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**SELF-SELECTED SELF-EMPLOYED:
THE ROLE OF EDUCATION IN SUCCESS*****

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ABSTRACT: This paper analyses the effect of owner-manager's education on the success of small firms during economic downturn and upturn. The selective nature of being self-employed is also modelled, as the most educated are least likely to be self-employed in the first place. General labour market conditions affect the relative closure rates of firms run by highly and less educated owner-managers. Exit probability is lower for the highly educated during recession, but higher in a boom. There are at least two possible reasons for this. First, self-employment is an inferior choice to wage work, particularly for the highly educated, due to lower earnings prospects. Second, the highly educated faced a higher outside demand for their labour than did the less educated during the economic upturn. Regardless of the aggregate economy, firms run by highly educated owner-managers had higher growth probabilities than those run by less educated ones.

Keywords: Education, self-employment, firm growth, exit, selectivity

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TIIVISTELMÄ: Tässä työssä analysoidaan pienyrittäjän koulutuksen vaikutusta yrityksen menestymiseen 1990-luvun alun lasku- ja nousukaudella. Analyysissa otetaan yrittäjien valikoituminen huomioon, sillä korkeasti koulutetut eivät ryhdy yrittäjiksi yhtä usein kuin vähemmän koulutetut. Tulokset osoittavat, että yrittäjän koulutuksen vaikutus yrityksen säilymiseen markkinoilla riippuu työmarkkinatilanteesta. Laskusuhdanteessa korkeasti koulutetut poistuvat markkinoilta muita harvemmin, kun taas nousukaudella korkeasti koulutetut poistuvat markkinoilta muita useammin. Tälle on löydettävissä ainakin kaksi selitystä. Ensinnäkin palkkatyö on pienyrittäjyyttä suositumpi vaihtoehto etenkin korkeasti koulutetuilla parempien ansaitsemismahdollisuuksien vuoksi. Toiseksi laskusuhdanteen kääntyessä noususuhdanteeksi korkeasti koulutettujen palkkatyömahdollisuudet paranevat aiemmin ja nopeammin kuin vähemmän koulutettujen. Lisäksi havaitaan, että korkeasti koulutettujen yrittäjien yritykset kasvavat useammin kuin vähemmän koulutettujen yritykset.

Avainsanat: Koulutus, pienyrittäjyys, yrityksen kasvu, markkinoilta poistuminen, valikoituvuus

CONTENTS

1. INTRODUCTION.....	1
2. DETERMINANTS OF FIRM SUCCESS.....	4
3. ECONOMIC DOWNTURN AND UPTURN OF THE 1990S.....	6
4. DATA, VARIABLES AND THE METHOD OF ESTIMATION	8
5. RESULTS.....	10
6. CONCLUSION	15
REFERENCES	16
APPENDIX.....	18

1. INTRODUCTION

Education is traditionally viewed as an investment for the future. There is abundant evidence in everyday life and scientific literature that the acquisition of education improves the future earnings and overall success of individuals (Angrist and Krueger, 1999). Another issue, then, is whether this holds in the case of self-selected groups, such as self-employed persons. They are generally regarded as rather original persons who may have learned their business skills without much formal education.

The objective of this research is to search microeconomic data for statistical evidence as to whether differences in the education of the owner-managers result in performance differences at the firm level. We measure the success of self-employed in two ways: the survival of the firm and its growth. It is presupposed that the smaller the firm, the more the owner-manager personifies the internal determinants of its success, since in larger firms it is harder to point out the effect a single person has on the success of the firm. Hence, the most obvious way to study such personification is to analyse small firms. The present paper analyses the very smallest firms with less than 10 employees.

