

Factors contributing to the success measured by two dimensions or multi dimensions in micro startup firms

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Abstract

This study investigates the determinants of start-up success in a sample of Finnish firms. Our database allows us to investigate how qualitative information based on the personal history and characteristics of the owner, and firm specific characteristics affect success described by credit risk category. It seeks to compare the factors affecting two dimensional and multidimensional performance. The data allow us to investigate which factors available at establishment time affect financial performance in the short run (maximum five years). In the establishing phase, there is very a limited amount of financial information. Therefore, we employ variables that investigate the type of funding used, background of the entrepreneur and other non-accounting characteristics of the firm. The results indicate that a multi-dimensional model yield more statistically significant variables compared to two-dimensional model. Furthermore, the founder related variables are not so important than expected.

Key Words: small firms, start-ups, success, credit risk

1 Introduction

Forming a successful venture with given constrained resources is a critical issue for those who are weighing the risk of starting a business. This paper aims, firstly, to contribute to our understanding of the process of success in new firms by analyzing the non-accounting factors involved in the start-up situation in multileveled performance (measured by creditworthiness). During the last decades an extensive literature has examined and explained success in small and medium sized firms. However, most empirical studies on this issue are mainly focused on two dimensional performance. Secondly, the aim of the study is to compare the effects of between multidimensional success and two dimensional success (failure vs. success).

For the small business research a nonfinancial model is more appropriate than a financial model (Lussier and Halabi, 2010; Dennis and Fernald, 2001; Reynolds, 1987). On addition, financial models are not appropriate to use with start-up business, because they simple do not yet have financial accounting data. Furthermore, many studies have found that soft (non-accounting) factors play an important role in determining the ratings of loans to small and medium size firms (Altman, Sabato, and Wilson, 2010; Blumberg and Letterie, 2008; Unger et al., 2011; Treacy and Carey, 2000). Altman, Sabato and Wilson (2010) developed a model with the combined use of hard and soft factors for very small firms: it is the only study which has examined the credit risk of micro firms. Their study confirms that different procedures are needed for SMEs. However, they did not investigate start-up firms. Until recently, the role of non-accounting factors has remained unclear, mainly because non-accounting factors are inherently private, and market data are not available for unlisted firms (Grunert, Norden, and Weber, 2005; Altman, Sabato, and Wilson, 2010).

Generally the success studies have used two dimensional performance models (success vs. failure) (e.g. Lussier and Halabi, 2010). However, it has been shown that the predictors of performance vary depending on whether we use twoleveled or multileveled performance (Cooper, Gimeno-Gascon, and Woo, 1994; Dahlqvist, Davidsson, and Wiklund, 2000). Literature of multileveled success research has remained very scarce. Especially the relationship between different factors and success measured by creditworthiness is unknown. Furthermore, there is variation in the kinds of success measures used in previous research studies on firm success. Comparison between studies is difficult as the time frame, the success indicator, and the success formula often differ (Delmar, Davidsson, and Gartner, 2003).

Our objective is to contribute to small business research by providing a more comprehensive understanding of the success (credit worthiness) in multidimensional performance for genuinely new ventures. This paper investigates potential success of start-up micro firms with Finnish data. The data has been collected at establishment time. We employ variables that investigate the type of funding used, background of the entrepreneur and other non-accounting variables of the firm. Most of the firms have been established around the same time period and within the same geographic area. This insulates our database from differences in overall economic conditions.

We find that the contribution of the variables differs if the performance is measured on more than two dimensions in our sample. The models showed that there are more differences than similarities between the models. As a conclusion we can say that modelling multileveled performance needs more indicators overall to indicate the different levels. In the loan

application phase it is good to know which factors promote the likelihood of survival, especially which factors promote success and low credit risk.

The paper is structured as follows. Section two of the study discusses the relevant literature and motivates the use of variables applied in the analysis. It also outlines the data. Section three provides the empirical results and the final section concludes the study.

2 Aims and procedure

2.1 The framework of the study

The first aim of the study is to clarify which funding, entrepreneur and firm related characteristics are important in predicting the multidimensional success of start-ups. Are entrepreneur related attributes more important for small startups than other attributes? A second aim is to investigate how the outcomes differ between success measured by two dimensions and six dimensions variables. In this study multidimensional success classification is based on repayment ability of the micro firms defined by state-owned financial institution. There are numerous ways to define success. Generally, the prior studies have used as a measure the size, the growth or profitability (Schutjens and Wever, 2000; Shepherd and Wiklund, 2009; Unger et al., 2011).

