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REGIONAL DIFFERENCES IN OVEREDUCATION

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ABSTRACT

This paper focuses on overeducation from the regional perspective. The supply of highly educated workers has increased since the late 20th century but the demand has not necessarily increased equivalently. This mismatch might create problems at the labour market, for example unemployment and overeducation. Individuals are not totally mobile and prefer to search for a job near their residential location. If accessible jobs do not correspond to the educational level of the job seeker, he or she may have to accept a job below his or her educational level. Spatial mismatch between jobs and workers has been noticed in several studies (see e.g. Büchel & van Ham 2003). Spatial mobility of workers, migration and commuting, can reduce spatial mismatch.

The aim of this paper is to find out whether there are regional differences in the proportion of overeducated labour force. Finnish micro level data are used in the analysis. The sample consists of 149 908 individuals who were employed in 2000. Overeducated workers are identified with a statistical measure.

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1 INTRODUCTION

The supply of highly educated workers has increased since late 20th century has not necessarily been matched by the demand for them. Approximately 11 000 university degrees were completed in 1990 rising to 18 300 in 2004. During the same period another sector of higher education, polytechnics, was created. In the year 2004 almost 21 000 qualifications were awarded in the polytechnics. In total, 25 % of the population over 15 years of age had a higher education degree in Finland in 2004. (Statistics Finland)

The theory of human capital forms the framework for this study. The theory of human capital seeks to explain income differences. Human capital consists of the knowledge, skills and experience which a person can acquire. Education is an investment in human capital. (Becker 1962.) Sometimes a worker fails to make full use of his or her human capital. When a worker has a job that requires less education than he or she has, that worker is defined as overeducated.

Several explanations for overeducation have been offered. First, since education is only one part of person's human capital, an overeducated worker might have less experience (Groot & Maassen van den Brink 2000). An alternative explanation is offered by the career mobility theory (Sicherman & Galor 1990). The theory states that at the beginning of the career a person might accept a job below his or her educational level with the aim of moving to a higher position later. The signalling theory is one explanation for overeducation. Spence (1973) constructed a model where an employer cannot know the productivity of a worker before hiring him or her and uses education as a proxy measure of ability. With the increasing number of degrees education as a signal has become heterogeneous and can vary, for example, according to university (Dolton & Vignoles 1997). Empirical studies have found that young workers are overeducated more often than experienced workers (see Sicherman 1991). On the other hand, some examples show that overeducation can also become a permanent situation (see Dolton & Vignoles 2000).

Yet another explanation of overeducation, and the main focus of this study, is spatially limited job search area. Jobs and workers are unevenly located across space; this leads to spatial mismatch. Although highly educated individuals and their jobs are concentrated in the biggest cities, some employees have a job which does not match their educational level.

Frank (1978) suggested that both spouses seldom get the best job offer in the same location when a family may decide that a woman searches for a job in a certain area. Limited job search area can cause overeducation although individuals minimize the degree of overqualification. (Frank 1978.) In general, an individual searches for a job in a local labour market. If a job that matches his or her educational level is not found, he or she has to decide whether to accept a job which requires less education or be unemployed. An alternative is for the individual to move to another labour market area, which may enhance his or her chances of finding a job. (van Ham 2002.) The regional aspect of overeducation has been examined in several studies (see e.g. Büchel & van Ham 2003; Sanromá & Ramos 2004; Hensen & de Vries 2004).

People who have invested in human capital tend to move to cities because cities offer them a better return on their investment. This concept was introduced by Sjaastad (1962). He described migration to another region as an investment. Maximisation of future income and migration decisions are the theoretical foundation of the concept of the regional concentration of human capital. (Sjaastad 1962, 80-93.) When people with higher education prefer to live in the biggest cities, human capital concentrates in them. Human capital plays a crucial role in regional development. As human capital flows into a region, productivity rises, the labour market becomes more efficient and stimulating the increased flow of information and innovations in that region (Simon 1998; Moretti 2004).

The aim of this study is to describe regional differences in overeducation in Finland and to find regions where the risk for overeducation is high. Because of the concentration of the Finnish population, especially people with higher education, in the big cities, it is important to analyse the educational mismatch in different regions. The paper discusses if it is profitable for highly educated workers to be concentrated in a few central regions.