In general, higher education of the owner-manager should improve the growth opportunities of the firm. This is because higher education improves the ability to comprehend market prospects, resulting in better exploitation of the demand on the market. However, individuals with higher education may also possess higher innate abilities than those with lower education for reasons other than the education itself (Chamberlain, 1977; Griliches, 1977). That ability both induces the persons to obtain more education and improves their success in the business. In other words, education of the owner-manager is, in a sense, an endogenous variable in determining the growth of the firm. Hence, the resulting self-selection bias is to be corrected. If the bias is not accounted for, as is the case with most of the relevant firm growth literature (Storey, 1994; Barkham et al., 1996), we are likely to obtain biased estimates for the effect of education and other personal characteristics of the owner-manager. Once the bias is corrected for we should obtain a smaller but positive relation between education and firm growth due to reasons mentioned above.

Intuitively, one might think that the survival of firms also depends positively on the education level of the owner-manager, since higher education improves the awareness of the risk levels in business and adaptability in changing circumstances. However, higher education does not necessarily increase the rate of survival. We argue that general labour market conditions may partly determine the survival. Evidence suggests that self-employment tends to be an inferior choice compared to wage work, particularly for highly educated people due to lower earnings prospects (Parkkinen, 2000; Uusitalo,

1999). Highly educated persons earn more as employees than they would do as self-employed. This also applies to persons with mere basic education but the earnings difference is much smaller. If this is accompanied by a trend in which labour demand is more focused on individuals with higher education, we may observe that higher education in fact increases the possibility of firm closure.

Therefore, if general employment in the economy is improving, highly educated persons may cease operating as self-employed more often than self-employed with a lower level of education and go to work for another firm as an employee. If, on the other hand, general employment in the economy is deteriorating, self-employment becomes a more attractive alternative for individuals with any level of education. In this case firms run by highly educated owner-managers may even have a higher probability of survival, due to the reason explained above. Note that even though the success of the firm is certainly of importance for the owner-manager, their own labour market success (whether as self-employed or as an employee) is still more important. Thus, the closure of a firm may not be considered a failure, but a result of a better job market offer. In other words, we must separate the success of the owner-manager from that of the firm.

There is another mechanism that causes the observed firm closure rate to be higher for the highly educated. If the growth of firms run by highly educated owner-managers is faster than that of those run by the less educated ones, there is a higher chance that the highly educated start receiving their earnings as wages instead of entrepreneurial income. This means that they become employees in the firm they own. This, in turn, results in the disappearance of the individual from the pool of self-employed of our data, which (artificially) raises the failure rates of the highly educated relative to others. Of course, the same result would apply to the less educated if growth probability was higher for them than for the highly educated.

We analyse the success of self-employed and their firms in two periods, an economic downturn (1990-1992) and the subsequent upturn (1993-1995). Results show that, regardless of the general economic conditions, the higher the education of the owner-manager the greater are the growth possibilities of a firm. In contrast, the phase of the business cycle tends to affect the relative survival rates of firms run by owner-managers with different levels of education. In an economic downturn a higher level of education raises the probability of survival, whereas in an economic upturn it actually decreases this probability. We may thus conclude that general labour market conditions determine the likelihood of firms staying in the markets. Moreover, higher education improves the performance of firms in the self-selected group of the self-employed (just like it improves the labour market success of the population in general).

The rest of the paper is organised as follows. In section 2 we discuss the relevant literature. In section 3 we describe the time periods under investigation, and the change in employment and labour market transitions according to level of education. In section 4 we describe the data and variables used. In section 5 we present the results and in section 6 conclude the paper.

2. DETERMINANTS OF FIRM SUCCESS

To date, there is no unified theoretical model on firm success. There are, however, several recent models that shed light on the success of firms from various perspectives (Jovanovic, 1982; Hopenhayn, 1992; Cabral, 1993; Ericson and Pakes, 1995). As an early contributor, Penrose (1959) considers the growth of a firm as motivated by external opportunities, such as promising demand prospects for the firm's product, and/or internal inducements, such as a shift to a more efficient utilisation of existing resources of the firm. On the other hand, external and internal factors may also function as obstacles to growth.

As far as external success determinants are concerned, demand for the firm's products is the major factor. Second, the market actions of competitors, the supply of production factors and the features of the local business environment are typically external to a small firm. Internal success determinants include the features of the firm itself, such as the size and age of the firm, the characteristics of the resources (such as those of the employees and the manager) as well as the strategic choices of the firm. In brief, internal factors determine the success of the firm in the market structured by external factors.