Most of the success studies have used two leveled performance models (e.g. Lussier and Halabi, 2010). However, it has been shown that the predictors of performance vary depending on whether we use two leveled or multileveled performance (Cooper, Gimeno-Gascon, and Woo, 1994; Dahlqvist, Davidsson, and Wiklund, 2000). The first study of multileveled performance using non-accounting data (Cooper, Gimeno-Gascon, and Woo, 1994) divides performance into three outcomes: failure, marginal survival and high growth. They explore some of the factors that can be observed at the start-up of an enterprise, consisting of human capital and financial capital variables, with the industry serving as a control variable. However, not all the firms in the study are genuinely new: some have been transferred from parents for example. The results suggest that the contribution of some factors varies between marginal survival and high growth. For example firms with women founders are less likely to growth but just as likely to survive. The other general human capital variables (e.g. education) influence both survival and growth. Management know-how variable, and having parents with business experience contribute to marginal survival, but not to growth. In contrast, number of partners contributes to growth but not to survival. In both models prior industry experience and amount of initial financial capital are significant. Dahlqvist, Davidsson and Wiklund (2000) replicate and extend the study of Cooper, Gimeno-Gascon and Woo (1994) using almost the same outcome. In both studies, the predictors of high performance partly differ from the predictors of marginal survival. However, Dahlqvist, Davidsson, and Wiklund (2000) have some different findings. For example, prior industry experience reveals not to be important, parental business experience is negatively associated with marginal survival and seems to be insignificant for high performance, management know-how do not affect marginal survival or high performance, and initial financial capital do not affect on marginal survival. Dahlqvist, Davidsson, and Wiklund (2000) use, in addition to employment growth, sales growth and profitability making the study more reliable. Hence they use the concept of high performance instead of high growth.

Bosma et al., (2004) investigate how human and social capital measures affect three aspects of start-up performance: survival, profit, and generated employment. They find that specific

investments in human and social capital generate more promising start-ups. They do not utilize any firm-specific factors, because they emphasize the single founder as a proxy for the performance of the firm. It can be said that tacit knowledge is the basis for firm-specific attributes. Furthermore, the results reveal that the factors affecting the three outcomes are partly different. Similar effects are obtained only with 'experience in industry', gathering information from 'commercial relations', 'gender' and 'hours worked at the start' (Bosma et al., 2004).

Prior studies are not unanimously agreed about the variables which contribute to the success of small businesses. The comparisons across success studies is also difficult because the methodologies, samples, choice and definition of variables, differ from one research study to another (Murphy, Trailer, and Hill, 1996). Furthermore, the success factors vary in different countries (e.g. Benzing, Chu, and Kara, 2009). Prior studies examine a variety of variables – many of them signifying human capital: the founders' education, training, experience, parent's background and occupational background and others, financial variables, firm and environment related variables. Here the effects of some variables are reflecting survival, growth or profitability probabilities, simple because of the non-existent research on similar success performance or the success is performed as growth, profitability or survival, the other side of two dimensional success.

We include three variables measuring the funding sources used by the firms. The percentage *share of equity* refers to the share of equity capital provided by the owner(s) to total assets. It seems that a high percentage equity investments by the founder(s) demonstrates a positive effect on success (Bosma et al., 2004; Brüderl and Preisendörfer, 1998; Duchesneau and Gartner, 1990). Successful entrepreneurs seeks reduce risk in their firms. It can also be interpreted to reflect the commitment of the founder(s), which is something that lenders value. On the contrary, van Praag (2003) finds no differences in performance between people who started with their own capital and those who start with borrowed capital.

The input of start-up capital is also connected with our other factor, *bank loan*. It equals one for firms that have bank loan in addition to the loan of the state-owned financial institution. Prior empirical research implies that having a bank loan promotes firm success, growth and survival (e.g. Becchetti and Trovato, 2002; Musso and Schiavo, 2008; Riquelme and Watson, 2002; Saridakis, Mole, and Storey, 2008; Åstebro and Bernhardt, 2003). The bankers choose more transparent borrowers, while the state-owned financial institution may have less transparent customers than banks (Daniels and Ramirez, 2008). On the other hand, the entrepreneurs who have also another source of finance perform worse if measured with the growth of new employees. It may be interpreted so that these owners are not so dedicated to their business than others (Bosma et al., 2004).

The third funding variable is the *total amount of loan* (including loan from the bank and the state-owned financial institution). Having more funds is generally considered better for new venture survival and growth compared to having fewer funds available (Cooper, Gimeno-Gascon, and Woo, 1994; Becchetti and Trovato, 2002; Lussier and Halabi, 2010). However, in Schutjens and Wever (2000) the size of the start-up capital is not important for firms' success. Moreover, initial capital do not affect on marginal survival in Dahlqvist, Davidsson, and Wiklund (2000).

The *age* of the owner can have both positive and negative connections with performance. It can be suggested that very young people lack both experience and capital. Consequently the younger the entrepreneur, the more he is likely to fail. Middle-aged entrepreneurs have most likely experience, credibility and energy. Increasing age of the owner is stated to have a negative relationship with firm growth (Kangasharju, 2000). Entrepreneurs's age seemed to have a negative association with performance in the study of Harada (2003). However, age do not have an impact on survival, earnings or generated employment in the study of Bosma et al. (2004).

