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THE ROLE OF EDUCATION IN SELF-EMPLOYMENT SUCCESS

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Abstract

This paper analyses the effect of the education of the self-employed on the success of their firms during economic downturn and upturn in the 1990s in Finland. We find that the business cycle affects the relative closure rates of firms run by the self-employed with any level of education. Exit probability is lower for the highly educated during bust, but higher in boom. This is accounted for by two facts. First, running a small firm is argued to be a less attractive choice to wage work particularly for the highly educated due to lower earnings prospects, less stable stream of earnings and the cultural tradition of working in large corporations. Second, the highly educated face a higher outside demand for their labour than the less educated during economic upturn. Finally, we find that regardless of the state of the aggregate economy, firms run by the highly educated have higher growth probabilities than those run by less educated ones.

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

JEL classification: D21, E32, I29

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THE ROLE OF EDUCATION IN SELF-EMPLOYMENT SUCCESS

1. Introduction

Education is traditionally viewed as an investment for the future. There is abundant evidence in every-day life and scientific literature for the fact 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 too much of formal education. There are numerous studies on various links between self-employment, education and the success of self-employed (Chandler and Hanks, 1994; Evans and Leighton, 1990; Holtz-Eakin et al., 2000; Mosakowski, 1993). The paper adds another feature to this research tradition by scrutinising the effect of the level of education on the success of firms run by the self-employed in relation to the developments in the labour market.

We measure the success of these firms (some of which have a few employees) in two ways: the survival and growth of firm. It is presupposed that the smaller the firm, the more the 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 its success. Hence, the most obvious way to study such personification is to analyse self-employed people and their firms; the self-employed person is actually the key capability or constraint on resource acquisition (Brown and Kirchhoff, 1997). The experience, skills and competency are widely regarded as influencing organisational survival and development (Bates, 1998; Westhead, 1995). Entrepreneurs provide a variety of tangible and intangible resources to an organisation (Bloodgood et al. 1996). These include several types of human capital, i.e. general human

capital, management know-how, industry specific know-how and ability to acquire financial capital (Cooper et al., 1994). These resources and assets accumulate throughout their careers and are accrued largely through education and experience (Kats, 1994). Indeed, several studies have found that there is a positive relationship between the resource base of firms – where the owners are in a crucial role – and the probability of venture survival and growth (Cooper et al., 1994; Chandler and Hanks, 1994; Gimeno et al., 1997; Mosakowski, 1993; Westhead, 1995).

In general, higher education of self-employed people should improve the growth opportunities of their firms. This is because higher education improves the ability to comprehend market prospects, resulting in better exploitation of the demand on the market. This is our first hypothesis.

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. It is possible, however that higher education does not necessarily increase the rate of survival. The argument could be based on the fact that even though the success of the firm is certainly of importance for the self-employed, their own labour market success (whether as self-employed or as an employee) is still more important. In other words, we must separate the success of the owner from that of the firm. Thus, in certain circumstances the closing of a firm may not be considered a failure, but it is a result of a better job market offer for the owner. This argument presupposes that wage work is a more attractive choice than self-employment. If self-employment was more attractive alternative to wage work in all circumstances, then we would observe higher survival rates for firms run by highly educated self-employed in every phase of the business

cycle. However, if wage work was more attractive, then the survival rate for highly educated would not necessarily be higher in each phase.