Empirical work recognises several factors as determinants of firm success. To be able to analyse the effect of education, we have to control for those other determinants. First of all, there is evidence in favour of the life cycle effect, i.e. for any given size-class of firms, younger firms tend to have lower survival rates than their older counterparts, whereas the growth rates are higher particularly for those young firms that do survive (Dunne and Hughes, 1994; Mata, 1994; Mata and Portugal, 1994; Dunne et al., 1989 and 1988; Evans 1987a and 1987b).

Secondly, we may expect that the life cycle effect also applies to the age of the owner-manager (Kangasharju, 2001). Younger owner-managers are often more highly motivated than older ones, since they want to put their own abilities to the test. The older ones usually have more realistic views of their possibilities, and therefore their firms are more likely to have reached the desired (or sufficient) size than are those run by younger ones. The hypothesis suggests that firms run by younger owner-managers tend to have a higher growth probability than those run by their older counterparts, providing that the firms do survive in the first place. On the other hand, firms run by older owner-managers are more likely to survive, since the need for risk-taking is lower due to lower motivation for growth, and the possession of higher levels of experience. The exit rate increases, however, after the owner-manager reaches the age of 50 years, due to early retirement and age-related illnesses.

Thirdly, there is a growing body of literature on the effects of other owner-manager characteristics on small firm success (Barkham et al., 1996; Storey, 1994; Kivimäki, 1998; Littunen, 1996). Small-business owner-managers have several characteristics that affect the success of their firms, most of which are not measurable, however. Storey (1994) provides an extensive survey that highlights characteristics such as age, gender, the level of education, whether the owner-manager is also the founder of the firm, and whether he/she has prior managerial experience. The survey indicates that the most successful entrepreneur is middle-aged, relatively well educated, has prior managerial experience, and has already been running a firm earlier and is now running a firm founded jointly with other entrepreneurs. The gender of the owner-manager does not affect the success of the firm, although men are more likely than women to set up a firm in the first place (Chell, 1998; Johansson, 1999).

As already mentioned, external factors affect the success of firms, too. Differences in the growth rates of industries result in inter-industry firm performance differences. Hence, the industry in which a firm operates plays an important role for its growth and survival chances. Last but not least, aggregate economic fluctuations inevitably affect the success of firms. The next section describes overall market fluctuations in Finland during the 1990s.

3. ECONOMIC UPTURN AND DOWNTURN OF THE 1990S

The present paper argues that aggregate labour market conditions affect the closure rates of firms run by owner-managers with different levels of education. The beginning of the 1990s is an excellent period to test the validity of such an argument in the Finnish case, due to strong macroeconomic fluctuations. Note that figures presented in this section are aggregate register-based statistics for the whole population of Finland. In contrast, the following sections use our sample of self-employed persons.

The overheating period of the Finnish economy in the late 1980s was followed by a sudden and severe economic crisis in the early 1990s. GDP dropped by some 10% altogether, unemployment rose from less than 4% to nearly 17%, property values practically collapsed and the public sector debt expanded vastly (Koskela and Honkapohja, 1999). The first signs of recovery emerged in 1993. The average annual growth rate of the GDP has remained at around 5% for several years since 1993, the rate of unemployment dropped below 10% by the end of the decade and, currently, the national budget is in surplus.

During the recession, employment deteriorated for workers with all levels of education. This suggests that the self-employed, who had been considering whether to transit from self-employment to wage work, had to postpone their plans (Table 1). In contrast, during the early recovery the employment of the highly educated improved by some 8% and the employment of those with intermediate grades by almost 6%, whereas that of the less educated continued to deteriorate. This suggests that particularly the highly educated had more opportunities to choose between wage work and self-employment compared to the earlier period.