In regard to *gender* of the entrepreneur, the previous studies are contradictory. Cooper, Gimeno-Gascon and Woo (1994) find that firms with women founders are less likely to grow but just as likely to survive. Harada (2003) find that female gender seemed have a negative association with success. It is also identified that male business founders/owners have a better likelihood to survive, to make better profits and to create employment (Bosma et al., 2004; Kangasharju, 2000). On the other hand, Díaz-Garcí and Brush (2012) find that there are no differences between female and male owners' financial performance in their quantitative study. They suggest that possible gender differences have to be investigated by qualitative approach.

The financial status of the entrepreneur refers to the borrower's resources and his ability to manage them. This variable gets the value of one if the founder owns at least half of his house. Personal property facilitates establishing new firm; also it can enhance survival prospects of the firm (Bates, 1990; Parker, 2004, p.182). In their review article Georgellis, Sessions and Tsitsianis (2005) say the same: a wealthier individual can establish a business with more efficient levels of capital and thereby have better probability to succeed in the business than a poorer one. On the contrary, van Praag (2003) finds no significant effect of personal assets or home ownership on the hazard rate out of self-employment.

A large literature has focused on what makes an entrepreneur successful. The concept of human capital investments or outcomes can be based on assessment of education, experience, entrepreneurs' knowledge, skills and competences (Unger et al., 2011). Most authors has argued that there is a positive relationship between human capital and success (e.g., Barringer and Jones, 2004; Bonet, Armengot, and Martín, 2011; Bosma et al., 2004; Cooper, Gimeno-Gascon, and Woo, 1994; Haber and Reichel, 2005; Littunen and Niittykangas, 2010; Van der Sluis, Van Praag, and Vijverberg, 2005). Human capital has been suggested to be particularly essential for young firms (Davidsson and Honig, 2003; Unger et al., 2011). Founders with greater human capital learn the market conditions faster than those with less human capital and want to have compensation for their human capital investments, hence their firms should be more likely to success the early years of the market selection process. In addition, many studies find that these soft factors played an important role in determining the ratings of loans to small and medium-size firms (Blumberg and Letterie, 2008; Treacy and Carey, 2000). However, the importance of the relationship between human capital and firm success is different among studies. Some studies find high magnitude of the relationship, whereas some find low magnitude of relationship (Unger et al., 2011). According to Unger et al. (2011), this can be due to different independent variables included in the models. The most common indicators of human capital construct are education, work experience from the same sector, management experience and business experience in the family (Reuber and Fisher, 1994; Unger et al., 2011).

Education can symbolize the entrepreneurs capacity to adapt and develop knowledge of the environment (Haber and Reichel, 2005). According to many studies, entrepreneurs who have higher levels of education have greater chance of prospering in their business compared to individuals who have invested less in their human capital (e.g. Bosma et al., 2004; Cassar, 2006; Lussier and Pfeifer, 2001; Lussier and Halabi, 2010). It has been suggested that the level of formal education is correlated to owner's drive, energy, motivation and dedication to the business and thus better business performance (Kim, Aldrich, and Keister, 2006; West and Noel 2009). Furthermore, formal education can be an indicator of good communication, teamwork and problem solving skills (Soriano and Castrogiovanni, 2010). Honjo (2004) as well as Pereira and St.Aubyn (2009) find that increase in primary and secondary levels of education enhances growth. Whereas, in Almus (2002) the owners with university degree seem to have better chances to grow up their business fast. On the other hand, some studies find no relationship between higher education and the probability of performance (e.g. Harada, 2003; Littunen and Niittykangas, 2010; Schutjens and Wever, 2000).

The *entrepreneurial training* variable indicates whether or not the founder has participated in some entrepreneurial training course in connection with establishing the business. The business success is said to be enhanced by the use of outside professionals and advisors for consulting during the establishment phase (Duchesneau and Gartner, 1990). In Spain, Peña (2002) finds it an important determinant of new firm growth. However, expert help at start-up is has no effect on firm's high growth during the first four years, but during five to eight years' entrepreneurship the help has a positive effect (Littunen and Niittykangas, 2010).

Employment status before establishing the business can be expected to influence the performance of a start-up. Starting a firm as an escape from unemployment (push reason, business opportunities) seems not to show any differences in success measured by growth in number of employees compared to entrepreneurs who wanted to be their own boss (pull reasons) (Schutjens and Wever, 2000). Ritsilä and Tervo (2002) emphasize the negative relationship between push motivations (necessity) and firm growth. Similarly, Littunen and Tohmo (2003) find that positive situational and pull factors are strongly motivating and precipitating factors in the creation of a high-growth business. On contrast, motives at start-up are not statistically significant for rapid growth during the first four years in Littunen and Niittykangas (2010). We expect the prior employment may also be associated with higher rates of success in five year period due to a positive motivation. It might also provide a stimulus not to return to the unemployment situation.