Previous studies are reviewed in the next section. In section 3, the statistical measure of overeducation is defined. Finnish micro-level data are used to describe the regional differences in section 4. In addition, mobility and other characteristics of overeducated workers are presented. Section 5 concludes.

2 PREVIOUS STUDIES

2.1 Measuring overeducation

Overeducation has been measured in different ways in previous studies. Measures can be subjective or objective. When overeducation is measured subjectively, workers evaluate the required level of education for their jobs (see e.g. Sicherman 1991). The subjective method gives up-to-date information about a specific job. However, the ability of individuals to assess their own jobs varies (Hartog 2000). Objective measures can be divided into two types. An objective evaluation of the education required in a certain occupation, a job analysis, can be used to classify overeducated workers (see e.g. Halaby 1994). Job analysis gives clear descriptions but a detailed analysis is expensive and time-consuming, and can result in outdated knowledge (Hartog 2000). The other type of objective measure is called statistical or empirical measure.

Statistical measures are drawn from the distribution of levels or years of education within an occupation and they have no theoretical justification. Statistical measures can be constructed in two ways. First, workers can be identified as overeducated or undereducated if their years of education depart more than one standard deviation from the mean in the occupation in question (see e.g. Sanroma & Ramos 2004). The other option is to define workers who have the mode value of education as adequately educated and the others as over- or undereducated (see e.g. Kiker et al. 1997). Statistical measures have many disadvantages and they are considered inferior to job analysis or subjective evaluation. Statistical measures do not describe the required skills of a certain job and they cannot be directly compared with other measures because statistical measures describe the realised matches. It has been noticed that by the standard deviation procedure the proportions of undereducated and overeducated workers are similar. If education followed a normal distribution, the tails, in other words under- and overeducated, would be about 10% to 15% of the sample. (Hartog 2000.)

Bauer (2002) investigated wage effects of educational mismatch. Two statistical measures were utilized to define overeducated individuals. The final sample of German panel data consists of 1 824 males and 922 females and 18 637 person-year observations in total. Occupations were defined in 2-digit level and occupations which had less 10 observations per year were excluded from the data. The mean index categorized 12% of males and 10% of females as overeducated while 10% of males and 12% of females as undereducated. The percentages of overeducated and undereducated were

quite symmetrical. As was predicted, the mode index gave higher percentages of educated and undereducated workers. Among males, 31% were overeducated and 21% were undereducated and for females 30% were overeducated and 37% were undereducated. (Bauer 2002, 221-225.)

2.2 Overeducation and space

The spatial aspect of overeducation in the Netherlands was investigated by van Ham (2002). The study discussed the concept of underemployment, which included unemployed, overeducated, discouraged and involuntary part-time workers. One of the research questions was to what extent spatial differences in job access explain underemployment. Workplace mobility, career advancement and occupational achievement were examined. The results showed that finding a job that matches person's educational level was difficult in the periphery. Amsterdam and surroundings did not fit in the overall pattern because finding a high level job was difficult in that area. One offered explanation may be a fierce competition between highly educated workers. (van Ham 2002, 1-11, 35-49.)

Regional labour market characteristics and individual restrictions were analysed with German data. Büchel and van Ham (2003) linked overeducation to the available employment opportunities. Overeducated individuals were identified with a subjective measure. They applied a two-step method to control for selection bias and analysed the probability of being employed and probability to be overeducated for the employed. It was observed that women with children had a higher risk to be overeducated than men and childless women. Spatial flexibility decreased the risk of overeducation although the high-level job may increase the spatial flexibility because of a better opportunity to own a car. The regional unemployment rate did not affect overeducation. Researchers concluded that the level of competition, in other words the unemployment rate, in a local labour market was more crucial factor in avoiding unemployment than the size of the labour market. (Büchel & van Ham 2003, 482-491.)