Table 1. Change in employment according to level of education

Level of education	1990-1992	1993-1995
Low	-19.8%	-4.5%
Intermediate	-12.8%	5.6%
High	-0.9%	7.9%

Notes: Low=9 years or less education, Intermediate = 10-12 years of education, and High = 13 years or more

A brief examination of employment streams reveals that self-employed persons with higher education indeed transited more often to wage work than did those with less education between 1993 and 1995 (Table 2). More than 26% of the highly educated self-employed transited from self-employment to wage work. The difference to the self-employed with lowest level of education is particularly strong. The transition of the

self-employed with the lowest level of education was less than 12%. This implies that the more the general employment improves for a certain educational group, the larger the fraction of self-employed who transit to the pool of wage workers. Indeed, despite the increasing demand for the products of their firms, the highly educated transited to wage work. All this indicates that self-employment is usually an inferior choice to wage work.

Table 2. Number of self-employed (aged 19-64) in 1993 according to level of education, and their labour market status in 1995

	1993 Number of self- employed	Labour market status in 1995				
		Wage work	Unemployed	Self- employed	Out of labour force	Age over 64 years or emigration
Low	125151	11.8%	17.3%	58.7%	10.4%	1.8%
Intermediate	150682	20.9%	17.3%	53.1%	7.7%	1.0%
High	31462	26.2%	10.5%	56.0%	5.3%	1.9%

To summarise, higher education should decrease the probability of remaining self-employed in an economic upturn, since self-employment is an inferior choice to wage work and the employment of the highly educated grows faster than that of others. In contrast, in an economic downturn higher education should increase the probability of remaining self-employed, if education indeed improves the ability to comprehend market fluctuations. Moreover, there are less or no alternatives for self-employed in the labour market during a recession. These hypotheses will be tested in the following sections.

4. DATA, VARIABLES AND THE METHOD OF ESTIMATION

We use a sample of rich longitudinal data from 'Labour Employment Statistics' that include virtually all employed persons in Finland. The present paper investigates a sample of individuals who have been small firm owner-managers either in 1990 or 1993 and running firms with less than 10 employees. These individuals are followed until 1992 and 1995, respectively. In other words, the periods of analysis include the years 1990-1992 and 1993-1995. An interesting feature of the data at hand is that information on the sector of the firm and the firm size in terms of the turnover of the firm was also linked with each owner-manager.

Due to data protection laws in Finland, the firm size information can only be obtained as transitions between the size (or turnover) classes. The use of a classified instead of a continuous growth variable causes measurement error in the dependent variable. In other words, for firms whose turnover is initially near the lower limit of the group, even high growth may not result in a rise to a higher turnover class, whereas firms whose turnover is initially near the upper limit of the group tend rise into a higher group even with modest actual growth. Since it is plausible to assume that the observations are evenly distributed within each turnover class, we may argue that the measurement error is classical in nature. This means that the estimates obtained are unbiased but the equation's standard error is higher than in the non-erroneous case. Due to this classification, the present paper investigates whether various factors affect the growth probability, rather than the actual growth rates of firms.

The variables used in empirical analysis are constructed in the following manner. The firm exit equation in 1990 (1993) has the dependent variable:

$Y1 = 1$, if firm operates in 1990 (1993) but ceases operation in 1992 (1995)

$Y1 = 0$, otherwise.

The firm growth equation has the dependent variable:

$Y2 = 1$, if the firm grows in terms of the turnover class in 1990-92 (1993-95)

$Y2 = 0$, otherwise.

Moreover, the probability that a firm will grow is conditional on it having survived in the first place: $\Pr(Y2=1 | Y1=0)$. The independent variables are constructed as follows. The age of owner-managers is classified into four groups, those between 18 and 35 years (reference group), 35-44, 45-54 and 54-62 years. The level of education has three groups. In the first one (reference group), owner-managers have acquired education for no more than 9 years, in the second they have obtained education for 10-12 years, and

the final group has a certain amount of higher education, i.e. at least 13 years of education.