There indeed is some evidence to suggest that self-employment tends to be a less attractive choice compared to wage work, particularly for the highly educated people. First, highly educated persons earn more as employees than they would do as self-employed (Lucas, 1978; Parkkinen, 2000; Uusitalo, 2001; Wilkinson, 1981; You, 1995). This also applies to persons with mere basic education but the earnings difference is much smaller due to lower average wage level of employees with basic education. Second, the stream of earnings is less secure as self-employed than as employee, due to higher inherent risks in operation of small firms compared to large ones or the public sector (Storey, 1994). Taking the higher risk into account the income from self-employment should in fact be even higher than that from wage work, for self-employment to be more attractive than wage work. On the other hand, possible capital gains from self-employment can contribute to the total earnings from self-employment. Finally, the cultural tradition plays a role in our case. Finns are traditionally used to working as employees in large corporations. The firm size distribution is so dominated by large firms that many instances have called for more small and medium sized firms in Finland (Kohi, 2001). When these findings are considered together with a recent labour market trend in which labour demand is more focused on individuals with higher education in most industrialised countries (Bound and Johnson, 1992; Piekkola, 2001), we may observe that higher education of self-employed in fact increases the possibility for closure of their firms. Therefore, our second hypothesis is the following. If general employment in the economy is improving, more often than those with a lower level of education, highly educated people may cease operating as self-employed 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 a highly educated self-employed, rather than less educated, may even have a higher probability of survival, due to the reason explained above.

There is yet another mechanism that causes the observed firm closure rate to be higher for the highly educated. If the growth of firms run by the highly educated is faster than that run by the less educated, 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 highly educated relative to others. Of course, the same result would apply to the less educated if the growth probability was higher for them than for the highly educated. However, if relative growth differences between highly and less educated do not change over different labour market conditions, then it does not bias the result concerning relative closure rates in bust and boom.

We test the hypotheses stated above analysing the success of self-employed and their firms in two periods, economic downturn (1990-1992) and the following upturn (1993-1995). These are excellent periods for our analysis due to strong economic fluctuations. Our data set is a sample of 'Labour Employment Statistics', which contain register data from various official sources. Results show that, regardless of the general economic conditions, the growth possibilities of firms increase with higher education of the self-employed owner. In contrast, the phase of the business cycle tends to affect the relative survival rates of firms run by self-employed with different levels of education. In economic downturn, a higher level of education raises the probability of survival, whereas in economic upturn it actually decreases the probability. We may thus conclude that general labour market conditions determine the

likelihood of firms to stay 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 aggregate change in employment and labour market transitions by the level of education. In section 4, we describe the micro-level data analysed 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 models that shed light to the issues from various perspectives. Literature surveys are provided, *inter alia*, by Bartelsman and Doms (2000), Caves (1998), Sutton (1997 and 1998) and You (1995). For example, in traditional neoclassical models, the size of firms is determined by efficiency (Baumol et al., 1982; Panzar, 1989; Viner, 1932). In analyses of firm size and growth the research question has been whether the growth rate is random (Gibrat, 1931; Simon and Bonini, 1958; Ijiri and Simon, 1977; Evans, 1987a, 1987b; Dunne and Hughes, 1994; Dunne et al., 1988). When compared with these models, equal in importance are also the following: the transaction costs perspective (Coase, 1937); the industrial economics perspective (Marris, 1966); stage models of business development (Scott and Bruce, 1987); the model of the firm lifecycle based on learning (Jovanovic, 1982; Hopenhayn, 1992; Cabral, 1993; Ericson and Pakes, 1995); the strategic management

perspective (O'Farrel and Hitchens, 1988); the resource-based view of the firms (Penrose, 1959 and 1995); and the resource-based view of the entrepreneur (Cooper et al., 1994).

This study builds on the resource-based view of firms, where the growth of firms consists of internal and external resources (Bridge et al. 1998; Cooper, 1993; Davidson, 1991; Gnyawali and Fogel, 1994; Greene and Brown, 1997; Penrose, 1959). The growth of a firm is 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 particular, various types of capital are crucial. These types include human, social, physical, financial and organisational capital (Greene and Brown, 1997; Hart et al., 1997). Studying the relative importance of human versus financial capital in explaining the survival of firms in the UK, Cressy (1996) finds that access to financial capital is determined both by learning that takes place within firms and by different human capital endowments at start-up. There is also evidence to show that human and financial capital of a principal new firm founder can influence venture performance (Bates, 1998; Cooper et al., 1994).