Büchel and Battu (2003) tested the differential overqualification hypothesis. They used German panel data to observe differences in overeducation by gender and labour market area. They determined whether a worker is overeducated by a subjective measure. The evidence showed that married women in small labour market areas had a higher risk to be overeducated than unmarried women and men. The effect of commuting was also studied. Married women living in smaller areas had longer commuting distances than married women living in urban areas. Overeducated married

women had shorter commuting distance, so they were more spatially constrained than married women whose education matched their jobs. (Büchel & Battu 2003, 1-16.)

Hensen and de Vries (2004) researched overeducation and geographic mobility in the Netherlands using a school-leaver survey from the Netherlands. The hypothesis was that more mobile individuals would have lower probability of mismatch between job and education. Several types of mismatch were defined: job below educational level, job outside the field of study, flexible job, and part-time job. They used a subjective measure to identify overeducated individuals. Respondents reported the required level of education for their job, which was then compared to respondent's educational attainment. The binary logit model, interaction effects and multinomial logit model were the statistical methods used. According to the results geographic mobility reduced probability of education-job mismatch. In general, mobility increased the probability of finding a permanent and full-time job, and reduced the risk of overeducation, especially for highly educated individuals. (Hensen & de Vries 2004, 5-12.)

Sanromá and Ramos (2004) examined overeducation in local labour markets. They used survey data and measured overeducation statistically. They utilised Heckman's two-step procedure to control for selection bias (see Heckman 1979). The probability of being employed was estimated first. Then, the probability of being overeducated was estimated with Heckman's lambda added. They examined the influence of several characteristics on overeducation and found out that gender had no effect on overeducation when other characteristics were controlled. However, the main findings described the effects of regional factors on overeducation. Living in a small town increased the probability of overeducation. On the other hand, possibilities to search for a job in a wider area, such as a private car and a road network, decreased the probability of overeducation. (Sanroma & Ramos 2004, 7-14.)

In summary, several studies have noticed that spatial aspects can explain overeducation. Reviewed studies are mainly telling the same story; spatially constrained individuals living in small labour market areas had a higher risk to be overeducated. Mobility increased changes to find a job that matches the educational level. However, one study (van Ham 2002) observed that the supply of young highly educated individuals in a central region was so big that it was difficult to find a job which requires higher education.

3 DATA AND METHOD

3.1 Finnish micro-level data

Finnish micro-level data are used in the empirical analysis. The data are a 7 % random sample drawn from the Finnish census in 2001. Information from labour registers and municipal and regional statistics is combined with the census data. These data contain information about education, work, place of residence, and family from the year 1975 to 2002.

The 149 908 employed individuals in the year 2000 were chosen from the original data for this study. In the extracted sample 51,6 % are men and 48,4 % are women. The average age is 41 years and youngest individuals are 15 years old and the oldest are 74 years old.

The level of education is the key variable in this study. There are six educational levels: basic education, secondary education, low tertiary education, bachelor's degree, master's degree and postgraduate degree. The percentages of different levels are presented in table 1.

TABLE 1 Levels of education in the sample

	n	%
basic	34 171	23
secondary / vocational	64 735	43
low tertiary	26 526	18
higher education (bachelor's) / polytechnic	10 452	7
higher education (master's)	12 755	9
postgraduate	1 269	1
all	149 908	100

3.2 Statistical measure

Data availability determines the method of measurement. Therefore, for this study the statistical method was chosen. Micro-level register data do not contain subjective evaluations about the educational level required for the job and an objective job analysis is not available for Finnish occupations.

For statistical measure, educational levels had to be converted into years. The standard length of education was used because the data do not contain information about the number of years an

individual has actually spent in education. Conversion is not straightforward because the education system has undergone a number changes during past five decades. These changes have been taken into account to a certain extent. Nowadays basic education lasts nine years; however, older citizens have attended school eight, seven or six years. The standard length of secondary and vocational schools is three years after basic education. The vocational training has been very diverse in the past and old vocational qualifications were converted into 10 years of education. Education lasted in total 14 years for those individuals who have low tertiary education. Individuals with higher education degrees have completed 16 (Bachelor's), 17 (Master's), 19 (medical doctor) or 21 (postgraduate) years of education. Due to changes in the education system the mean procedure of statistical measure is better for Finnish data than the mode approach. During the decades the ways to get qualifications for occupations have varied.