Prior work experience in the same sector represents a form of specific human capital. Industrial knowledge and experience is associated with the particular skills, insights and abilities transferable to a sector or industry, e.g. understanding of markets and customers, and of course understanding of the specific technologies (Reuber and Fischer, 1999). The industrial experience which has been developed prior to starting up the firm have a positive effect on new firm performance (Blumberg and Letterie, 2008; Bosma et al., 2004; Cooper, Gimeno-Gascon, and Woo, 1994; Harada, 2003; Lafuente and Rabetino, 2011; Lussier and Halabi, 2010; Schutjens and Wever, 2000; Soriano and Castrogiovanni, 2010; van Praag, 2003). These individuals have developed their expertise and experience which they bring to their new firms. Nevertheless, empirical evidence on this issue remains unclear. West and Noel (2009) do not verify the impact of previous industrial experience on new venture performance. It can be that the environment is so dynamic and value of previous experience erodes very fast (Newbert, 2005).

The final of founder attributes is the personal *business experience*. Individuals who have been running their own firm have gained valuable experience, which has been found to be a critical success factor for small firms (e.g. Harada, 2003; Yusuf, 1995). Individuals with prior business experience is stated to have larger social networks and therefore more able to develop networks relationships than novice entrepreneurs who have less skills to modify their network team (Mosey and Wright, 2007; Zolin, Kuckertz, and Kautonen, 2011). On the other hand, people with experience in running a firm could be named as ‘opportunists’ (Storey, 1994). They may lack managerial skills and they have not learned from their mistakes. According to Blumberg and Letterie, (2008), banks do not value this experience during the loan application phase. Furthermore, some studies believe that entrepreneurial experience does not have a significant influence on small firm performance (Bosma et al., 2004; van Praag, 2003).

All start-ups have skills and routines embodied in their founders that are likely to influence the new firm’s future development and success. For independent start-ups that are not continuing the business of parents, or are result of mergers by existing firms, pre-entry capabilities are associated primarily with the founders, who usually play an important role in the management of the start-up (Watson, Hogart-Scott, Wilson, 1998). Since very small firms are usually headed by one owner it can be expected that the role of the owner is in such firms central particularly. Thus, the first research hypothesis argues as following:

H 1: The characteristics of the founder play an important role in the survival of a start-up micro firm even though success is measured by two or multi dimensions.

We include three firm specific attributes. These variables are legal form, team, and location. *Legal form* differentiates between limited liability companies and sole proprietorship / partnership and obtains the value of one in case the firm is structured as a limited liability company. Generally the previous literature indicates that limited liability companies have higher potential for growth (Almus, 2002; Coad and Tamvada, 2011; Davidsson et. al., 2002). However, the legal firm form has not shown to be linked to the probability of survival (Saridakis, Mole, and Storey, 2008; Åstebro and Bernhardt, 2003). Our expectations of legal form on credit risk are ambiguous.

Another relevant issue deals with the effect of the *entrepreneurial team* on firm success. The team variable indicates whether the start-up firm is run by a team as opposed to an individual. There are several studies that show a positive association between firms founded by teams and their success and growth (e.g. Cooper, Gimeno-Gascon, and Woo, 1994; Friar and Meyer, 2003; Lafuente and Rabetino, 2011; Littunen, 2000; Littunen and Niittykangas, 2010; Lussier and Halabi, 2010; Schutjens and Wever, 2000). This is because they have wide array of skills and resources needed for the firm’s success. However, some studies take the possible disadvantages of teams into account. Lechler (2001) suggests that among multiple founders’ firms personal conflicts and inefficient communication can occur. In his study the team variable has only weak predictive value for performance.

Location indicates whether the firm is located in the same city as the office of the state-owned lender i.e. in bigger cities. Empirical evidence on this topic is inconclusive. Strotmann (2007) and Storey and Wynarczyk (1996) find that firms located in rural areas have higher chances of survival than those located in urban areas. On the other hand, areas with high rates of new

Table 1
Definition of Variables

Success 6	1 = operation is profitable since years / 2 = operation is profitable 3 = difficulties to tolerate disturbances, changes in profitability 4 = operational and financial difficulties, need for reorganization 5 = clear threat of bankruptcy 6 = unable to pay back their loan
Success 3	1 = operation is profitable / 2 = difficulties to tolerate disturbances, operational and financial difficulties, clear threat of bankruptcy 3 = unable to pay back their loan
Success 2	0 = the firm has failed / 1 = the firm has succeeded
<i>Firm Finance</i>	
Equity %	percentage share of equity
Bank loan	dummy, 1 = firm has loan from state-owned financial institution and bank
Loan amount	total loan amount €
Ln(Loan amount)	ln(Total loan amount €)
<i>Founder attributes</i>	
Ln(1+Age)	ln(1+Age of the founder(s) when business started, mean age if there are more than one founder)
Gender	1 = male(s) / 2 = female(s) / 3 = the firm founders represent both gender
Financial status	dummy, 1 = the founder(s) has property
EmploymentStatus	0 = the founder(s) was unemployed prior to starting in business 1 = employed
Ln(WorkExpYrs)	ln(Work experience in years in the same sector)
WorkExperience	dummy, 1 = the founder has work experience in the same sector
Business experience	dummy, 1 = the founder(s) has prior experience of running a firm
Education	1 = no professional education / 2 = the founder(s) has degree of vocational school / 3 = college / 4 = university
Training	0 = the founder was not in receipt of entrepreneurial training course prior starting in business / 1 = the founder was in receipt of the course
<i>Firm attributes</i>	
Legal form	0 = sole proprietorship or partnership / 1 = limited company
Team	0 = single founded / 1 = team
Location	dummy, 1 = the firm locates in the same city like the state-owned financial institution, i.e. in bigger cities
<i>Control</i>	
Industry	1 = farming, fishing, forestry or manufacturing or construction 2 = whole and retail trade industry 3 = hotels and restaurants 4 = transport, communications 5 = financial intermediation, real estate, renting and business activities, or Education, health and social work, or other community, social and personal service activities
Marital status	1 = single / 2 = marriage/cohabitation without marriage 3 = divorced / widowed

