davies (1990), previous studies on growth have included four main types of approach: the impact of the entrepreneur's personal characteristics, the strategic factors affecting the firm's performance, sectoral and broader market-led approaches and organisational development approaches (e.g. Smallbone et al., 1995).

In this study the sample firms were classified into two performance groups on the basis of their performance during 1990–97 (e.g. Smallbone et al., 1995). The main focus is on comparing the firms in the growth category with the other surviving companies and in studying relative growth of small new firms but not only the so called gazelles. These growing firms were identified on the basis of two criteria: (1) Rapid growth: i.e. more than doubling sales turnover (over 10% annual growth) in real terms over the 1990–97 period (1990 base accounting year beginning in month of start-up). (2) Significant size by 1997: i.e. reaching a minimum sales turnover of FIM 500 000.

The study should be interpreted with respect to the entrepreneurial activity and culture in Finland and in Europe. According to Global Entrepreneurship Monitor 2003 (GEM) total entrepreneurial activity rate (TEA) in Finland was 6.9%. This means that Finland ranks 15th among the 31 GEM countries. Finland's entrepreneurial activity rate was ranked as 5th among 17 European countries participating in GEM 2003 study. The majority of TEA rate in Finland consists of opportunity-driven entrepreneurship.

However, our longitudinal data is from the years 1990–1997, the period when Finland experienced a deep recession, and GEM was established in 1997 (Arenius et al., 2003). According to the results of the follow-up studies it seems that TEA in Finland has been increasing recently and thus connection between our results and results of GEM-studies should be interpreted carefully.

The remainder of this article is organised into the following four sections: (a) theoretical background and framework of the analysis and formulation of the hypotheses and theoretical models of the study: (b) a description of the data and research methodology: (c) research results and (d) conclusions.

Theoretical background and framework of the analysis

The purpose of this study was to investigate which differences between new growing and non-growth firms in the birth and start-up stage have had an effect on their growth (=moderate or high growth). The starting of a new business is defined as a progressive phase-by-phase process which leads to a specific business idea on the basis of which the firm is set up (Gartner, 1985; Bygrave and Hofer, 1991; Reynolds, 1995). The decision to found a firm is

seen to be based on either experimentation, self-confidence or planning. Entrepreneurship based on experimentation may start as a part-time activity in which the business idea is tested in practice (Lehti, 1990). In entrepreneurship based on self-confidence the founder of the firm has a strong belief in his/her own capacity to influence events and in the ability to translate his/her will into practical action (Timmons, 1976; Shapero and Sokol, 1982; Reynolds, 1992). Entrepreneurship based on planning accords most strongly with the process view (Krueger, 1993; Krueger and Carsrud, 1993; Krueger and Brazeal, 1994). If the establishment of a firm is seen as a process then the features of the entrepreneur's competence and internal motives alone are not enough to explain the decision to start a new business and the success of firms.

According to contingency theory, the start-up and growth of firms cannot be examined in isolation from their specific situation and environment (Gilad and Levine, 1986). The analysis of start-ups makes it possible, utilizing contingency theory, to evaluate the factors affecting the birth of new firms on a broader scale than allowed by the push and pull theory (Gilad and Levine, 1986; Storey, 1994) and including the founder's phase of life at start-up in the analysis. The various situational factors that describe the founder's phase of life at start-up can be seen as reflections of the overall situation of the economy, and these provide the link between founder's previous experience and the start-up situation (Littunen, 2000). In this study the situational entrepreneur specific factors are divided into following groups:

- The personality of an entrepreneur (McClelland, 1961; Rotter, 1966; Levenson, 1981),
- The significance of previous work and entrepreneurial experience for becoming an entrepreneur (employment approach) (Stuart and Abetti, 1990), the age of entrepreneur and the significance of vocational training.

Situational factors often link the success of new firms with particular kinds of entrepreneurial knowledge and skills (Cooper and Dunkelberg, 1987; Cooper and Gascon, 1992; Vesper, 1992; Ray, 1993). The contingency theory framework also links the environmental factors with various start-ups and with the situations preceding the start-up of the firm and thus introduces the features of the local environment in the analysis (Armstrong and Taylor, 1985; Storey, 1994; Isaksen, 1996; Spilling, 1996; Almus and Nerlinger, 1999).