Occupations were defined with a 5-digit code by the European version of ISCO (International Standard Classification of Occupations) from the year 2000. Occupations are classified according to type of tasks and required skills (Statistics Finland). Occupations with less than 100 observations were combined with the nearest occupational group. Altogether 246 occupations resulted. The number of observations per occupation averaged 600. The biggest occupation, salespersons, has 7205 observations and the two smallest groups, each with 100 observations, were managers in small firms in the agriculture and forestry and workers of chemical industry.

Means and standard deviations of years of education were calculated for every occupation. Individuals were defined as overeducated or undereducated if their years of education differed more than one standard deviation from the mean within an occupation. Those who had more than one standard deviation from mean fewer years of education than average are defined as undereducated and those who have over one standard deviation more years of education as overeducated.

There are number of problems with the statistical measure. The measure is, by definition, dependent on the distribution of years of education and does not reveal anything about the use of skills in a certain occupation. Overeducation is drawn from the distribution and in some cases it can be misleading. Problems occur in occupations with a small number of observations. In occupations which require fewer years of education the distribution tends to narrow and a substantial proportion of workers are classified as undereducated. In these cases the length of basic education (9 years) can be below the limit of undereducation. Despite these problems, the statistical measure is an adequate

way to classify overeducated and undereducated workers when the aim is to determine the regional pattern of overeducation.

4 EMPIRICAL FINDINGS

According to statistical measure 9,6% of the sample were overeducated and 17,9% were undereducated. The percentage of overeducated workers is slightly lower than in studies from other European countries (see e.g. Bauer 2002). The proportions of overeducation and undereducation are not entirely symmetrical; in fact, undereducation is a more common situation than overeducation.

To analyse regional differences in overeducation regional categories are needed. There were 85 regions in Finland in 2000. These regions were divided into four groups based on their size and type. The metropolitan area consists of the Helsinki region and the three smaller neighbouring regions. In 2001 approximately 1,39 million people lived in the metropolitan area. In the group of the big university cities Tampere is the largest region with over 300 000 inhabitants and the smallest is Vaasa with 88 000 inhabitants. The remaining urban regions form the group of other cities of which the largest region is Lahti with 168 000 inhabitants. Small regions are mainly rural or sparsely populated.

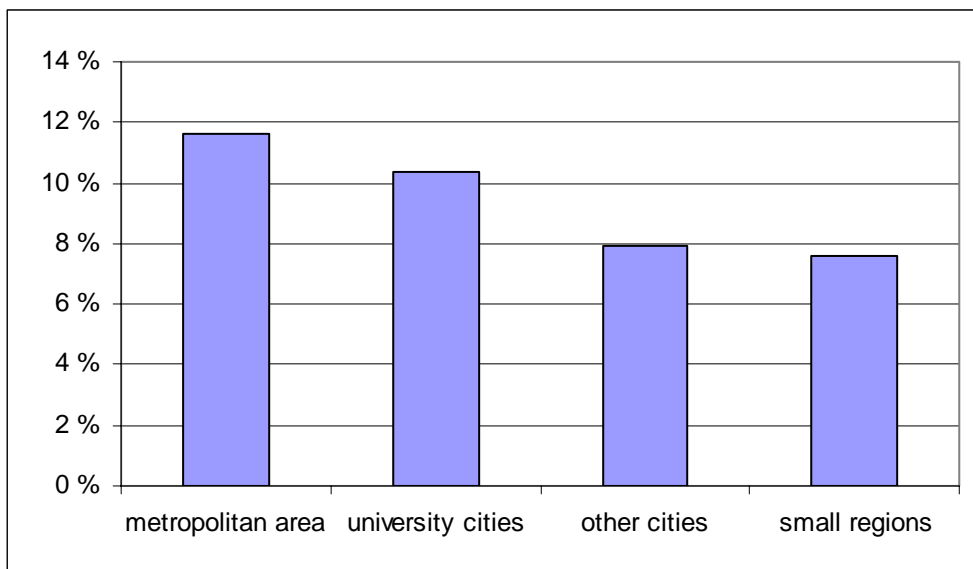


FIGURE 1 Percentage of the overeducated in four region categories

The percentages of overeducated workers in different regional categories are shown in figure 1. The percentage of the overeducated is above average in the metropolitan area and in the university cities

and below average in the groups of other cities and small regions. Regional differences in the proportion of overeducated workers are statistically significant because value of chi-square with 6 degrees of freedom is 734,7, which is far bigger than the critical value at the 0,01 level.