In brief, internal factors determine the success of the firm in the market structured by external factors. For example, barriers to business survival and development may be internal as well as external. It is often the case that entrepreneurs blame external events for failures whilst they highlight internal reasons as being important in case success takes place (Covin and Slevin, 1989).

In this theory context, empirical work has found several factors to determine the success of firms. To be able to test our hypotheses, i.e. analyse the effect of education, we have to control for those other determinants. First of all, there is evidence in favour of the firm life-cycle effect. According to this hypothesis 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 (Caves, 1998; Dunne and Hughes, 1994; Dunne et al., 1989 and 1988; Evans 1987a and 1987b; Geroski, 1995; Mata, 1994; Mata and Portugal, 1994; Sutton, 1997). Our expectation is that this also applies to our Finnish data.

Secondly, we may expect that the life-cycle effect applies also to the age of the self-employed people (Kangasharju, 2001). Younger managers are often more highly motivated than older ones, since they want to test their own abilities. 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. Therefore the hypothesis suggests that firms run by younger 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 self-employed 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 self-employed reaches the age of 50 years, due to early retirement and age related illnesses.

Thirdly, there is a growing literature on the effects of other characteristics of entrepreneur on small firm success (Barkham et al., 1996; Storey, 1994; Kivimäki, 1998; Littunen, 1996). Self-employed people 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 been running a firm already 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 and Baines, 1998; Johansson, 1999). Apart from the effects of age discussed above, we test below whether there are any gender-differences in our Finnish data.

As already mentioned, external factors affect the success of firms, too. Differences in the growth rates of industries result in large differences in inter-industry firm performance. Hence the industry in which a firm operates plays an important role for its growth and survival chances (Beesley and Hamilton, 1984; Kangasharju, 2000; Keeble and Walker, 1994). Actually there is a variety of external factors that determine firm formation and success. Most important of these factors are local demand growth and the presence of other small firms. The presence of other firms serves as seedbed for future entrepreneurs as well as a source of entrepreneurial example, culture and way of life (Reynolds, 1994).

Demand and economic growth are obviously very important, too. 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 in the 1990s

The present paper argues that aggregate labour market conditions affect the closure rates of firms run by self-employed 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 macro-economic 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 obtained from the population census and the Register of Firms compiled by Statistics Finland. Neither of these data is based on questionnaires or interviews, and therefore they do not include information on attitudes, inclinations or other ways of thinking.

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 altogether by some 10%, unemployment rose from less than 4% to nearly 17%, property values practically collapsed and the public sector debt expanded vastly (Honkapohja and Koskela, 1999). The first signs of recovery emerged in 1993. The average annual growth rate of GDP remained at around 5% from 1993 to 2000, 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, 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.

A brief examination of employment streams reveals that self-employed persons (some of which may also have employees in their firms) 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 suggests that self-employment is a less attractive choice to wage work.

To sum up, higher education should decrease the probability of remaining self-employed in economic upturn, since self-employment is a less attractive choice to wage work and the employment of the highly educated grows faster than that of others. In contrast, in 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 alternatives for self-employed in the labour market during 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 self-employed either in 1990 or 1993 or both. Some of them may have had employees. It appears that most of the self-employed in data did work alone, whereas the largest firm had 10 employees. We concentrate on these small firms since we want to study personification of the self-employed people in the success of their firms.

These self-employed individuals are followed until 1992 and 1995, respectively. In other words, the periods of analysis include the years 1990-1992 and 1993-1995. These time periods match perfectly with distinctive phases of the business cycle of the 1990's described above. One limitation, however, is that we do not have information on the location of the self-employed people. Thus, we cannot take into account possible regional differences in the phases of the business cycle. 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 self-employed.