Over the past twenty years, much research has been devoted to answering the question what factors explain new venture performance and growth. Chrisman, Bauerschmidt and Hofer (1999) proposed one widely referenced theoretical model of new venture performance. The model combined several potential explanatory factors that influence to the performance of a firm. Their extended model specified that the performance of a new venture was a consequence of a confluence of factors that encompass attributes of entrepreneurs, industry structure, business strategy, resources, and organizational structure, processes, and systems.

Our starting point is that the testing a wide model which includes tens of interrelated explanatory variables requires huge amount of data to avoid the problems with e.g. simultaneity and decreasing degrees of freedom. That is why, following the tradition in economics, the model should be tested piece by piece and forging the model based on those variables that have some explanatory power in differentiating growing firms from non-growth companies. However, because of the lack of space this demands the development of series of papers based on the same longitudinal data. In this paper we will test influence of entrepreneurial variables—i.e. personality characteristics, skills, experience and education and motivation—on growth of new ventures. The next step in the series of studies will be the inclusion of managerial behaviour and strategies on the analysis.

Even if it could be argued that studying links between entrepreneur's personality traits and firm growth performance is a path where new insight can hardly be found any more, we would like to point out that this kind of argument is based mostly on different definitions

of the concepts. For example, Shane and Venkataraman (2000) emphasizes the importance of the individual-opportunity nexus as the defining characteristic but their analysis about individual differences includes many of the characteristics —but not all of them—included in the need for achievement concept, too (c.f. Murray, 1938). Those characteristics Murray (1938) attached in his study of the psychological definition of the need for achievement concept have been widely addressed and applied as the characteristics of an entrepreneur in subsequent entrepreneurship studies. Thus we will follow the long and continuing tradition where the entrepreneur and entrepreneurial characteristics are important to the firm's creation and performance (McClelland, 1961; Evans and Leighton, 1990; Vesper, 1992; Ray, 1993; Storey, 1994).

The theories most commonly applied in research on entrepreneurship are McClelland's (1961) theory of the need for achievement, and Rotter's (1966) locus of control theory. According to McClelland's theory individuals who have a strong need for achievement are among those who want to solve problems themselves, set targets, and strive for these targets thorough their own efforts. The theory suggests that individuals with a strong need to achieve often find their way to entrepreneurship and succeed better than others.

Davidsson (1989) concludes that achievement motivation is the most important factor in explaining variation of growth rates and entrepreneurship. Shaver and Scott (1991) believe that achievement motivation is perhaps the only convincing personality variable associated with new venture creation. Shaver and Scott (1991) give a definition for the concept that was first developed by Murray (1938) who saw a need as a force "in the brain region". His definition includes several characteristics—internal locus of control, high risk-taking propensity, tolerance of ambiguity, high need for autonomy, dominance, and independence, the capacity for endurance or capability for intense effort, competitive mind, and learning—attributed to be essential for entrepreneurs (Sexton & Bowman, 1985; Low & MacMillan, 1988; Johnson, 1990; Amit et al., 1993; Virtanen, 1997).

According to Rotter (1966), the locus of control of an individual can be seen as either internal or external. An internal control expectation refers to the control over one's own life, where the results of actions are considered to be dependent either on one's own behaviour or permanent characteristics. According to Rotter's (1966) theory, the internal control expectation is related to learning and it motivates and supports active striving. The external control expectation, on the other hand, impedes learning and encourages passivity. An internal control expectation is usually associated with entrepreneurial characteristics.

In Levenson's (1981) application (=LASS) locus of control has three dimensions, which measure respectively an individual's belief in internal control, in control by others, or in control by chance, fate, etc. That is to say, for Levenson (1981), external control can be interpreted as two different dimensions. Control by other people can be seen as more predictable than, for example, that by chance, since a person has at least, the potential to affect it (Appendix A).

In spite of the numerous attempts to establish empirically the importance of entrepreneur's personality, the evidence has been inconclusive (Brockhaus, 1980). Brockhaus (1982) states that a causal link between ownership of a venture and the need for achievement has not been proven. However, he suggests that an internal locus of control, even if it fails to distinguish entrepreneurs, may serve to distinguish the *successful* entrepreneur *from* the *unsuccessful* one. On the basis of these theoretical starting points of need for achievement and locus of control issues our first theoretical hypothesis will test the entrepreneurial characteristics and skills of the entrepreneur as differentiating factors. On the basis of the slightly conflicting results of the former studies we set our first hypothesis as follows:

H1: Entrepreneur's personal characteristics differentiate the growing ventures from the non-growth firms.

The personality of an entrepreneur is measured by four different dimensions of achievement motivation. The entrepreneur's locus of control is measured by three different dimensions (Levenson, 1981); internal attributing, chance attributing, and powerful others.