In our data firms are classified into four sectors: services (reference group), manufacturing, construction, wholesale and retail trade. Finally, we have information on the age of firms. If a firm does not operate in 1989 but operates in 1990 (or does not operate in 1992 but operates in 1993), it is considered to be an entrant. If a firm appears in the data a year earlier than the entrants do, then it is a “one-year-old.” The remaining firms are older than these and serve as the reference group.

The self-selection of the self-employed is corrected using a sample of the ‘Longitudinal population census data’ and ‘Labour Employment Statistics’ that, importantly, also include employees and persons outside the labour force. We utilise a one per cent random sample of the population in Finland in 1990 and 1993. The proportion of self-employed in the sample is around 10% in both years.

We have estimated the growth and exit models with and without selectivity correction. The selectivity is taken into account using a version of the Heckman two-step procedure (Heckman, 1979). In the first stage, the selection equation for ‘being self-employed’ is estimated. The following selection equation was used:

$Z=1$, if self-employed

$Z=0$, otherwise.

Various personal and family characteristics were included in the vector of explanatory variables. Results of the first-stage logit models are presented in Table 1 of Appendix 1. Using these results, the selectivity correction term (the inverse Mill’s ratio) was calculated (Table 2 in Appendix 1), merged in the second stage data for different types of self-employed, and used as an additional variable in the firm-success equations that are estimated in the second stage. The basic version of this selection-correction framework is generally known as the Heckit procedure (Heckman, 1979; Maddala, 1983; Greene, 1999).

5. RESULTS

Let us start with a summary of the most important findings. Based on estimations reported below we computed the changes in exit and growth probabilities for firms run by self-employed persons with the highest level of education compared to those with less education during both time periods (Figure 1). Firstly, results show that higher education strongly decreases the exit probability in the recession period. The exit probability for firms run by owner-managers with the highest level of education collapses by 11 percentage points when compared to those run by owner-managers with less education. In the recovery period the effect is the opposite. The exit probability is increased by 8 percentage points for the highly educated owner-manager. Secondly, the effect of higher education on growth probability remains positive in both periods. Compared to the less educated, the growth probability is nearly 5 percentage points higher for the highly educated in the recession period, and over 6 percentage points higher in the recovery period. Finally, selectivity alters the effect of education according to the phase of the business cycle. In recession selectivity decreases the positive effect of education on firm success. In recovery the effects change: selectivity increases the effect of education on both the exit and growth probability.

