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Tertiary graduates in low-wage jobs in Sweden 2003–2012

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ABSTRACT

Based on Swedish register data from 2003 to 2012, this study attempts to explain over-education and upward mobility among tertiary graduates. Rarely used explanatory factors are central in the analyses, such as 'still in study' and 'field of education'. Tertiary graduates in low-wage jobs are regarded as over-educated. The results of this work suggest that the general increase in graduates correlates well with the increase in over-educated graduates. Many of those who were categorised as over-educated were students, and graduates from some specific fields were particularly vulnerable to working in low-wage jobs. Sixty per cent of the graduates found more suitable jobs, while up to 40 per cent stayed in jobs related to lower wages. Graduates from fields associated with higher risks of over-education were also less likely to experience upward mobility. The increasing occurrence of over-education among graduates may not only result in a substandard utilisation of human capital (and absence of social mobility), it also seems that the presence of large numbers of over-educated graduates in low-paid work may have implications for unskilled workers, through displacement effects.

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Over-education; tertiary graduates; mobility; low-wage jobs

Introduction

Historically, education has been an aspect of human capital closely related to labour market success, which is probably one explanation behind the dramatic increase in the uptake of tertiary education in recent years. For example, in Sweden, the number of bachelors´ degrees has doubled in 10 years (Statistics Sweden 2014a). However, at the same time as the numbers of graduates have grown, research shows that the match between education and labour market position has weakened (see, for example, Goldthorpe 2014). It has become increasingly common that tertiary graduates perform low-skilled jobs or have jobs with wages much lower than the expected graduate salary (see, for instance, Le Grand et al. 2013; Universitetskanslerämbetet 2013; Verhaest and Van der Velden 2013; Goos, Manning, and Salomons 2009; Tåhlin 2007). This phenomenon can be expressed in terms of 'over-education'.

It is not clear why this 'over-education' has become increasingly common among tertiary graduates, and possible explanations can be attributed to the demand for, and supply of, highly skilled workers. Perhaps if the demand for highly skilled workers is lower than the supply, the surplus skilled workers will need to find work in the unskilled sector, and from that position compete for better positions in the skilled sector. An imbalance such as this, in the demand side of the labour market, where skilled workers are forced to take unskilled jobs (Borghans and de Grip 2000) may help to explain the phenomena of over-education in some countries. In the Swedish labour market, the share of jobs requiring shorter tertiary education has been relatively constant in recent years, but the share

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of jobs that require special competence has increased from around 15 per cent in 1997 to around 20 per cent in 2012 (own data, appendix, Figure A1). At the same time as the demand for highly educated has increased in the Swedish labour market, the number of highly educated in low-wage jobs has also grown. Given these two phenomena, it seems reasonable to attempt to identify the reasons for over-education in the supply side of the labour market. Statistics show that the number of tertiary graduates increased over 24 years, by almost 40 per cent between 2000 and 2012, or from 1.4 million graduates to more than 1.95 million (SCB 2013; Table 2). Based on this information, over-education could be a result of the increasing number of graduates in general, or it may be linked to some fields of higher education, which has experienced a proportionately large increase in graduates. Another seemingly obvious explanation for over-education could relate to the relatively large number of graduates who continue to study at a higher level after graduation (yearly around 25 per cent according to own data). If they are unwilling to incur additional study loans, for economic reasons, low-wage jobs should attract this group. It is possible that it is more common for post-graduates to take on low-wage jobs while undertaking further studies, which could at least partly explain the increase in over-educated graduates in the Swedish labour market.

To undertake low-wage jobs while studying can appear uncomplicated as such. The question is whether these graduates can subsequently move on from these lower paid positions, or if they are trapped in low-wage jobs for long periods. Related to the question of mechanisms behind over-education is the question of the expected consequences of the phenomena. Previous research has indicated that over-education can be persistent over time due to, for instance, the fewer career paths related to these lower paid positions and that over-educated workers have less access to both formal and informal on-the-job training (see, for instance, Thurow 1976; Baert, Cockx, and Verhaest 2013; Büchel and Mertens 2007; or for results based on Swedish data Korpi and Tåhlin 2009). Seen from this point of view, human capital investment among the over-educated who undertake postgraduate education could have positive effects on upward mobility because they have access to formal training.