Cooper et al. (1994) found a higher level of education and greater industry-specific know-how that could be interpreted as work experience, to be typical for successful and growing firms. Thus we use the entrepreneur's past work and entrepreneurial experience, the type of vocational training and the age of the entrepreneur as the measures of entrepreneur's skills.

According to contingency theory, the establishment of a firm and the success of firms cannot be examined separately from the context and environment (Gilad and Levine, 1986). In this study the entrepreneurial motives for founding a firm are divided into 'push' and 'pull' factors (Gilad and Levine, 1986; Storey, 1994). The model distinguishes those entrepreneurs motivated by a positive idea, those with specific knowledge of a market opportunity, and those primarily forced into entrepreneurship. The motivations of those attracted by the opportunity of perceived profit are in accordance with conventional economic theory. A "forced" motivation exists when the founder feels to be pushed into starting a firm under the pressure of circumstances. Individuals may be dissatisfied with their present jobs or promotion aspects or may also be faced with the prospect of unemployment. The 'pull' factors may also be psychological, like a desire to work independently or to realise own ambitions.

The founders of growing firms compared to those of other firms might have had different motives for setting up in business. They could have been forced into founding a firm or might have found a new business opportunity in the market. Thus the variable "Motives at start-up"(external push and pull factors, internal motives) was constructed to reveal the motives behind founding a business. Our second theoretical hypothesis tests the impact of the motives of the entrepreneur as differentiating factor of growth performance. The previous discussion could be condensed as hypothesis as follows:

H2: Pull factors as triggering motivation to start up a business, differentiate growing ventures from the non-growth companies.

In considering the birth of a new firm, the effect of its immediate surroundings is important since a significant share of births occurs within the entrepreneur's home district and business activities are often directed to the local market at the beginning. Armstrong and Taylor (1985) argue that the development and start-up of new firms is most likely to be successful in regions where (1) most of the firms in the region are small; (2) most of the employees have business managerial know-how; (3) the level of education in the region is high—especially the percentage of persons with high technical education; (4) the economic life of the region can be characterised as active; (5) the people living in the region have property that can be used as security for a loan; and (6) industry in the region is not restricted to lines of business where entering the market is difficult. Storey (1982) has shown that the most backward areas lack the features presented above. The production structure also affects the strategic choices of new firms. Owing to the influence of the local production structure, starting a new firm is often a question of reorganising existing business activities (Littunen, 1991).

According to Smallbone et al., (1993) and Storey (1994), there is a strong correlation between a firm's location and its growth, firms located in urban and remote rural areas of the United Kingdom being likely to grow less rapidly (Storey, 1994). However, it should be noticed that the impact of location on the growth of the firm in these studies is dependent on the measures of growth as well as on the time period selected. According to Storey and

Wynarczyk (1996), locality is of greater significance in explaining the survival/non-survival of young firms. Storey (1994) also found that geographical areas with high rates of new firm formation are those which have the highest death rates, too. Littunen et al., (1998) found that new firm closures in metal products manufacturers was higher in regions with high rates of new firm formation and in regions where the environment offered good opportunities for innovation and differentiation. A more developed production structure lowers market entry barriers with the consequence that individuals lacking entrepreneurial skills start firms more often in these than in other regions. On the other hand, Almus and Nerlinger (1999) found that location had only a minor influence on the growth of new technology-based firms (the factors of firm's environment explained in Appendix B). On the basis of these theoretical backgrounds the third theoretical hypothesis will be:

H3: Environment and location differentiate growing ventures from the non-growth companies.

In order to identify the interaction between the explanatory variables we will construct a model which includes all the variables tested in the above hypothesis. This model combines the situational factors of entrepreneur ($Es_{1...j}$), motives ($Em_{1...j}$) and environment ($ENV_{1...j}$) as explanatory variables for new venture growth ($NVG_{1...j}$) (Eq. (1)):

$$NVG_{1...j} = f(Es_{1...j}, Em_{1...j}, ENV_{1...j}) \quad (1)$$

We will set the fourth hypothesis about this interaction between the explanatory variables:

H4: Entrepreneur's personal characteristics, entrepreneurial motivation and environment and location together differentiate growing ventures from the non-growth companies.

On the basis of the analysis of the first hypothesis we also constructed the model where personality variables were excluded but other entrepreneur specific variables (skills of the entrepreneur, age etc.) were included.