Due to data protection laws in Finland, other information than size and sector of firms were not provided. Hence, firm survival and growth were the only available measures for firm success, though literature could have suggested additional measures (Cooper, 1993; Cooper et al., 1994; Storey 1994). Moreover, the firm size information can only be obtained as

transitions between the size (or turnover) classes. The use of classified instead of continuous growth variable causes measurement error into the dependent variable. In other words, for firms, whose turnover is initially near the lower limit of the group even a high growth may not result in a rise to a higher turnover class. In contrast, firms, whose turnover is initially near the upper limit of their turnover group tend to rise to 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 does not bias the results. This means that the estimates obtained should be unbiased but the equation 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:

$$Y1 = \begin{cases} 1 & \text{if firm operates in 1990 (1993) but ceases operation in 1992 (1995)} \\ 0 & \text{otherwise} \end{cases}$$

The firm growth equation has the dependent variable:

$$Y2 = \begin{cases} 1 & \text{if firm grows in terms of the turnover class in 1990-92 (1993-95)} \\ 0 & \text{otherwise} \end{cases}$$

Moreover, the probability that a firm grows is conditional on having survived in the first place: $\Pr(Y2 = 1 \mid Y1 = 0)$. Both equations were estimated using probit-models.

The independent variables are constructed as follows (description of variables in Appendix 2).

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. We recognise the possibility of using the age variable as continuous. Nevertheless our dummy variable approach is able to capture the same notion of data as age and age squared could have done. This is the possibility that the effect of

age is not linear, but the probability of survival and growth is higher for the “middle aged” (35-44 and 45-54 year-olds) than for the youngest or oldest group of people in data.

The level of education has three groups. In the first one (reference group) self-employed people 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 some amount of higher education, i.e. at least 13 years of education. These three categories correspond to the three levels of schooling in Finland.

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

We have estimated the growth and exit models with and without selectivity correction. Selectivity correction is needed since 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 causes the persons to obtain more education and improves their success in the business. In other words, education of the self-employed is, in a sense, an endogenous variable in determining the growth of his/her firm. Hence the resulting self-selection bias is to be corrected in order to obtain a true effect of education on the firm success that applies also to population that are not currently self-

employed. 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 self-employed people.

The selectivity is taken into account using a version of the Heckman two-step procedure (Heckman, 1979). At the first stage, the selection equation for ‘being self-employed’ is estimated. The following selection-equation was used:

$$Z = \begin{cases} 1 & \text{if self-employed} \\ 0 & \text{otherwise} \end{cases}$$

Since our data include self-employed people only, the first-stage is modelled using another sample of the ‘Longitudinal population census data’ and ‘Labour Employment Statistics’. This sample includes, importantly, also employees and persons outside the labour force. We utilise a one-percent 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.

Various personal and family characteristics were included in the vector of explanatory variables in the first-stage models. Results of the first-stage logit-models are presented in Table 1 in Appendix 1. Using those results, the selectivity correction term (the inverse Mill’s ratio) was calculated (Table 2 in Appendix 1), merged in the second stage with our first data for 24 different types of self-employed (4 age groups times 3 educational groups times 2 gender groups), and used as an additional variable in the firm-success equations that are estimated at the second stage. The basic version of this selection-correction framework is generally known as the Heckit-procedure (Heckman, 1979; Maddala, 1983; Greene, 1999). When there is a binomial non-linear model in both stages, the conventional method of controlling for selectivity is to use the instrumental variable estimator. We do not apply it here, however, due to the obligation to use two separate data sets.

5. Results

Let us start with a summary of the most important findings. Using results reported in Tables 3 and 4, we computed the changes in exit and growth probabilities for firms run by self-employed 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 reversed. 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.

Now, let us turn to discuss the results in a closer detail. We estimated the probit-models for firm exit probability. The results for the recession period (1990-1992) indicate that a higher age of self-employed 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 firm life-cycle hypothesis that the failure probability is higher for young firms. Moreover, females tend to exit more often than males, a result which is somewhat unexpected. Most interestingly, 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 (sales) had a higher exit probability during 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 group of the highly educated, 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.

Though the selectivity parameter (λ) is not statistically significant, it does affect the marginal effects to some extent. First, selectivity correction turns the age and gender variables insignificant. The same happens to the manufacturing variable. Secondly, the correction decreases the level of significance of 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.

