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EXIT FROM FINNISH INDUSTRY – DOES EDUCATION MATTER?

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ABSTRACT: In this paper we have studied how the probability of exit from Finnish industry evolved in the 1980's and 1990's in different educational groups. In particular, our interest has been in the question to what extent education matters when a job match is dissolved. Our empirical analyses are based on a data set on white-collar workers collected by the Confederation of Finnish Industry and Employers (TT) during the years 1983-1996. Our results show that it is the university education that best guarantees stability of employment in Finnish industry but that the risks of separation do vary among different industries and among small, medium-sized and large firms.

KEY WORDS: labour turnover, separations

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TIIVISTELMÄ: Tässä tutkimuksessa selvitetään, miten todennäköistä 1980- ja 1990-luvulla teollisuuden toimihenkilöiden siirtyminen oman toimialansa ulkopuolelle on ollut ja mikä rooli henkilön koulutustasolla on tässä prosessissa ollut. Empiiriset analyysit perustuvat Teollisuuden ja Työnantajain Keskusliiton (TT) keräämään palkka-aineistoon vuosilta 1983-1996. Tuloksemme osoittavat, että tutkimusajanjaksolla yliopistotason koulutuksen hankkineilla on suurin todennäköisyys vakaisiin työsuhteisiin, mutta että työsuhteen päättymisen todennäköisyys vaihtelee paljon eri toimialoilla ja eri kokoisissa yrityksissä.

AVAINSANAT: vaihtuvuus, työsuhteen purkautuminen

1 Introduction

Firms loose firm specific human capital when employees decide to quit. Employees face threat of earnings and human capital losses when the firm decides to dissolve the job-match. Separations, whether voluntary or involuntary, do not come without costs.[1] In this paper we focus on the effect of education on the separation rate. In particular, we are interested in the role of education as a guarantee for more stable employment. How much lower/higher is the risk of separation among those with higher education? To study this question we use data on white-collar workers in Finnish industry over the period 1983-1996. The chosen time interval includes periods of accelerating growth, economic slump, and gradual recovery.

In previous economic literature it has been shown that separations are usually procyclical.[2] Separation rates may, however, vary substantially in different industries and in firms of different sizes. In this paper we study to what extent these differences are present in Finnish industry.

To evaluate industry and firm size differences on separation rates we use results from logit model estimations in subsequent empirical analyses. By doing this makes it possible to keep the effects of other background variables (such as age and gender) constant. By controlling the effect of other variables in this way we can get "pure" industry and firm-size effects on exit rates, which do not depend on age and gender differences in the sample. This guarantees that even though separation rates do vary among men and women and in different age groups this does not blur our conclusions about the underlying differences in the risks of separation between different industries and firms of different sizes.

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[1] See, for example, Becker (1992), Jovanovic (1979) or Oi (1962) for literature on job turnover.

[2] See Anderson and Meyer (1994).

2 Data and empirical model

In analysing separations we focus on the probability that when a job match dissolves an employee has a certain educational level. In particular, we study how this probability changes with different background factors. The data set has been gathered by the Confederation of Finnish Industry and Employers (TT) during the period 1980-1996. The sample is restricted to white-collar workers. It can be regarded to be representative in manufacturing sector. In subsequent empirical analyses we focus on four periods that roughly correspond to different phases of the business cycle in Finnish economy:

1) Steady growth during the years1983-1986.
2) Accelerating growth during the years1987-1990.
3) Deep recession during the years1991-1994.
4) Beginning of recovery in 1995.[3]

The sample of individuals to be included in empirical analyses is restricted to those whose job match dissolved during the observation period, i.e. who either quitted their jobs voluntarily or who were sacked from their jobs. The data set does not allow us to separate voluntary and involuntary separations from one another. In Table 1 the number of separations and their relative share with respect to all employees are reported for the four observation periods.

Table 1. Sample size

	Number of separations	Relative share of separations
		%
1983-1986	4979	13
1987-1990	6140	16
1991-1994	5797	19
1995	1020	13

[3] Our data set extends to year 1996 but we did not have information on those employees who exited from Finnish industry in 1996. To calculate separations for the year 1996 would have required data from 1997.