In this paper the local environments are subregions, which are formed from two or more municipalities. The subregion is relevant to entrepreneurial activities because it usually corresponds to the area served by the market, labour market and co-operative network of small firms. The Finnish subregions have been classified into four categories according to their industrial structure (Pikkarainen, 1993). The four categories used here are based on Pikkarainen's original seven types as follows: (1) the capital area; (2) centres where service industries are dominant and centres where the industrial structure is highly versatile; (3) industrialised urban areas and rural areas where manufacturing is dominant; and (4) rural areas where service industries and/or primary production are dominant. Restricting the categories to four is necessary in order to carry out the regional examination with the data described above. This four-category solution can also be justified on the grounds that the characteristics of the grouped regions are similar (for statistical information on the regional categories, see Littunen et al., 1998).

Data and unit of analysis

This study is a part of a longitudinal research project which has followed the development of 200 SMEs in the branches of metal-based manufacturing and business services since their start-up in 1990 (Littunen, 1992). In that year the total number of SMEs established in these two sectors of industry in Finland was 2,583, which accounted for nearly 12% of the total number of firms in the two sectors.

These sectors were chosen because of their primacy among Finnish SMEs. Metal-based manufacturing is the most important of these sectors. The sampled firms in this category manufacture (a) metal products and machinery, (b) electronic and electrical equipment, and (c) vehicle machinery and equipment. Since the 1980s, the greatest volume and rate of small business growth in Finland has been in the information-intensive business services sector (Tervo and Niittykangas, 1994). The sampled business service firms came from the following areas: technical and engineering services, computer services, market research, legal consulting, and other professional and scientific services.

The study employed a stratified sampling technique where the strata were the firm's size and line of business. The selection of the strata resembled Neyman's allotment (Pahkinen and Lehtonen, 1989). Sampling from the different strata was done through simple random sampling, which requires that observations are weighted to correspond to the general population in the two sectors (N = 2,583).

The owner-managers were personally interviewed for the first time at the beginning of 1992. Follow-up data were collected annually through telephone interviews held between 1993 and 1996 and in 1998. In addition, each year the first author conducted 20–25 interviews personally in order to spot possible inaccuracies in the telephone interviews. For the first personal interviews, 200 firms were selected as subjects from the SME register of Statistics, Finland (Appendix C). Interviewers were recruited to carry out the fieldwork. They were given a half-day training session including written instructions on interviewing. The aim was to ensure the consistent interpretation of the questions used in the course of the interviews.

The sample consists of 138 metal-based manufacturing firms and 62 business service firms from all over Finland. At the four-year follow-up 134 firms continued to function, although for nine of these firms data for the measurement of growth was missing, 38 firms had closed down and 28 firms refused to participate in the two follow-up phases. After the fifth year of operations 128 firms were still trading. At the seven-year follow-up 86 firms had survived, 55 firms had closed down and 59 firms refused to participate in the follow-up. This study concentrates on the 86 survived firms where from 43 firms were discovered to be growing (average annual growth rate more than 10% in 1990–1997). About one third of the growing firms (14 firms) could be considered to be the so called gazelles whose annual growth was more than 25% per year. More than 65% of the growing firms in the sample were in metal-based manufacturing and about 35% were business service firms.

It should be noticed that the overall development of both branches of industry follows similar overall pattern but the growth of business service sector is from 1994 to 1997 larger and steadier than the growth of metal-based manufacturing. The production of both branches decreased in 1990–1993, the highest annual decrease being over one fourth in metal-based manufacturing sector. The drop down in the production of business service sector was a little bit less than 10% both in 1991 and 1992 and about 2% in 1993. The average annual growth of business service sector from the year 1990 to 1997 was about 5.5% and in metal-based manufacturing about 3%. Thus the annual growth in the both sectors is clearly less than 10% which is considered as a characteristic of a growing firm in this study.

The studied firms were mostly small: about 60 percent had less than five employees, and were often dependent on the entrepreneur's own labour and that of his/her family. This was of great importance for the implementation of the study. The connection between the firm and the entrepreneur was strong. The strategy of the firm was chosen by the entrepreneur. Over 45 percent of the entrepreneurs in the study had basic education no higher than elementary school. Empirical studies suggest that new entrepreneurs start their firms by relying on work experience gained earlier as employees in a firm owned by someone else. Most of the new entrepreneurs had come from SMEs, a fact which emphasises the firm's structure in the

start-up process. In most of the firms the selection of products was in the first place based on the entrepreneur's previous work experience. Other important factors affecting the choice of the firm's product were a combination of previous work experience, vocational training and identification of the needs of customers in the market.