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 percent level), whereas in the latter period having more education leads to a higher exit probability. This result supports our hypothesis that, in 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 the two-year period in question (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 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 recession period, a result which also applied to exit probabilities. This suggests that small business owner-managers differed more from general population at the beginning of the recession than later (Appendix 1). This is either due to the fact that the most 'original' self-employed exited the market during the recession and entered the pool of 'other population', which balanced these two groups. The other explanation (perhaps less plausible) is that the recession changed characteristics of the population to better reflect those of small business owner-managers.

There is a marked difference in the growth dynamics between the recovery and the 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 economic upturn. Somewhat surprising is that the selection correction does not decrease, but increases the effect of education on growth in economic upturn. This implies that, when compared with general population, the type of ability, which makes owner-managers acquire more education, is negatively related to growth probability of firms.

6. Conclusion

This paper analysed the effect of education on the success of firms in an economic downturn and the following 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 self-employed, some of which had employees. The main result is that the exit probability is lower for the firms run by 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 a less attractive choice particularly for the highly educated due to lower earnings prospects, less secure stream of earnings and the cultural tradition of working in large corporations. Second, the different behaviour of highly and less educated magnifies in booms, as the highly educated face higher external demand for their labour than do the less educated. In the economic recovery of 1990's in Finland this feature was particularly strong, since the period was accompanied by strong economic restructuring, speeded up by the previous depression, joining to the European Union, deepening globalisation and continuing technical progress. As a note for future research, it would be interesting to see whether or not the result obtained here also applies to other countries with similar socio-economic structure and business culture.

In addition, our findings indicate that firms run by the highly educated self-employed have higher growth probabilities than those run by the 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; Kohi, 2001; OECD, 1998). Moreover, a recent international survey showed that only one 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 certain need to improve the earnings possibilities of the 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 preserving the self-employment of those already running a firm and maybe even encourage the formation of further new firms.

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Table 1**Change in Employment by the 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 of education or less

Intermediate = 10-12 years of education

High = 13 years of education or more

Table 2**Number of Self-employed in 1993 (aged 19-64) by Level of Education and Labour Market Status in 1995**

Self-employed in 1993		Labour market status in 1995				
Level of education:	Number:	Wage work	Unemployed	Self-employed	Out of labour force	Age 65+ or emigrated
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%

Table 3

Marginal Effects for the Exit Model 1990-1992 and 1993-1995

Sample period:	No selectivity correction		With selectivity correction	
	1990-1992	1993-1995	1990-1992	1993-1995
Constant	-0.213***	-0.223***	-0.226***	-0.271***
Age (18-34)				
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 (> 1 year)				
Entrant	0.145***	0.101***	0.145***	0.101***
1 year	0.100***	0.058***	0.100***	0.058***
Selectivity parameter:				
Lambda			0.078	0.026
Number of observations	6178	13808	6178	13808

Notes:

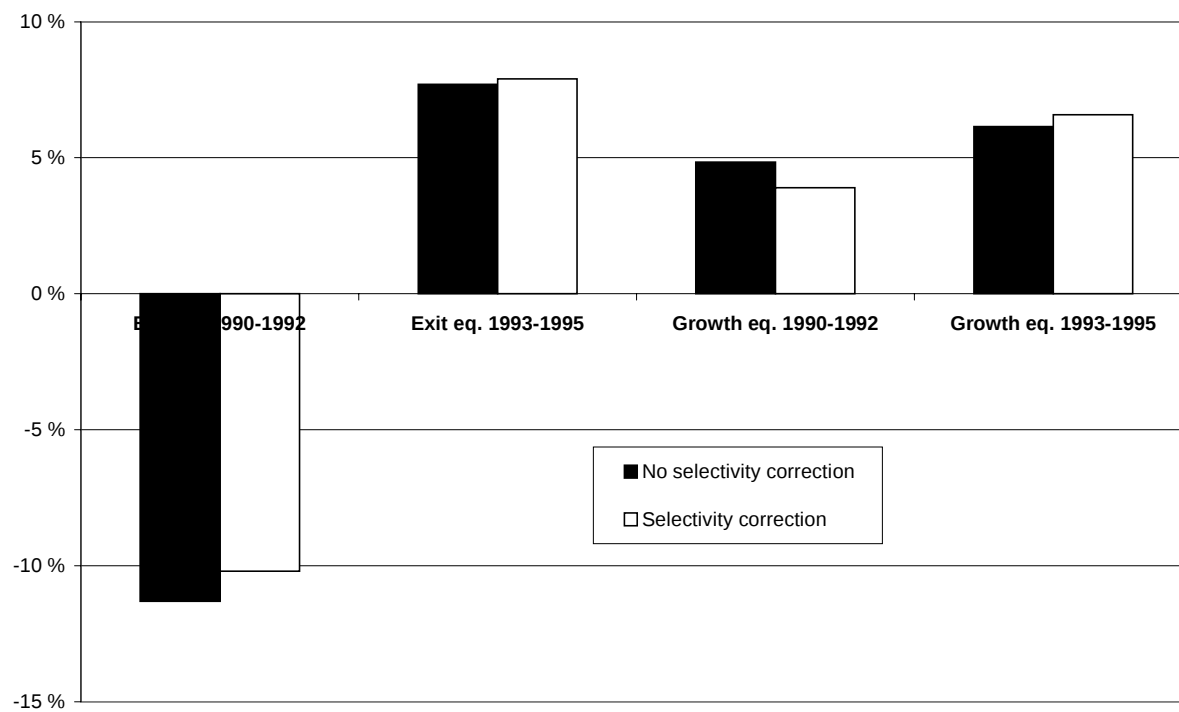
1. Reference groups of variables are given in parentheses.
2. * denotes significance at the 10% level, ** denotes significance at the 5 % level and *** denotes significance at the 1 % level.

Table 4**Marginal Effects for the Growth Model 1990-1992 and 1993-1995**

Sample period:	No selectivity correction		With selectivity correction	
	1990-1992	1993-1995	1990-1992	1993-1995
Constant	-0.153***	-0.197***	-0.142***	-0.309***
Age (18-34)				
Age 35-44	-0.016*	-0.009	-0.019	-0.005
Age 45-54	-0.026**	-0.024***	-0.017	-0.018*
Age 54-62	-0.047***	-0.063***	-0.042*	-0.052***
Gender (male)				
Female	-0.000	-0.085***	0.005	-0.085***
Level of education (Low)				
Intermediate	0.003	-0.001	0.003	-0.002
High	0.048***	0.061***	0.039	0.066***
Sector (services)				
Manufacturing	0.005	0.061***	0.005	0.061***
Construction	-0.027	0.053***	-0.027	0.053***
Sales	0.006	0.018**	0.006	0.018**
Age of firm (> 1 year)				
Entrant	0.080***	0.126***	0.079***	0.137***
1 year	0.026**	0.070***	0.025**	0.070***
Selectivity parameter:				
Lambda			0.065	0.061
Number of observations	4972	11253	4972	11253

Notes:

1. Reference groups of variables are given in parentheses.
2. * denotes significance at the 10% level, ** denotes significance at the 5 % level and *** denotes significance at the 1 % level.

Figure 1**Effect of Higher Education on Exit and Growth of Firms**

APPENDIX 1**Table A1**

First Stage of Selectivity Correction Framework: Logit Model for ‘Being an Entrepreneur in 1990 and 1993’

	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
Number of observations	28408		27918	
Log likelihood	-8786.4		-8147.3	
Significance level	0.000		0.000	

Table A2

Mean Values of Selectivity Parameter for Different Groups in 1990 and 1993

Group	1990			1993		
	Education level:			Education level:		
	Basic or less	Secondary	Higher	Basic or less	Secondary	Higher
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
Self-employed 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