firm formation and where the environment offered good opportunities are also those which have the highest closure rates (Littunen, Storhammar, and Nenonen, 1998). Similarly, like we, Schutjens and Wever (2000) use proxies for urban and rural areas and find that the location variable has nothing to contribute (Schutjens and Wever, 2000).

The final two variables in our study serve as *control variables*, industry and marital status. The industry is a general variable in explaining the firm performance. We distinguish farming, fishing, forestry, manufacturing, construction, wholesale/retail trade, hotels and restaurants, transportation, communications, financial intermediation, real estate, renting and business activities, education, health and social work, other community, social and personal service activities. The data do not include any traditional agriculture firms. Marital status takes three values: single, married/cohabitation without marriage, and divorced/widowed.

Clearly, then, very small firms have been largely ignored in the literature, and few studies have examined startup small firms. Most of the studies have divided the firms into two categories: succeeded and failed. Moreover, to the best of our knowledge, there are no studies of small startups which use a multileveled performance model. We expect that by using only non-accounting variables, as Cooper, Gimeno-Gascon, and Woo (1994) and Dahlqvist, Davidsson, and Wiklund (2000) did, there are differences between the two dimensional and multi dimensional models. Hence, we test the following hypothesis:

H 2: The contribution of non-accounting variables varies between success (credit risk) measured by two dimensions or multi dimensions in small startup firms.

A list of variables used in this study, including their definitions, is provided in Tables 1. The table presents the variables of foundation time.

2.2 Data collection and subject

The sample consists of 440 start-up micro firms collected in 2003 and in 2005 from the list of starting firms registered in the database of Finnvera which is a specialized financing company owned by the Finnish state. A loan of this corporation is granted to all the firms in the sample, and all the firms also have a documented business plan. The data was collected from loan applications from 1998 or 2000. We excluded the firms which were bought from a previous owner, and where one owner did not represent a private person or micro enterprise. The entrepreneurs which started their business in traditional agriculture or as part of a franchise chain were also excluded.

The sample represents credit risk categories based on the situation five years after starting the business. Lender had assessed the borrowers' creditworthiness and placed them in the appropriate category using "hard" accounting data and also "soft" non-accounting information. We investigate the success of start-up firms on three dependent variables. For the multidimensional success equation, the dependent variable SUCCESS6 and SUCCESS3 is assumed to be ordinal. The ordering is determined by sorting the values of the dependent variable in ascending order, the lowest value defining the first category. SUCCESS6 has five, and SUCCESS3 has two categories for non-defaulted borrowers. Rating grade 1 corresponds to the lowest and grade 6 or 3 to the highest degree of credit risk (For more details see Table 2). The reference group is failed firms, and all succeeded firms are compared with the failed firms. The dependent variable SUCCESS2 is a dichotomous variable which equals one for firms that are still operating five years after establishment, and zero otherwise. The

background variables describe the situation at start-up in 1998 or 2000. Therefore, it is possible to investigate the impact of the factors that prefigure success five years after establishment. For multivariate analysis we use ordinal regression with logit link function and logistic regression analysis. Ordinal regression analysis allows the modelling of the dependence of a polytomous ordinal response on a set of predictors. Like credit risk, the dependent variable is assumed to be ordinal. The ordering is determined by sorting the values of the dependent variable in ascending order. The model of ordinal regression analysis which we use is based on the methodology of McCullagh (1980) and performed using SPSS 19.0. The program uses the logistic cumulative probability function in predicting financial health status (SUCCESS6 and SUCCESS3). Logistic regression is used to investigate the relationship between success and failure (SUCCESS2).