The data were analysed by grouping the features of the respondents and their firms by means of cluster analysis. The aim of these groupings was to unify the rather varied interview data. Logistic regression analysis was used as statistical technique in locating differences between growing (growth of turnover more than 10% annually) and other firms and their owner-managers in the selected attributes. We chose logistic regression analysis because it captures synergistic relationships between variables but does require as restrictive assumptions as e.g. discriminant analysis. The purpose of the analysis is to find out those variables which differentiate growing ventures from the non-growth firms. The variables in the models are explained in the Appendix A and B. With logistic regression we also avoid one impediment identified by Davidsson and Wiklund (2000). They state that using current variables to predict past process breaks with the principle that the cause must precede the effect. By using logistic regression we do not explain the growth process but are trying to find out which factors differentiate growing firms from non-growth companies.

The reliability of the indicators describing entrepreneur's personality have been studied in the earlier studies of the other author (Littunen, 1992; Littunen and Storhammar, 2000). The reliability values of the indicators (=four items) vary around 0.50, which Nunally (1978) considers as being the lower limit of acceptability. Perhaps one reason for the low reliability values of personality sum variables (work ethic, dominance, excellence, mastery, chance, external and internal) could be a small number of items in these scales (Churchill and Peter, 1984). Theoretically, the larger number of items in a scale, the more reliable will be the scale (Nunally, 1978).

Research results

In the first logistic regression model the entrepreneur's personality and skills of the entrepreneurs were tested (Table 1). The estimated model explained the location of the observations in the examined groups rather well. Out of all the observations 63.4% were classified correctly by logistic regression model. The high classification rate of the model was mostly based on the successful grouping of the growing firms (64.3%).

The age of the entrepreneur was the only variable that was discovered to be statistically significant ($p < 0.07$) suggesting that the old entrepreneurs were more often in growing firms. Thus the logistic regression did not provide support for the first hypothesis of the impact of personality and skills of the entrepreneur as explanatory variables for differentiating growing firms from the others. However, we need further information especially on the relationships between skills of the entrepreneur and the growth of the firm, because all these features are important for the entrepreneurial learning process (Gibb and Ritchie, 1982).

Table 2 presents a model describing growing and other firms, where growth of a firm is a function of motivation. The estimated model explained the location of the observations in the examined groups rather well. Out of all the observations 65.9% were classified correctly by the logistic regression model. However, it should be noticed that the partial rate of classification for growing firms was only 56.1% whereas the classification rate for other firms was substantially higher being 75.6%. Motives for establishing a firm were discovered to be statistically significant variables. In the growing firms positive situational and 'pull' factors such as business opportunities were more frequently cited as underlying motives for starting-up. Among the non-growth firms' owners, the motivating influences were more often

Table 1 A logistic regression model of entrepreneur specific situational factors (Dependent variable: other firms vs. growing firms)

Theoretical model $NVG_{1....j} = f(Es_{1...j})$ Variables	Model 1 Coefficient	Standard error	Significance
Work ethic	−0.646	0.444	0.146
Dominance	0.574	0.488	0.239
Excellence	−0.096	0.785	0.903
Mastery	0.038	0.576	0.948
Chance	−0.562	0.487	0.248
Internal	0.417	0.572	0.466
Powerful others	−0.101	0.498	0.840
Vocational training			0.844
Training (1)	0.476	0.817	0.561
Training (2)	0.279	0.683	0.682
Work experience			0.940
Experience (1)	−0.261	0.841	0.756
Experience (2)	−0.282	0.832	0.734
Entrepreneurial experience	0.033	0.562	0.953
Age			0.063*
Age (1)	0.094	0.974	0.923
Age (2)	−1.227	0.579	0.034*
Constant	1.791	4.907	0.715
Model of Chi-square = 0.519	Partial classification rates		
Df = 15			
Total classification rates (%) = 63.4	non-growth (%) = 62.5	Growth (%) = 64.3	
* $p < 0.07$			

Table 2 A logistic regression model of entrepreneurial motivation and environment (Dependent variable: Other firms vs. growing firms)

Theoretical model $f(NVG_{1...j} = Em_{1...j})$ Variables	Model 2 Coefficient	Standard error	Significance
Motive			0.014*
Motive (1)	1.208	0.545	0.027*
Motive (2)	−0.387	0.602	0.520
Constant	−0.375	0.392	0.339
Model of Chi-square = 0.01	Partial classification rates		
Df = 2	non-growth (%) = 75.6		
Total classification rates (%) = 65.9	Growth (%) = 56.1		
$p < 0.07$			

unemployment or fear of redundancy, and internal motives. The statistical analysis provided support for our second hypothesis and the viewpoint that the growth of a firm is a function entrepreneurial motivation factors.