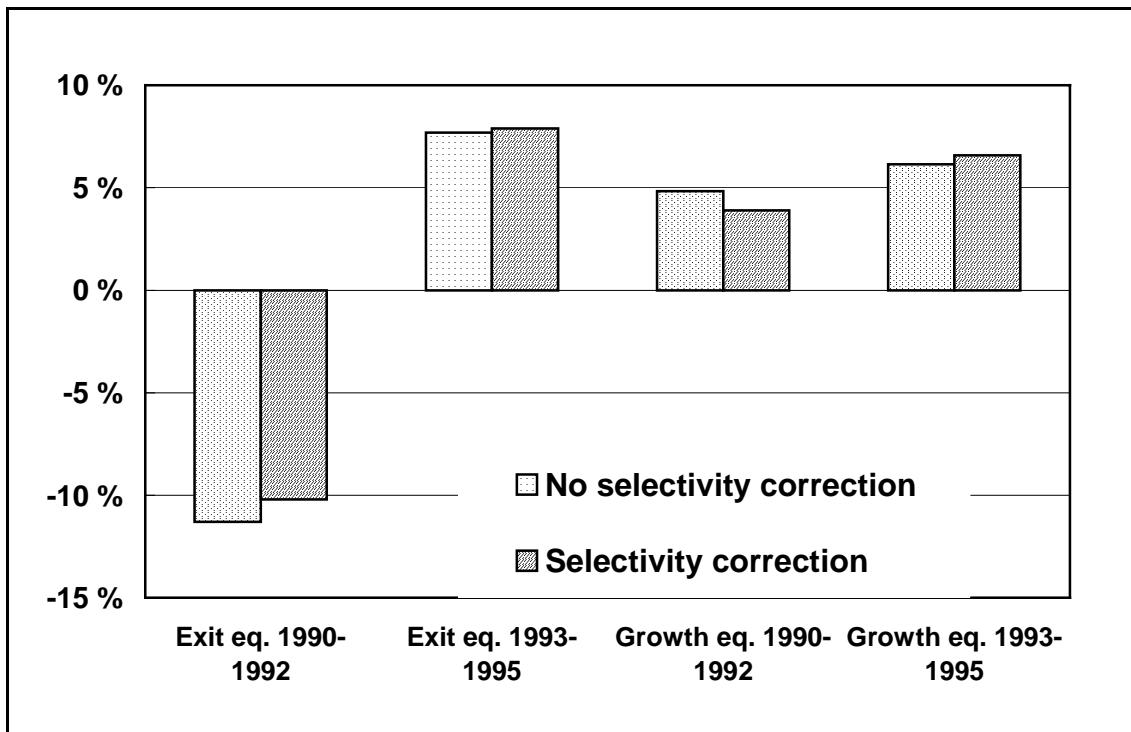


Figure 1. Effect of higher education on exit and growth of firms

The summary of results is based on the following estimations. Firstly, we estimated the probit models for firm exit probability. The results for the recession period (1990-1992) indicate that a higher age of owner-manager reduces the exit probability of the firm up to the age of 54 years, beyond which the exit probability does not significantly differ from that of the 35-year-olds and younger (Table 3). This result accords with our hypothesis that the life-cycle effect applies to the age of owner-managers. Our results also support the life-cycle hypothesis that the failure probability is higher for young firms. Moreover, females tend to exit more often than males. Most interestingly, a higher level of education decreases the exit probability, as expected. We also find that firms in manufacturing have the same exit probability as those in services, whereas firms in construction and those in the wholesale and retail trade had a higher exit probability during the recession.

We also computed separate marginal effects for those with the highest level of education and those with a lower level (not shown in Table 3). In the highly educated group the marginal effects of non-education related variables are smaller in magnitude compared to the group with lower levels of education. This indicates that a higher level of education not only decreases the exit probability but also decreases the effects of non-education variables.

Although the selectivity parameter (λ) is not statistically significant, it does affect the marginal effects to some extent. First, following selectivity correction the age and gender variables become insignificant. The same happens to the manufacturing variable. Secondly, the correction decreases the level of significance of the higher education variable. Moreover, the correction slightly increases the effect of education on exit probability. This implies that once we account for the fact that the self-employed differ from the general population, higher education by itself has a smaller effect on exit probability. Note, however, the rather low level of significance.

Table 3. Marginal effects for the exit model 1990-1992 (number of observations: 6178) and 1993-1995 (number of observations 13808)

Variable	No selectivity correction		Selectivity correction	
	1990-1992	1993-1995	1990-1992	1993-1995
Constant	-0.213***	-0.223***	-0.226***	-0.271***
Age (18-35)				
Age 35-44	-0.063***	-0.057***	-0.072	-0.055***
Age 45-54	-0.071***	-0.085***	-0.082	-0.083***
Age 54-62	-0.004	0.025**	-0.010	0.029**
Gender (male)				
Female	0.039***	0.032***	0.032	0.032**
Level of education (Low)				
Intermediate	-0.031***	-0.013*	-0.030***	-0.014*
High	-0.113***	0.077***	-0.102*	0.079***
Sector (services)				
Manufacturing	0.017***	0.026**	0.017	0.026**
Construction	0.066***	0.055***	0.066***	0.055***
Sales	0.041***	0.063***	0.040***	0.062***
Age of firm (more than 1 year)				
Entrant	0.145***	0.101***	0.145***	0.101***
1 year old	0.100***	0.058***	0.100***	0.058***
Selectivity parameter				
Lambda			0.078	0.026

Notes: The level of statistical significance is marked only in the column named 'all observations'.