In this study, I search for alternative explanations for upward mobility among the over-educated, one being study activities while in low-skilled jobs. Other explanations for upward mobility may relate to the general increase in the supply of graduates, and/or to variations depending on the field of education. Further, I will also control for other factors related to individual characteristics. Many previous studies have examined over-education in terms of wage outcomes, or how the functional level of a worker's job exceeds the educational level (Baert, Cockx, and Verhaest 2013). This study uses an alternative strategy to catch different types of jobs that the over-educated have, and whether they eventually transfer from a job for which they are over-educated to a better matched job. Though wage effects are relevant, the wage distribution varies between employees doing the same type of job, due to variation in experiences, employers' expectations of productivity and/or individual characteristics. This is something that can complicate studies about over-education and mobility behaviour. Therefore, in this study, the focus is on the employees' jobs instead of their individual wages in the prediction of over-education and upward mobility. In order to undertake this study, Swedish register data were used, where I follow recent graduates from 2003 to 2012.

Aim

Previous research has demonstrated that over-education is common and may persist over time. In this study, I repeat the questions of earlier studies: *what explains over-education and what explains the opportunity of upward mobility for the over-educated?* New (or rarely used) explanatory factors of over-education are central in the analyses, such as 'still in study' and 'field of education'. I also use an alternative definition of over-education. Jobs with low educational requirements are based on the median wage level of the job, which means that highly educated people in jobs normally associated with low wages are regarded as over-educated. For the purpose, Swedish register data are used. The data set includes the entire population and provides the relevant information for several years. This enables not only to make necessary selections but also to study mobility patterns in a long-term perspective.

Theory

The premise of economic theory is that the higher the education level a person has attained, the greater the likelihood of labour market establishment and social mobility (see, for instance, the human capital theory, Becker (1993) or Treiman (1970) regarding theory on social mobility). This is reasonable, especially when jobseekers´ levels of education range from unqualified to qualified, and when the labour market demand for both unqualified and qualified workers matches the supply of both skilled and unskilled workers. However, when a large proportion of highly educated individuals are competing for the same job, an increasing number will enter jobs for which they are over qualified, in terms of both tasks and wages. Under such circumstances, traditional economic theories will not be able to entirely explain why highly educated people become over-educated, nor explain their upward mobility behaviour.

To understand the matching process, and the premise of over-education, the job competition model (Thurow 1976) can complement these standard economic theories. The job competition model focuses on mechanisms that determine how jobseekers are matched against jobs, and how potential employers screen the job queue for individuals who signal productivity. Here, the labour market is divided into two queues. Employers create a queue of all vacancies ranked by wage. The second is created by jobseekers, which is ranked particularly according to human capital, from those who have no education or experience up to the highest educated and those with most experience. The best possible match is made between these. In general, the jobseeker will first and foremost match her/himself against the vacancies according to human capital (education and/or experience). If this does not succeed within a reasonable time, she/he will start looking for vacancies that require somewhat lower qualifications and lower salaries, and over time move even further down in the queue for unskilled jobs with much lower salaries. This is when the jobseeker, according to human capital, will be over-qualified for the job and thus over-educated.

Employers who search for workers are basically expected to act similarly to the jobseeker. Formal qualifications are crucial, especially if employers are adding a vacancy that requires a high degree of qualification. However, when many possess the same qualifications employers will screen the job queue and search for attributes that signal high productivity, beyond both level and direction of education. Exactly what these could be is not expressed in the model and has to be derived from the context. To take an example, gender may be one such, at least in the study of young workers. That is, if potential employers´ expectations are that young female workers will be periodically absent from work due to family formation, gender can signal lower productivity.

Previous studies on over-education and mobility behaviour

Over-education occurs when individuals have been educated to a higher level than their job requires, and in the Western world, an increasing number of young workers are over-educated according to this definition, at least at the beginning of their careers (see, for instance, Battu, Belfield, and Sloane 1999; Dolton and Vignoles 2000). However, there are great variations in outcomes both between and within countries, according to differences in the level and orientation of worker's human capital. While some report over-education as a temporary problem for most workers (Robst 1995; Sicherman 1991; Sicherman and Galor 1990), a large number of studies have found that over-education constitutes a persistent problem for many young people. To give some examples of over-education as a problem, Verhaest, Schatterman, and Van Trieer (2015) find that almost 40 per cent of young over-educated remained over-educated for at least 7 years, and according to Baert, Cockx, and Verhaest (2013) over-education is a trap where the monthly transition into better matched jobs decreases significantly. Based on Swedish data, Korpi and Tåhlin (2009) studied the impact of this educational attainment mismatch on wages and wage growth in Sweden, and concluded that over-education generates wage penalties, from which the over-educated do not recover. Similar phenomena have been identified by both Hartog (2000) and