It appears from Table 1 that separation rate was highest during the recession (between the years 1991-1994) suggesting that the increase in layoffs was then larger than the drop in voluntary separations. According to this result separations appear to be countercyclical. However, during the period of accelerating growth (between the years 1987-1990) separation rate was higher than in periods of less rapid growth. This suggests that separations have also some procyclical features. All and all these results indicate that the cyclical properties of separations are somewhat blurred in Finnish industry.[4]

In modelling the probability that a person exiting from Finnish industry has a certain educational level multinomial logit model is used. The model is based on the assumption that exits between different educational levels are independent from one another. We allow for three classifications:

1) Exiting person has only a basic education.[5]
2) Exiting person has a secondary education.
3) Exiting person has a university education.

The probability that a person j with an educational level s (s =2,3) exits can be written as follows:

$$(1) \qquad \Pr(I_j = s) = \frac{\exp(z_j \alpha_s)}{1 + \sum_{k=2}^{3} \exp(z_j \alpha_k)} \ ,$$

where z_j represents the vector of factors that influence the probability that a jth individual with an educational level s exits from Finnish industry, α_s represents vector of parameters for educational level s. In order to identify the parameters s=1 (only a basic education) is chosen as a base case i.e. it is assumed that $\alpha_1=0$. The model is estimated using maximum likelihood method.

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[4] Separations are often found to be procyclical, see Anderson and Meyer ((1994).

[5] If there was no information on the educational level of the sample individuals we have included them into this group.

Both demand side and supply side factors influence the above exit probabilities. In general, the decision to dissolve a job match can be made by the employee, by the employer or by the joint decision. Therefore, the estimated multinomial logit model can be regarded as a reduced form model capturing the combined effect of all these types of decisions. The included background variables are as follows:

Individual characteristics:

1) Age
2) Gender

Firm characteristics:

3) Industry
4) Firm size.

In estimations the above variables appeared to be statistically highly significant explanatory factors for the observed separations.[6] Further, the null hypotheses that the explanatory variables do not have any influence on the observed probabilities were strongly rejected in all samples. This is also reflected in the high values of t-statistics that most of the variables received in estimations. Let us next discuss these results in more detail.

3 Results

Table 2 gives an overall picture of the skill distribution of persons who exited from Finnish industry during the observation period. Figures presented in the table are calculated from the estimation results of the logit models and are evaluated at the mean values of explanatory variables and, thus, represent average shares in all samples.

[6] More detailed information about the results are available from the authors.

It appears from Table 2 that between the years 1983-1986 about 27 per cent of employees who exited from Finnish industry had a basic education. During1995-1996 this share had dropped to 11 per cent. On the other hand, the share of employees with either a secondary or a university education has been increasing steadily among those who exited. These results are due to the ongoing process of skill upgrading in Finnish industry. To be able to say whether higher education has guaranteed a more stable career in Finnish industry one needs to look at relative risks of separation in each educational group.[7] In other words, we need to see if the separation rate is higher or smaller (in proportion) than the average share of persons in each educational group would allow for.

Table 2. Skill distribution of separations

	Basic education	Secondary education	University education
	%	%	%
1983-1986	27.02	56.07	16.91
1987-1990	22.70	58.90	18.40
1991-1994	18.80	59.10	22.20
1995	11.10	63.30	25.60

In Table 3 relative risks of separation for different educational groups are reported. It appears from the table that the risk of separation is higher among those with a basic education and a secondary education and lower among those with a university education. Between the years 1983-1986 this risk was 4 per cent higher for basic education and 8 per cent higher for secondary education. For university education the exit rate was 24 per cent lower than the relative share of employees with university education would suggest it to be. Thus, it appears that a university degree does guarantee more stable employment in Finnish industry than other qualifications do.

Table 3 shows that the deep recession in the early 1990's did not change much the relative risks of separation in different educational groups suggesting that all employee

[7] A relative risk can be obtained by dividing the shares presented in Table 2 by the average shares among all the employees. A relative risk equals one when the separation rate equals the average share in the population.

groups were equally hit by the slump. In 1995 the relative risk of separation among those with basic education declined to a value less of one, which meant that, for the first time, the share of employees with basic education did not decrease.[8]

Table 3. Relative risk of separation

	Basic education	Secondary education	University education
1983-1986	1.04	1.08	0.76
1987-1990	1.04	1.10	0.74
1991-1994	1.03	1.10	0.79
1995	0.78	1.14	0.85

Table 3 gives us an overall picture of the relative risks of separation over time. It does not, however, reveal how and to what extent this risk has evolved in different types of firms. In this section we focus on two firm-level characteristics; industry and firm size. Relative risks for each industry and firm size are calculated using estimation results from the logit models.