* denotes significance at the 10% level,

** denotes significance at the 5% level and

*** denotes significance at the 1% level.

In contrast, selectivity does not affect the results during the recovery period (1993-1995). The results for the latter period are very distinct from those for the recession period in two main respects (Table 3). First, in the latter period the oldest group of self-employed are, in a statistically significant manner, more likely to exit than the youngest ones, and the firms in the manufacturing sector have higher exit probabilities than those in the service sector. Second, a more important change in the results concerns the effects of the level of education on exit probability. In the former period the effect of higher education on exit probability was negative (and significant only at the 10% level), whereas in the latter period having more education leads to a higher exit probability. This result supports our hypothesis that during an economic recovery the labour market improves more for those with higher education leading to higher exit probability, as self-employment is an inferior choice to wage work.

The growth equations only include the firms that survived either of the two-year periods (Table 4), i.e. growth is conditional on having survived. According to the results of the recession period, the negative effect of owner-manager's age becomes stronger the older

the age group in question. Selectivity correction reveals that, in fact, only the oldest age group of owner-managers have a significantly lower growth probability than the youngest group. A higher age of the firm decreases the growth probability, just as it decreased the exit probability. In contrast, there are no differences in the growth probabilities between sectors, whereas there were differences in the exit probabilities.

The effect of education is positive without selectivity correction, but turns to be insignificant when selectivity is taken into account. This result suggests that without selectivity correction the education variable absorbs the effect of ability on the success of firms. The corrected estimates reveal, however, that higher education of the owner-manager alone did not help the firm to grow in the recession.

When the marginal effects are split according to the level of education, we find that each variable has a higher marginal effect in the high education group, indicating that a higher level of education not only improves the growth probability, but also strengthens the effects of other, non-education related variables (not shown in table).

Generally speaking, selectivity alters the levels of significance and signs of variables clearly less during the recovery than in the recession period, a result that also applied to exit probabilities. This suggests that small business owner-managers differed more from the general population at the beginning of the recession than later (Appendix 1). This may be due to the fact that certain types of self-employed persons exited the market during the recession and entered the pool of “other population”, which balanced the characteristics of these two groups.

Table 4. Marginal effects for the growth model 1990-1992 (number of observations: 4972) and 1993-1995 (number of observations: 11253)

Variable	No selectivity correction		Selectivity correction	
	1990-1992	1993-1995	1990-1992	1993-1995
Constant	-0.1533***	-0.1965***	-0.142***	-0.3087***
Age (18-35)				
Age 35-44	-0.0163*	-0.0087	-0.009	-0.0048
Age 45-54	-0.0259**	-0.0243***	-0.017	-0.0184*
Age 54-62	-0.0471***	-0.0629***	-0.042*	-0.0522***
Gender (male)				
Female	-0.0003	-0.0846***	0.005	-0.0845***
Level of education (Low)				
Intermediate	0.0034	-0.0012	0.003	-0.0016
High	0.0484***	0.0614***	0.039	0.0659***
Sector (services)				
Manufacturing	0.0053	0.0605***	0.005	0.0606***
Construction	-0.0272	0.0528***	-0.027	0.0529***
Sales	0.0055	0.0178**	0.006	0.0177**
Age of firm (more than 1 year)				
Entrant	0.0795***	0.1264***	0.079***	0.127***
1 year old	0.0255**	0.0701***	0.025**	0.0704***
Selectivity parameter				
Lambda			0.065	0.0609

Notes: The level of statistical significance is marked only in the column named 'all observations'.

* denotes significance at the 10% level,

** denotes significance at the 5% level and

*** denotes significance at the 1% level.

There is a marked difference in the growth dynamics between the recovery and recession periods (Table 4). Firstly, firms run by females are less likely to grow in the latter period (the effect was not statistically significant in the former period). Secondly, firms in the manufacturing, construction and sales sectors are more likely to grow than those in other service sectors (again, no differences were found in the former period). Finally, and most importantly, the effect of higher education on firm growth turns positive in the latter period. This supports our hypothesis that, among the firms that do survive, owner-managers with higher education have a better ability to comprehend market opportunities in an economic upturn. Somewhat surprising is that the selection correction does not decrease but increases the effect of education on growth in an economic upturn. This implies that, when compared with the general population, the type of ability that makes owner-managers acquire more education is negatively related to the growth probability of firms.