According to the empirical results, new firms have equal possibilities for growth irrespective of locality (Almus and Nerlinger, 1999; Littunen and Tohmo, 2003). In the third model

Table 3 A logistic regression model of entrepreneur specific situational factors, entrepreneurial motivation and environment (Dependent variable: other firms vs. growing firms)

Theoretical model	Model 3			Model 4 (ni = not included)		
$f(Es_{1\ldots j}, Em_{1\ldots j}, ENV_{1\ldots j})$, Variables	Coeff.	S.E.	Signif.	Coeff.	S.E.	Signif.
Work ethic	−0.760	0.494	0.124	(ni)	(ni)	(ni)
Dominance	0.468	0.514	0.362	(ni)	(ni)	(ni)
Excellence	−0.396	0.884	0.655	(ni)	(ni)	(ni)
Mastery	0.165	0.655	0.801	(ni)	(ni)	(ni)
Chance	−0.446	0.569	0.433	(ni)	(ni)	(ni)
Internal	0.631	0.660	0.339	(ni)	(ni)	(ni)
Powerful others	−0.285	0.569	0.617	(ni)	(ni)	(ni)
Vocational training			0.515			0.160
Training (1)	1.012	0.924	0.273	1.479	0.828	0.074*
Training (2)	0.360	0.772	0.641	0.491	0.715	0.492
Work experience			0.911			0.759
Experience (1)	−0.207	0.927	0.824	−0.543	0.801	0.498
Experience (2)	−0.418	0.995	0.675	−0.601	0.871	0.490
Entrepreneurial Experience	0.385	0.630	0.542	0.236	0.579	0.683
Age			0.063*			0.147
Age (1)	0.003	1.085	0.998	0.253	0.979	0.796
Age (2)	−1.436	0.694	0.039*	−0.973	0.600	0.105
Motive			0.117			0.057*
Motive (1)	1.236	0.696	0.076*	1.153	0.633	0.069*
Motive (2)	−0.034	0.793	0.966	−0.304	0.714	0.671
Firm's location			0.654			0.716
Location (1)	−0.689	0.920	0.454	−0.506	0.857	0.555
Location (2)	−0.145	0.882	0.870	−0.093	0.825	0.911
Location (3)	0.485	1.018	0.634	0.445	0.941	0.636
Constant	2.407	5.828	0.680	−0.014	1.326	0.992
	Model of Chi-Square = 0.268			Model of Chi-Square = 0.213		
	Df = 19			Df = 12		
	Total classification rates (%) = 73.1			Total classification rates (%) = 70.5		
	$p < 0.08$			$p < 0.08$		
	Partial classification rates			Partial classification rates		
	Non-growth (%) = 73.7			Non-growth (%) = 65.8		
	Growth (%) = 72.5			Growth (%) = 75.0		

locality was tested as explanatory factor. Locality was not a statistically significant factor in the model describing the growth of new firms and thus the third hypothesis was not supported. The total classification rate was only slightly over 50% and the model of chi-square was 0.847. However, locality may play an important role in the *survival* of firms. Littunen et al.. 1998 found that closure was influenced by region and most commonly occurred in service centre regions. Typically those firms closed down during years 1–3, had shunted forward the problems that appeared in the start-up phase.

Table 3 presents two logistic regression models describing growth of a firm as function of characteristics of entrepreneur, entrepreneurial motivation and environmental factors. The first model in Table 3 includes personality variables of an entrepreneur (model 3) and the second is formed without these variables (model 4).

The estimated models explained the location of the observations in the examined groups rather well so that the total classification rate was 73.1% for the third model suggesting the interaction between explanatory variables. In the third model the partial classification rate for growing firms was 72.5% and for the non-growth firms 73.7%. However, the estimation results of the third model support only partially our fourth hypothesis since the personality variables of the entrepreneur were not statistically significant and thus we estimated the fourth model without these variables.

In the fourth model the total classification rate was 70.5% but it is noteworthy, that the fourth model classified growing firms a little bit better than the third model. In the fourth model the classification rate of growing firms was 75.0% and for the non-growth firms 65.8%. In addition, the model of chi-square statistics was smaller in the fourth model than in the third model (Table 3) and that is why it could be considered to be an appropriate model.