Table 2
Definitions of Success6 according to credit risk categories

Category	Definition	Number of firms
1	Operation is profitable since years.	75
2	Operation is profitable.	68
3	Difficulties to tolerate disturbances. Changes in profitability.	61
4	Operational and financial difficulties. Need for reorganization.	72
5	Clear threat of bankruptcy.	63
6	Unable to pay back their loan.	101
Total		440

3 Findings

This study examines, firstly, the importance of founder attributes in a multi-dimensional success model for genuinely new firms. Estimation results for six and three dimensional success are presented in Table 3. In all three models the Equity% received statistically significant values, meaning that an increase in equity investments by the owners decreases the credit risk. The total loan amount (in Euros) is however, important only for SUCCESS6. The higher is the loan amount the lower is the credit risk. These findings of firm funding are in line with e.g. Bosma et al. (2004), Duchesneau and Gartner (1990) who suggested that high percentage equity has a positive effect on firm success. It can also reflect the founder's commitment. Furthermore, the founders with high amount of loan have also a better change to be part of the lowest credit risk category. The result is consistent with Cooper, Gimeno-Gascon, and Woo (1994), Becchetti and Trovato (2002) and Lussier and Halabi (2010), who found that having more funds is better for survival and growth. The observed correlation between Equity% and Loan amount is -0.049 and is not statistically significant.

The results of founder age in SUCCESS3 model indicate that the older the person is the lower is the credit risk. It may be interpreted so that the older founders are more stable and motivated to start up their business. They may also have more long term planning ability. For the firm performance increasing age is stated to have a negative effect (Harada, 2003; Kangasharju, 2000). Moreover, our results contradict with Bosma et al. (2004) who find no relationship with owner's age and survival, earnings or generated employment. In regard to

Table 3
Estimates for multi-dimensional success

The results are obtained through an ordinal regression where the link function is logit.

The lowest value defines the first success category where the credit risk is lowest.

The last category serves as reference group including all failed firms.

		SUCCESS6		SUCCESS6		SUCCESS3	
		Coeff.	<i>p</i>	Coeff.	<i>p</i>	Coeff.	<i>p</i>
<i>Firm</i>	Equity %	-0.025	0.001	-0.032	0.000	-0.028	0.001
<i>Funding</i>	Loan amount					-0.004	0.471
	Ln(loan amount)	-0.371	0.073	-0.637	0.008		
	Bank loan	-0.324	0.317	-0.512	0.175	0.085	0.790
<i>Founder</i>	Ln(1+Age)	-0.913	0.112			-1.129	0.070
<i>attributes</i>	Male	-1.394	0.007	-1.154	0.044	-1.455	0.011
	Female(s)	-1.084	0.046	-0.901	0.141	-1.146	0.053
	Financial status	0.182	0.506			0.238	0.424
	Employment status	0.849	0.001	0.685	0.036	0.721	0.016
	No Prof. Education	-0.607	0.227	-1.038	0.086	-0.504	0.358
	Vocational school	-0.552	0.178	-0.535	0.238	-0.479	0.285
	Collage/Polytechnic	0.064	0.873	-0.050	0.912	-0.005	0.990
	Training	-0.296	0.293	-0.106	0.745	-0.338	0.271
	Ln(Work exp yrs)			-0.245	0.138		
	Work experience	0.211	0.638			0.138	0.776
	Business experience	-0.792	0.016	-0.512	0.204	-0.879	0.014
<i>Firm</i>	Legal form						
<i>attributes</i>	Team	0.795	0.033	0.607	0.156	0.911	0.027
	Location	-0.584	0.023	-0.706	0.019	-0.434	0.120
<i>Control</i>	Industry5	Yes		Yes		Yes	
	Marital status/single	0.211	0.680	0.728	0.183	0.336	0.545
	Married/cohabitation	0.230	0.588	0.407	0.385	0.329	0.478
	Number of obs	249		183		249	
	Pseudo R ² Nagelkerke	0.231		0.239		0.228	
	Model Fitting Information	0.000		0.000		0.000	
	Goodness-of-Fit	0.150		0.038		0.077	
	Test of Parallel Lines	0.118		0.009		0.140	

gender of the entrepreneur the results shows that male has the best probability to lowest credit risk in his business than a firm where the owner is a female. This follows the findings of Bosma et al. (2004), Cooper, Gimeno-Gascon, and Woo (1994) and Kangasharju (2000). In this data the worst probability to lowest credit risk exits in a business where male and female founded the firm together. In the second SUCCESS6 model we also obtain a statistically significant coefficient for our measure of education. This suggests that the founders without professional education represent the lowest credit risk category. This is surprisingly, most of

the studies claims opposite effect of education. On the other hand, Littunen and Niittykangas (2010) and Schutjens and Wever (2000) do not find any relationship between growth and education. It can be argued that for these people it is difficult to sit in the class room, and they prefer to work with their hands. They can be even very hard-working. The results also show that firms lead by persons who were working before starting a firm (employment status) have a higher likelihood of being part of a better credit risk category. This finding is consistent with Ritsilä and Tervo (2002) and Littunen and Tohmo (2003) who studied growth. The last important founder attribute concerns personal business experience. It surprise also, individuals who have no prior business running experience have a higher likelihood of having lower credit risk firm. Our results are in line with those of Storey (1994), who termed these people ‘opportunists’.