Bauer (2002). While several of these studies measure over-education through wage penalties and earnings (Korpi and Thålin 2009; Rubb 2003; Bauer 2002; Hartog 2000), there are also a number of examples that come to similar conclusion about penalties of over-education, despite the use of alternative measures. For example, Allen and van der Velden (2001) found over-education to result in lower job satisfaction, and De Grip et al. (2008) noticed skill erosion among this group. However, as will be highlighted below, several aspects reflect the extent to which the over-educated suffer from penalties, and these are related both to the human capital they possess, as well as to their individual characteristics.

Until recently, studies reported that level of education played a great role for the risk of over-education, where lower educated have been more exposed to over-education than higher educated (Pollman-Shult and Büchel 2004). This may still be the case, but current studies increasingly indicate the highly educated as over-educated, and furthermore, they also remain over-educated for their job positions for long periods of time (Verhaest and Van der Velden 2013; Dolton and Vignoles 2000). While the level of education is less able to predict labour market positions, the orientation of education may play an increasing role. The scope of studies that focus on the impact of occupational orientation is small but one relatively new is by Verhaest and Van der Velden (2013). This work indicates that occupational orientation is significant for the probability of over-education, at least among those who have a tertiary graduate education. They studied the occurrence of over-education among the tertiary educated who graduated 1999/2000. The respondents (with representation from 13 European countries and Japan) were categorised as over-educated if they stated that their job did not require a tertiary qualification. This was the case for 26 per cent of the respondents in their first job after graduation, but the variation was large across countries. It was also found that graduates with a generally oriented education faced a higher likelihood of over-education, compared to those with a vocational education in their first job after graduation. Despite this, those graduates could use over-education as a stepping-stone into a well-matched position later on in their career, to a larger extent than graduates with a more specific career-oriented education. The authors conclude that specific programmes can provide an entry ticket to the labour market, while more general programmes are favourable in order to develop their work career, when seen from a longer time perspective.

Apart from human capital-related variables, individual characteristics are important both in the prediction of over-education, as well as the prediction of mobility from over-education. However, there is a large variation both in terms of the extent to which workers are over-educated, and in terms of their mobility behaviour. When it comes to gender differences, the results diverge. Some find women to have lower incidence of over-education than men (for instance, Hartog 2000; Verdugo and Verdugo 1989), while others find that the women are more exposed both to over-education and to a higher risk of downward mobility (Rubb 2014; Verhaest, Schatterman, and Van Trieer 2015). When examining the specific examples from Sweden, however, studies report that there are small or no significant effects between gender and job match, at least not among the tertiary educated (Universitetskanslerämbetet 2013; Grannas and Oscarsson 2001). More unanimously, results are reported regarding the relationship between ethnic minorities and over-education. Ethnic minorities have a higher risk of being over-educated (Verhaest, Schatterman, and Van Trieer 2015; Rubb 2014; Böhlmark 2003; Battu and Sloane 2002; Grannas and Oscarsson 2001), even if more recent studies indicate significantly weaker effects. Furthermore, older workers are less likely to be over-educated than younger workers (see, for instance, Rubb 2003; Groot and Maassen van Den Brink 1996), and depending on the outcome variable, the parental level of education also has a statistically significant effect on over-education, where school leavers with highly educated fathers are less likely to be over-educated in their jobs (Verhaest and Omey 2010).

Data

The selection

To predict over-education and to study mobility behaviour among tertiary graduates micro-level longitudinal register data from the 'Longitudinell Integrationsdatabas för Sjukförsäkrings- och Arbetsmarknadsstudier' (LISA) has been used. Data were collected from different registers and compiled by Statistics Sweden (SCB). LISA provides enough cases to make the required selections, and its long-term perspective is necessary when studying mobility behaviour of over-educated. Data have been pooled from 2003 to 2012 and before the necessary selections were made, data totalled 90,000,000 observations. To predict over-education, only tertiary graduates up to 35 years of age were selected. Tertiary graduates include all those with a Swedish citizenship, who have accomplished a post-secondary level education of at least 2 years[1]. The upper age limit was set to make sure that the selection group would be a reasonably young group who have accomplished tertiary education in recent years. Another reason was to ensure that they would still be in the labour market by the end of the study period 10 years later. After these selections were made, the population amounted to almost 5,000,000 observations. In the study of mobility behaviour, only individuals up to 35 years of age who graduated from tertiary education in 2003, and were considered over-educated in their jobs 1 year later (in 2004), were selected. This selection amounted to over 19,000 individuals, who then were followed from 2005 until the final year of the study in 2012.