6. CONCLUSION

This paper analysed the effect of education on the success of firms in an economic downturn and the subsequent upturn. We find that the general labour market conditions greatly affect the relative closure rates of small firms run both by highly and less educated owner-managers. However, the exit probability of a firm is lower for the highly educated in the economic downturn, whereas it is higher in the economic upturn. This result is mainly accounted for by two facts. First, self-employment is an inferior choice, particularly for the highly educated, due to lower earnings prospects. Second, the highly educated face higher external demands for their labour than do the less educated, particularly during an economic upturn. In addition, our findings indicate that firms run by highly educated owner-managers have higher growth probabilities than those run by less educated ones, regardless of the market situation.

Empirical evidence has shown that the proportion of self-employment is much lower in Finland than that in most other European countries and the USA (Kanniainen, 1998). Moreover, a recent international survey showed that only 1 in 67 persons is considering the possibility of starting a firm (Autio et al., 1999). Instead, Finns are historically used to working as employees in large corporations. The current policy regime, on the other hand, is in favour of encouraging self-employment, with fancy sounding programmes such as “1995-2005 - The decade of entrepreneurship.” If indeed the aim is to raise the level of self-employment in Finland to a more international level, the results presented here show that there is a definite need to improve the earnings possibilities of the self-employed. This would increase the number of highly educated self-employed. One measure for improving the earnings possibilities of the self-employed would be to decrease the level of taxation in small firms. This would help preserve the self-employment of those already running a firm and perhaps even encourage the formation of further new firms. Moreover, there is recent evidence that such a measure indeed contributes to firm growth (Carrol et al., 2000).

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APPENDIX 1. First stage of selectivity correction framework: Logit models for “being an entrepreneur in 1990 and 1993”.

Table 1: Logit for being entrepreneur in 1990 and 1993

Variable	1990		1993	
	Coefficient	p-value	Coefficient	p-value
Constant	-2.872	0.000	-2.132	0.000
Female	-0.541	0.000	-0.628	0.000
Age under 35	Reference:			
Age 35-44	0.508	0.000	0.255	0.000
Age 45-54	0.752	0.000	0.354	0.000
Age 55+	0.543	0.000	-0.075	0.338
Basic education or less	Reference:			
Secondary education	-0.070	0.097	-0.259	0.000
Higher education	-0.757	0.000	-0.974	0.000
Married	0.476	0.000	0.457	0.000
Size of family	0.166	0.000	0.205	0.000
Lives in Uusimaa	-0.532	0.000	-0.839	0.000
Regional unemployment rate	0.023	0.009	-0.011	0.070
Unemployment duration	-0.424	0.000	-0.377	0.000
N	28 408		27 918	
Log likelihood	-8786.4		-8147.3	
Significance level	0.000		0.000	

Table 2: Mean values of selectivity parameter for different groups in 1990 and 1993

Group	1990			1993		
	Basic education or less	Secondary education	Higher education	Basic Education or less	Secondary education	Higher education
Men:						
Under 35	-0.223	-0.216	-0.125	1.845	1.863	1.533
35-44	-0.367	-0.356	-0.221	1.831	1.772	1.750
45-54	-0.411	-0.399	-0.250	1.682	1.762	1.760
55+	-0.351	-0.359	-0.188	1.710	1.689	1.419
Women:						
Under 35	-0.177	-0.164	-0.110	1.902	1.854	1.750
35-44	-0.277	-0.262	-0.148	1.757	1.781	1.764
45-54	-0.300	-0.291	-0.143	1.755	1.711	1.756
55+	-0.227	-0.238	-0.114	1.628	1.843	1.498
Firm owner averages	-0.326	-0.281	-0.180	1.739	1.794	1.684
Population averages	1.456	1.623	1.904	1.744	1.761	1.778