As far as our firm attributes are considered, the results indicate that firms founded by teams have a higher likelihood of being part of a better credit risk category. The result of team variable is consistent for example with the findings of Cooper, Gimeno-Gascon, and Woo (1994), Lafuente and Rabetino (2011) and Littunen and Niittykangas (2011). In addition, results also suggest that geographic location has an impact on credit risk. To be more precise, if the firms are in the same city with the lender the probability of credit risk is higher. In these cases, both lender and borrowers are in big cities, and according to Strotmann (2007) firms in rural areas have a higher chance of survival. He says that in bigger cities higher cost may hamper survival. Another possible explanation might be that the lenders think that they know the local business environment and may therefore be less careful in evaluation borrowers.

The first research hypothesis (H1) proposed that the characteristics of the founder play an important role in multidimensional success. With respect to hypothesis, the results of the survival measured by three dimensions model indicate that the founder attributes are important to success (Table 3). The support of the hypothesis is based on five founder attributes: founder age, male(s), female(s), employment status and, business experience. However, if measuring the success with six dimensions we find that the hypothesis is in some extent supported by the analysis. The founder attributes are important, but also firm funding and firm attributes give a great significance in explaining the success.

The hypothesis regarding success measured on two dimensions (Table 4) is weakly supported by the analysis. Two founder-related variables are statistically significant, employment status and work experience. We can say that the founder do not embody all the factors that influence the new firm’s success. Our findings are similar with those of Storey and Wynczyk (1996) who showed that the talent of the entrepreneur is not the unique determinant of survival. In our logistic model firm funding variables are strong for estimating success.

The results of funding variables show that the increase in equity share and loan amount as well as having bank loan in addition to loan from state-owned financial institution increases the probability of survival i.e. success in two dimensional model. The results of own investments follows the ones of Bosma et al. (2004). Having a bank loan is also in line with previous studies, e.g. Riquelme and Watson (2002) and Åsterbro and Bernhardt (2003). Furthermore, having more funds at start up phase is generally considered good for success (e.g. Lussier and Halabi, 2010).

When we examine the impact of founder and firm attributes, we observe that person who was unemployed before starting a firm has a higher probability of success. This is an interesting

Table 4
Estimates for two dimensional success

The results are obtained through a logistic regression where the dependent variable has the value of one if it has succeeded and zero otherwise.

		SUCCESS2		SUCCESS2	
		Coeff.	<i>p</i>	Coeff.	<i>p</i>
<i>Firm Funding</i>	Equity %	0.065	0.003	0.065	0.003
	Ln(Loan amount)	2.263	0.000	2.280	0.000
	Bank loan	1.342	0.066	1.370	0.058
<i>Founder attributes</i>	Ln(1+Age)	0.650	0.640		
	Male(s)		0.574		0.543
	Female(s)	0.690	0.618	0.561	0.681
	Both genders	1.380	0.381	1.289	0.403
	Financial status	0.813	0.193	0.710	0.227
	Employment status	-1.095	0.127	-1.145	0.090
	No prof. education		0.094		0.084
	Vocational school	0.923	0.495	1.011	0.443
	Collage/Polytechnic	0.477	0.610	0.402	0.656
	University	-1.151	0.248	-1.188	0.215
	Training	0.231	0.714		
	Ln(WorkExpeYrs)	0.495	0.151	0.550	0.082
	Work experience				
	Business experience	-0.123	0.889	-0.196	0.818
<i>Firm attributes</i>	Legal form	-0.225	0.782	-0.291	0.718
	Team	-0.799	0.434	-0.754	0.458
	Location	1.175	0.045	1.248	0.031
<i>Control</i>	Industry5	Yes		Yes	
	Marital status/single		0.813		0.828
	Married/cohabitation	-0.204	0.828	-0.254	0.782
	Divorced/Widowed	0.302	0.722	0.229	0.773
Constant		-8.760	0.137	-6.073	0.017
Total classification rate (%)		85.4		85	
Number of obs		158		160	
Pseudo R ² Cox & Snell		0.289		0.288	
Pseudo R ² Nagelkerke		0.456		0.455	

finding, because some previous studies have reported contradictory findings for firm success defined by growth (e.g. Littunen and Tohmo, 2003; Ritsilä and Tervo, 2002). Some previous studies do not identify any relationship between employment status and success (Schutjens and Wever, 2000). This may be interpreted so those founders with experience of prior unemployment are unwilling to return to unemployment and try thus more to succeed in their firm. Furthermore, the second model reveals that the founder's work experience in years in the same sector increases the likelihood of success. The results are similar to the ones in Blumberg and Letterie (2008), Bosma et al. (2004), Cooper, Gimeno-Gascon, and Woo

(1994), Harada (2003), Lafuente and Rabetino (2011), Lussier and Halabi (2010), Schutjens and Wever (2000), Soriano and Castrogiovanni (2010), and van Praag (2003). The results also indicate that only one of the firm specific variables, geographic location takes statistically significant coefficients. If the firms locate in the same city as the office of the state-owned lender the probability of success increases. In these cases, both lender and borrowers are in big cities, and according to Fotopoulos and Louri (2000) firms in urban areas have a higher chance of survival.