The age of the entrepreneur and motives for establishing a firm appeared to be statistically significant variables in the third model. The personality and skills of entrepreneur were not significant. On the other hand, in the fourth model also motives for establishing a firm were significant but furthermore growth was explained by the adequacy of the entrepreneur's commercial training. Thus, the entrepreneur's know-how could be linked with the success of the firm (Evans and Leighton, 1990; Cooper and Cascon, 1992; Storey and Wynarczyk, 1996).

Our statistical analysis has not provided support for the viewpoint that the growth of a firm is a function of the entrepreneur's characteristics and environmental factors together but according to this analysis we could set the hypothesis that learning by doing and entrepreneurial motivation differentiate growing firms from the non-growth firms. We could exclude entrepreneurial characteristics from the model without a loss of significant amount of explanatory power. Kazanjian's (1988) study of high-technology firms indicates that as a venture grows and develops, strategy continues to be critically important. In this paper we have not tested the impact of management behaviour and business strategy on the new firm performance but these variables will be included in the next phase of the series of the studies.

Conclusions

The purpose of this study was to examine the effects of the factors involved in the start-up situation on the subsequent growth of firms and what factors differentiate the growing firms from the non-growth companies. Elementary personal trait theories of entrepreneurship and contingency theory were used as the starting point in the study. First we tested the personal characteristics as explanatory variables and growth of the firm as a dependent variable. Thereafter the impact of entrepreneurial motivation and environmental factors were tested and finally the model of the combination of all these factors was constructed. This longitudinal

study concentrated on the 86 survived firms. One half (43 firms) of these firms where identified as growing firms (over 10% annual growth in turnover) and the other half was classified as non-growth firms.

Entrepreneurial characteristics as explanatory variables classified correctly 63.4% of observations. The only statistically significant variable in the first logistic regression model was the age of the entrepreneur implying that older entrepreneurs run more often the growing firm. Thus our first hypothesis that entrepreneurial characteristics differentiate growing firms from non-growth companies did not get support.

The second model proposed that among the growing firms' founders, the presence of positive situational and "pull" factors were important motivating and precipitating factors in the creation of a new business supporting our second hypothesis that entrepreneurial motivation differentiates growing firms from the non-growth companies so that growing firms are more opportunity driven (Shane and Venkataraman, 2000). Among the other firms' founders, the motivating influences were more often unemployment or fear of redundancy, and internal motives.

From the point of view of the contingency theory, the growth and start-up of a firm cannot be investigated without taking into consideration change in the environment and its features. The decision to start a firm is a decision to invest in which the features of the firm's local environment have an influence on the firm's strategies (Kazanjian, 1988; Storey, 1994; Chrisman et al., 1999). According to the results of this study, new firms have equal chances for growth independently of their locality. The firm's location was not significant factor in describing the growth of new firms. Thus the third hypothesis that environment and location differentiate growing firms from the non-growth companies was not supported. However, locality may play an important role in the survival of firms (Littunen et al. 1998).

The two combined models classified correctly over 70% of observations. Age of the entrepreneur, and motives for establishing were found to be the statistically significant variables in the third model. However, a study of the statistical significance of explanatory factors did not give unambiguous support for the fourth hypothesis of the interaction of the explanatory variables.

Higher level of commercial training was typical among the entrepreneurs of the growing firms in the fourth model where we had excluded personal trait variables. Thus, the entrepreneur's know-how was expected to have a more positive effect on the firm's growth than the entrepreneur's personality characteristics. Know-how is reflected in the characteristics of the firm's products and possibly in the execution of the activities connected with the growth of the firm (Evans and Leighton, 1990; Vesper, 1992; Ray, 1993; Storey, 1994). The results of Cooper et al. (1994) are parallel since they found that the chances of both survival and high growth were positively associated with having a higher level of education and greater industry-specific know-how. Motivation and environmental factors combined with the experience factor age of the entrepreneur, classify correctly about three fourth of the observations. Age of the entrepreneur will probably reflect the importance of learning by doing in the entrepreneurial process.

The results of our study suggest that experience (age), firm's location, motives at start-up situation, and vocational training as explanatory variables classify correctly over 70% of observations. Contrary to the extended model proposed by Chrisman et al. (1999) our analysis suggests that we could exclude the personality characteristics and environmental factors from the model. On the other hand, following the proposition of Cooper et al. (1994), skills, experience and education are such variables which should be included. Our next step in the series of studies will be to include management behaviour and business strategies in the model and possibly exclude personality and environmental variables.