In evaluating the effects of industry and firm size on separations we have calculated separation risks so that the effects of other background variables are controlled for. We calculate separation risks for a reference person who represents an average person in the sample in terms of age, gender, and industry or firm size, respectively. By controlling for other background variables in this way we can reveal “pure” risks of separation for each industry and firm size, which do not include the effects that the other control-variables have on the probability of separation.

[8] In 1995 no more than 14 per cent of employees in Finnish industry had only a basic education. This share was 26 per cent between the years 1983-1986.

Industry effects

Let us first see how the relative risk of separation varied among different industries between the years 1983-1986. Table 4 shows that the risk of separation among employees with a basic education was highest in construction and in metal industry: the risk of separation was over 20 per cent higher than the share of employees. In graphic industry, on the other hand, the exit rate among those with a basic education was 11 per cent lower than the share of employees suggesting that career stability among these employees is exceptionally good.

Table 4. Relative risk of separation by industry, 1983-1986

Industry	Basic education	Secondary education	University education
Graphic	0.89	1.12	0.83
Chemical	1.03	1.07	0.84
Consultant	1.12	1.16	0.85
Metal	1.20	1.12	0.66
Forest	1.00	1.01	0.96
Construction	1.26	1.02	0.78

Table 4 shows that the relative risk of separation is over one among employees with a secondary education in all industries. This means that the relative share of employees with this education has declined over the observation period. Further, among employees with a university education the relative risk of separation remains below one. In this group the lowest risk is in metal industry and the highest risk is in forest industry.

Voluntary separations tend to rise and involuntary separations decline with growing economic activity. Table 5 presents relative risks of separation by industry during a period when Finnish economy grew with an accelerating rate between the years 1987-1990. It appears that among those with a basic education the relative risk of separation increased only in chemical industry compared with the previous period. In forest industry and in construction the relative risks of separation rose among those with a secondary education. In graphic, chemical, and metal industries the relative risks of separation rose

among employees with a university education. However, on the whole, it appears that only in a limited number of industries did voluntary separations rise more than involuntary separations declined.

Table 5. Relative risk of separation by industry, 1987-1990

Industry	Basic education	Secondary education	University education
Graphic	0.87	1.06	1.08
Chemical	1.10	0.95	1.02
Consultant	1.09	1.17	0.85
Metal	1.20	1.11	0.72
Forest	0.81	1.11	0.83
Construction	1.12	1.09	0.73

During recession voluntary separations usually decline and involuntary separations rise. People try to hold on to their jobs the best they can. It appears from Table 6 that between the years 1991-1994, when there was a slump in Finnish economy, relative risks of separation changed only little in different industries. The general picture remained the same, and there seems to be no indication that certain educational groups were hit by the recession more severely than the others.

Table 6. Relative risk of separation by industry, 1991-1994

Industry	Basic education	Secondary education	University education
Graphic	0.97	1.01	1.04
Chemical	1.19	1.09	0.75
Consultant	0.87	1.13	0.93
Metal	1.15	1.13	0.78
Forest	1.18	1.02	0.79
Construction	1.01	1.16	0.68

In 1995 Finnish economy started its gradual recovery from recession. It appears that increasing job opportunities rose the relative risk of separations in some groups of employees. Table 7 shows that the sharpest rises occurred among consultants and in

construction. Among consultants it was those with a basic education and in construction it was those with a secondary education who exited in large numbers. Employees with a university education had higher than average exit rates in graphic and forest industries.

Table 7 shows, further, that in 1995 there were relatively many industries in which unskilled employees had a low risk of separation. This result may reflect the fact that skill upgrading, which has reduced drastically the number of unskilled employees in Finnish industry over the years, is shifting towards the upper end of the skill distribution. In metal industry and among consultants, however, the relative risks of separation among unskilled employees were higher than ever.