The second research hypothesis (H2) assumed that the contribution of factors varies between success measured by two dimensions or six dimensions. The results reveal that there are more differences than similarities between the multivariate models. The models show two similarities between the two dimensional and multidimensional models: an increase in equity investments by the owners, and increase in loan amount increases the likelihood of success as well as multidimensional success i.e. it decreases the credit risk of the firms. Moreover, the likelihood of success increases if the firm is located in the same city as the lender, i.e., in the bigger cities. There were more differences than similarities between the models. Age of the founder, gender, business experience, education and wheatear the firm was founded by a team are only statistically significant in the multidimensional models. In addition, the employment status has different outcomes in the models. In the two dimensional model a person who was unemployed before starting a firm has a higher probability of success. In contrast, in the six dimensional model firms which are lead by persons who were working before starting a firm have a higher likelihood of being part of a better credit risk category. It can be explained that although the founders with prior unemployment have better probability to survive they do not omit abilities, discipline or motivation to get their business stable and profitability. Or it may be because these people need more time to settle down a profitable firm.

As a conclusion we can say that modelling multileveled performance needs more indicators overall to indicate the different levels. This is consistent with the findings of Cooper, Gimeno-Gascon, and Woo (1994) and Dahlqvist, Davidsson, and Wiklund (2000), who apply human and financial capital variables. In the loan application phase it is good to know which factors promote the likelihood of survival, especially which factors promote low credit risk. A study based mainly on financial ratios and only two qualitative variables by Psillaki, Tsolas and Margaritis (2010) find that there is no variation. The difference in the results could be interpreted to mean that so-called soft variables are more sensitive to the variance of dimensions, and financial ratios are unable to divide the firms into multileveled categories.

4 Conclusions

This paper investigates the success of start-up micro firms with Finnish data. The data has been collected at a very early stage in the life of the firms. Therefore, we employ variables that investigate the type of funding used, background of the entrepreneur and other non-accounting characteristics of the firm. Our main contribution to the literature on start-up success is that we are able to investigate the determinants of success in multileveled performance with very small firms.

As far as the results go we find that the characteristics of the founder play an important role in multidimensional success. However, also firm funding and firm attributes give a great significance in explaining the success. The founder attributes are most important in the three dimensional model. The six dimensional model included additional firm funding and firm

related attributes. Typical measures of human capital, like education, work experience, are not very important. This contradicts with e.g. Unger et al. (2011) who suggest that human capital is particularly essential for young firms.

When it comes to the results of comparing multidimensional and two dimensional success model, we observe that the contribution of factors varies between models. Founder's age, gender and business experience are statistically significant only in the multidimensional models. A specific feature in our sample is that we could investigate the contribution of the firms founded with both genders. Generally, the studies concentrate only on comparison between females and males. The firms founded by males seem to be less risky. The least successful firm is founded by both genders. Interestingly, firms lead by persons who were working before starting a firm (employment status) have a higher likelihood of being part of a better credit risk category. On the other hand they probability to survive is lower. In addition, education and team variables are only important in multidimensional models. As a conclusion we can say that modelling multileveled performance needs more indicators overall to indicate the different levels. This is consistent with the findings of Cooper, Gimeno-Gascon, and Woo (1994) and Dahlqvist, Davidsson, and Wiklund (2000).

Entrepreneurs and the processes they use in stating their firms will vary by line of business and their background. In interpreting the results of this study we should keep in mind the influence on other variables could give different models. For example the influence of founder's motivation remains uncovered. Furthermore, bigger samples could yield more conclusive findings. Our analysis and the results obtained may guide financial institutions, venture capitalists, entrepreneurs, academics, and policy makers in their evaluation of micro firms start-ups. It is important for all those involved in business start-ups to prevent losses. With this study we seek to contribute to the lending process of start-up micro firms and the ongoing debate in the literature. There are many small firms and hence small firms' exposure is a relatively high share of bank loan portfolios. If the lenders ability to foresee the attributes that predetermine small business success improves, it may help them finance more small firms at start-up stages.

Credit risk is the single most important risk for a large number of financial institutions. However, research on credit risk management for small firms is relatively rare. Future investigations should include the growth aspect in a multileveled performance model. For example how the effects of too slow and too fast growth rates are related to credit risk. The link between the personnel growth or turnover on the one hand and firm success (credit risk) is not as straightforward as it seems. This study has identified the important factors which influence financial performance, here also identified as credit risk. It is clear that start-up firms' performance presents challenges for future research seeking to improve the information and develop adequate risk models for these firms in order to reduce moral hazard and adverse selection problems.

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