APPENDIX 2

Table A3

Description of Endogenous and Exogenous Variables

Variable	Description	Mean; SD
Endogenous variables		
Survival of firm, 1990-1992	Self-employed and firm appear in data both 1990 and 1992 =1 if survives from 1990 until 1992	0.195; 0.396
Survival of firm, 1993-1995	Self-employed and firm appear in data both 1993 and 1995 =1 if survives from 1990 until 1992	0.189; 0.388
Growth of firm, 1990-1992	Firm's turnover class rises between 1990 and 1992 =1 if grows in terms of turnover class	0.071; 0.257
Growth of firm, 1993-1995	Firm's turnover class rises between 1993 and 1995 =1 if grows in terms of turnover class	0.138; 0.343
Exogenous variables		
<i>Age of self-employed:</i>		
Age (18-34), 1990	Age of self-employed in 1990 =1 if age between 18 and 34	0.180; 0.384
Age (18-34), 1993	Age of self-employed in 1993 =1 if age between 18 and 34	0.209; 0.406
Age (35-44), 1990	Age of self-employed in 1990 =1 if age between 35 and 44	0.388; 0.487
Age (35-44), 1993	Age of self-employed in 1993 =1 if age between 35 and 44	0.353; 0.478
Age (45-54), 1990	Age of self-employed in 1990 =1 if age between 45 and 54	0.278; 0.457
Age (45-54), 1993	Age of self-employed in 1993 =1 if age between 45 and 54	0.319; 0.466
Age (55-62), 1990	Age of self-employed in 1990 =1 if age between 55 and 62	0.135; 0.341
Age (55-62), 1993	Age of self-employed in 1993 =1 if age between 55 and 62	0.119; 0.324
<i>Gender:</i>		
Female, 1990	Female self-employed in 1990 =1 if female	0.361; 0.480
Female, 1993	Female self-employed in 1993 =1 if female	0.333; 0.471
<i>Level of education:</i>		
Low, 1990	Years of education in 1990 =1 if less than 10 years of education	0.480; 0.500
Low, 1993	Years of education in 1993 =1 if less than 10 years of education	0.340; 0.490
Medium, 1990	Years of education in 1990 =1 if 10-12 years of education	0.463; 0.499
Medium, 1993	Years of education in 1993 =1 if 10-12 years of education	0.507; 0.500
High, 1990	Years of education, 1990 =1 if at least 13 years of education	0.057; 0.232
High, 1993	Years of education, 1993 =1 if at least 13 years of education	0.093; 0.291
<i>Sector of firm:</i>		
Services, 1990	Firm in services sector in 1990 =1 if services	0.247; 0.431
Services, 1993	Firm in services sector in 1993 =1 if services	0.555; 0.497
Manufacturing, 1990	Firm in manufacturing sector in 1990 =1 if manufacturing	0.212; 0.409
Manufacturing, 1993	Firm in manufacturing sector in 1993 =1 if manufacturing	0.097; 0.296
Construction, 1990	Firm in construction sector in 1990 =1 if construction	0.062; 0.241
Construction, 1993	Firm in construction sector in 1993 =1 if construction	0.130; 0.337
Sales, 1990	Firm in wholesale/retail trade in 1990 =1 if sales	0.476; 0.499
Sales, 1993	Firm in wholesale/retail trade in 1993 =1 if sales	0.217; 0.412
<i>Age of firm:</i>		
Entrant, 1990	Firm appears in data first time in 1990 =1 if entrant	0.050; 0.218
Entrant, 1993	Firm appears in data first time in 1993 =1 if entrant	0.058; 0.233
1 year, 1990	1990 is second year for firm in data =1 if one-year-old	0.084; 0.277
1 year, 1993	1993 is second year for firm in data =1 if one-year-old	0.063; 0.243
Incumbent, 1990	Firm is older than 1 year old in 1990 =1 if incumbent	0.840; 0.367
Incumbent, 1993	Firm is older than 1 year old in 1993 =1 if incumbent	0.838; 0.368