Table 7. Relative risk of separation by industry in 1995

Industry	Basic education	Secondary education	University education
Graphic	0.86	1.03	1.10
Chemical	0.84	1.19	0.77
Consultant	1.90	0.91	0.95
Metal	1.21	1.17	0.74
Forest	0.37	1.08	1.12
Construction	0.28	1.46	0.48

Firm size effects

Let us next study whether employment stability has been different in small, medium sized or large firms in Finnish industry. As was the case in studying the industry effects subsequent analyses on firm size are based on the estimation results of the multinomial logit model in which the effect of other factors have been controlled for. The figures to be presented below are evaluated at the mean values of age-, gender-, and industry indicators.

In Table 8 relative risk of separation by firm size is presented for the period 1983-1986. It appears that among unskilled employees the relative risk of separation is lowest in small

firms and highest in large firms. Otherwise the separation rates seem to follow similar patterns in different sized firms.

Table 8. Relative risk of separation by firm size, 1983-1986

Firm size	Basic education	Secondary education	University education
Small	0.96	1.07	0.79
Medium	1.01	1.05	0.87
Large	1.11	1.05	0.84

Table 9 shows that the situation did not change dramatically during the years 1987-1990 when the economy grew rapidly. Among employees with a secondary education the relative risk of separation rose somewhat, most likely due to the fact that new job opportunities in the labour market increased the number of voluntary quits.

Table 9. Relative risk of separation by firm size, 1987-1990

Firm size	Basic education	Secondary education	University education
Small	1.03	1.12	0.78
Medium	0.96	1.08	0.78
Large	1.05	1.07	0.81

It appears from Table 10 that in small firms the recession hit employees with a university education more than the others; their relative risk of separation rose sharply. Otherwise the slump seems to have caused only minor changes in the relative risks of separation among different employee groups. The figures indicate that, for example, unskilled employees did not have more than their proportionate share in exits from Finnish industry.

Table 10. Relative risk of separation by firm size, 1991-1994

Firm size	Basic education	Secondary education	University education
Small	0.93	1.01	1.03
Medium	0.94	1.09	0.84
Large	1.03	1.10	0.79

Table 11 shows in 1995, when the economy had started its gradual recovery, the risk of separation dropped among unskilled employees in all firm sizes. It appears that the long-term trend to diminish unskilled labour force has ended. Time will show if this is a temporary phenomenon or not.

Table 11. Relative risk of separation by firm size in 1995

Firm size	Basic education	Secondary education	University education
Small	0.77	1.20	0.76
Medium	0.68	1.13	0.90
Large	0.82	1.09	0.93

4 Summary

In this paper we have studied how the probability of exit from Finnish industry evolved in the1980's and 1990's in different educational groups. In particular, our interest has been in the question to what extent education matters when a job match is dissolved. Our empirical analyses are based on a data set on white-collar workers collected by the Confederation of Finnish Industry and Employers (TT) during the years 1980-1996. Our results show that it is the university education that best guarantees employment stability in Finnish industry but that the risks of separation do vary among different industries and among small, medium-sized and large firms.

The separation rate was highest at the beginning of 1990's when the Finnish economy plunged into a deep recession. The separation rate was also higher than average during a

period of accelerating growth in the late 1980's. These results suggest that the cyclical properties of separations are somewhat blurred in Finnish industry.

Over the 14-year observation period the relative risk of separation was largest among employees with a secondary education and lowest among those with a university education. In 1995 the relative risk of separation among unskilled employees dropped drastically. For the first time the share of employees with only a basic education did not decline in Finnish industry. This result may reflect the fact that skill upgrading, which has reduced drastically the number of unskilled employees over the years, is shifting towards the upper end of the skill distribution.

Our results suggest that graphic industry has provided most stable employment prospects for employees with only a basic education. Forest industry has been in this respect best for those with a secondary education and construction for those with a university education.

Employees with a university education had the lowest relative risk of separation in small firms (except during recession). Those with a secondary education had best possibilities for stable employment in large firms (except during recession). What comes to employees with a basic education it seems that for them medium-sized firms have been the best option regarding employment stability over the whole observation period.

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