Since this study was restricted to firms in two industries, caution must be exercised in generalising the results across other sectors. At the time the research was conducted the Finnish economy was in the middle of a recession, which undoubtedly affected the results. Finally, the background and aims of firms may vary according to line of business and regions. Future studies, conducted during a less turbulent time period and with bigger samples from a wider-range of industries and regions, would yield more conclusive findings.

Appendix A

Personality sum variables used in this study

Items of sum variables	Values of variable
Work ethic:	5-step scale
1. Hard work is something I like to avoid	
2. I can sit easily for a long time doing nothing	
3. I like to work hard	
4. I easily get bored if I don't have something to do	
Pursuit of excellence:	5-step scale
1. There is satisfaction in a job well done	
2. Part of the satisfaction in doing something comes from seing how good the finished product looks	
3. It is no use playing a game when you are playing with someone as good as yourself	
4. I find satisfaction in working as well as I can	
Mastery:	5-step scale
1. I prefer to work in situations that require a high level of skill	
2. I would rather learn easy fun games than difficult thought games	
3. I like to be busy all the time	
4. I feel like giving up quickly when things go wrong	
Dominance:	5-step scale
1. People take notice of what I say	
2. I think I am usually a leader in my group	
3. I think I would enjoy having authority over other people	
4. If given the chance I would make a good leader of people	
Chance:	5-step scale
I have often found that what is going to happen will happen	
2. To a great extent my life is controlled by accidental happenings	
3. Often there is no chance of protecting my personal interests from bad luck happenings	
4. It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune	
Internal:	5-step scale
1. I am usually able to protect my personal interests	
2. My life is determined by my own actions	
3. I can pretty much determine what will happen in my life	
4. When I make plans, I am almost to certain to make them work	
Powerful others:	5-step scale
1. Getting what I want requires pleasing those people above me	
2. My life is chiefly controlled by powerful others	
3. In order to have my plans work, I make sure that they fit in with the desires of people who have power over me	
4. I feel like what happens in my life is mostly determined by powerful people	

Appendix B

Other variables used in this study

Variable	Values of variable
Entrepreneur's characteristics:	
Vocational training	1 = commercial, 2 = technical, 3 = no vocational training
Training (1)	1 = commercial, 2 = technical/no vocational training
Training (2)	1 = technical, 2 = commercial/no vocational training
Work experience	1 = wide-range experience mostly in production management, 2 = one-sided experience mostly as a non-managerial employee, 3 = many-sided experience in marketing, production and product development
Experience (1)	1 = wide-range experience in production management, 2 = one-sided/many-sided
Experience (2)	1 = one-sided, 2 = wide-range/many-sided
Entrepreneurial experience	1 = yes, 2 = no
Age	1 = 20–30 years, 2 = 31–40 years, 3 = over 40 years
Age (1)	1 = 20–30 years, 2 = 31–40 years/over 40 years
Age (2)	1 = 31–40 years, 2 = 20–30 years/over 40 years
Firm's characteristics:	
Firm's location	1 = capital area, 2 = service centres, 3 = industrialised urban areas, 4 = rural areas
Location (1)	0 = capital area, 1 = other areas
Location (2)	0 = service centres, 1 = other areas
Location (3)	0 = industrialised urban areas, 1 = other areas
Motives at start-up	1 = pull or situational factors, 2 = unemployment or treat of it, 3 = internal motives
Motive (1)	0 = pull or situational factors, 1 = other motives
Motive (2)	0 = unemployment or treat of it, 1 = other motives

Appendix C

Description of the data

	Metal based manuf.		Business services		Refused to participate		Closed		Total	
	N	%	N	%	N	%	N	%	N	%
1990	138	69.0	62	31.0	0	0	0	0	200	100
1997	52	26.0	34	17.0	59	29.5	55	27.5	200	100

	Metal based manufacturing		Business services		Total	
	N	%	N	%	N	%
Growth	28	65.1	15	34.9	43	50
Non-growth	24	55.8	19	44.2	43	50
Responses 1997	52	60.5	34	39.5	86	100
Refused to participate	41	69.5	18	30.5	59	51.8
Closed	45	81.8	10	18.2	55	48.2
No response 1997	86	75.4	28		114	100

Acknowledgment This paper is a revised version of the paper presented in the 13th Nordic Small Business Research Conference, Tromsø, Norway, June 9–12, 2004. We would like to thank Professor Frank Hoy for constructive comments.

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