TABLE 2 Percentages of overeducated by region group and years of education

	years of education		all
	>14	14	
metropolitan area	38 %	18 %	11,6 %
university cities	32 %	21 %	10,4 %
other cities	27 %	25 %	8,0 %
small regions	27 %	31 %	7,6 %
all	33 %	23 %	9,6 %

Table 2 presents a wider picture: percentages of overeducated workers are calculated separately for those with 14 years of education and for those who have more than 14 years of education. Among those who have more than 14 years of education 38% are defined as overeducated in the metropolitan area. The percentage of overeducated workers is lower in the other regional categories. When individuals with exactly 14 years of education are examined, the picture is different. The percentage of overeducated workers is highest in small regions and lowest in the metropolitan area.

TABLE 3 Percentages of overeducated by variables

variable	class	%
gender	man	9,2
	women	9,9
age	under 25 years	5,2
	25 – 34 years	15,0
	35 – 44 years	10,3
	45 – 54 years	7,4
	over 55 years	6,4
family type	single	10,0
	couple	9,4
	couple with children	9,5
moved during 1995-1999	no	8,8
	yes	15,8
commutes	no	9,1
	yes	10,5

Proportions of overeducated workers by gender, family, age, moving, and commuting are reported in table 3. The percentages of overeducated workers do not vary substantially according to gender and family type. Women and singles are slightly more often overeducated. The proportions vary by age as was expected. Among 25-34 years old workers 15 % are defined as overeducated. Mobility

variables, moving and commuting, describe an unexpected picture. Proportion of overeducated workers is higher among movers and commuters. One explanation for these findings is that highly educated individuals usually migrate more often than people with less education (see e.g. Haapanen 2003) and intuitively, overeducation is higher among workers who have higher education. This does not totally explain the observed percentages because movers are overeducated more often than those who have not moved among highly educated workers also.

5 CONCLUSION

Some workers encounter a situation where they have more education than is needed for their current job. This situation, in other words overeducation, has been explained with many different theories. One of them states that overeducation occurs because the job search area is limited. In addition, highly educated individuals prefer to live in big cities where there are a greater number of available jobs.

Overeducated and undereducated workers are identified using a statistical measure. In total, 9,6 % of all workers are classified as overeducated and 17,9 % as undereducated. The results also show that there are regional differences in overeducation. The highest proportion of overeducated workers is found in the metropolitan area and the lowest proportion in the category of small regions.

If the proportions of overeducated workers are analysed by the level of education, the pattern is different. Among workers with 14 years of education, the percentage of overeducated workers is the highest in the small regions and lowest in the metropolitan area. This result is in line with the theoretical framework and the results of previous studies. Among workers who have over 14 years of education, the metropolitan area turns out to be the most difficult region to get a job which matches a higher education. As the result of regional concentration of highly educated workers the overeducation is a common incidence in the metropolitan area. Although the proportion of overeducated workers is lower outside metropolitan area, highly educated workers may prefer to take a lower job in the metropolitan area in the hope of finding a better job later. It may be that individuals believe that their chances of finding a high-level job are better in the metropolitan area because most jobs are located in that area.

Mobility characteristics were also examined. The results show that spatial mobility does not necessarily enhance chances to find a job which matches the level of education. It may be that these

overeducated movers have migrated to the metropolitan area and commuters commute to the metropolitan area where the overeducation is a common phenomenon. Overeducated movers and commuters are interesting because their decisions do not seem rational.

This study illustrates regional differences in overeducation with Finnish register data. However, a deeper analysis is needed to identify the regional and personal characteristics explaining overeducation. The estimation method of analysis has to take sample selection bias into account. Further research might also provide more information about the overeducated movers and commuters. Another interesting theme to investigate would be the regional consequences of overeducation. Are the overeducated workers a growth potentiality or does a region fail to utilize their human capital and hinder its economic growth?

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