Over-education

The central variable is over-education. Since the focus in this study is on jobs and the theoretical point of departure is taken from the job search model, I have used a measure of over-education that refers to the type of job of the over-educated. The reason herby is to not capture individual wage differences that occur within most types of jobs. It is common that individuals doing the same type of job have different incomes as a result of variations in different sectors, individual characteristics, etc. If individual wages had been central such variations would have been captured. This is why individuals, based on their wages, have been categorised into different groups that distinguish themselves by performing different types of jobs. All individuals in this study are highly educated but performing jobs that do not demand their level of educational skills. Thus, without doubt all individuals are for sure overeducated. When these overeducated individuals experience mobility they move from unskilled jobs to jobs that require more skills, regardless of their individual wages. Examples of such jobs and how the categorizations were made are explained below.

Workers were treated as over-educated if they had accomplished a tertiary education but had jobs in the lowest job wage group. As soon as they left the job in the lowest job wage group for jobs in any of the higher job wage groups, they were considered to have experienced upward mobility.

The cut-off point of the lowest job wage group were all jobs that employed approximately 20 per cent of the employees who had jobs related to the lowest wages (ranged according to their median wages). In contrast, the highest job wage group contained about 20 per cent of employees who had jobs related to the highest median wages. In more detail, the job wage groups were estimated according to the following: with the data pooled from 2003 to 2012, all wages were recalculated to constant value. The median wage was then calculated for each of the occupational groups according to the Swedish Standard Classification of Occupations (SSYK 96, three-digit level) and the occupational groups were then ranked according to its median wage. In the next step, each occupational group was filled with employees. The number of employees in the occupation with the lowest median wage was summed to employees in the occupation with the next lowest wage and so on. This cumulative scale made it possible to divide the employees into five rather equal groups (job wage groups 1–5) ranging from the 20

per cent of the employees in jobs related to the lowest median wages (the lowest job wage group) to the 20 per cent of the employees in jobs related to the highest median wages (the highest job wage group). This measure was created by Åberg and has been used in various ways in his studies (see, for instance, Åberg 2013, 2015).

Tertiary graduates can have jobs related to relatively low median wages (for example, some teachers, or some occupations in the healthcare sector), while at the same time many unskilled workers have jobs related to relatively high median wages (for example, in the construction sector). In such circumstances, the lower and higher educated can overlap in, for instance, the third wage group, where both groups are correctly matched from the perspective of their job. To ensure that I capture only the poorly matched, it is safe to restrict the study to tertiary graduates with jobs in the lowest job wage group. In the lowest job wage group, people were employed in jobs within the restaurant trade, service, cleaners, healthcare, maids, window cleaners, etc. Thus, tertiary graduates in jobs in the lowest job wage group were actually extremely over-educated.

Predictors of over-education

An individual's human capital is usually measured through their level of education, but in this study it refers to field of study, as well as study activities after tertiary graduation. Field of study is detailed according to the two-digit level by SCB (SUN2000Inr) and amounts to 24 different fields (see Figure 3 in the results). Study activities after tertiary graduation refer to cases when tertiary graduates continue with further education after graduation. If individuals were registered in such studies, the year after graduation, they are 'still in studies'. It could be any area of education but in reality, these were almost exclusively education at university level.

Apart from the human capital variables, some are also used in order to measure the impact of personal characteristics for the probability of having a low-wage job. According to the Job concurrence model, potential employers screen the job queue beyond the meritocratic ideals when many in the queue hold the same formal merits. In this study, sex, age, region of birth and parents' human capital are controlled for. In other studies, all of these have been found to predict over-education or have had implications for upward mobility. The first personal attribute relates to sex (man, woman). Young female jobseekers may especially signal lower productivity for some employers, due to expected family formation reasons. Such expectations can restrict females to low-paid jobs, regardless of their level of education. Statistics also shows a general overrepresentation of female workers in part-time jobs (SCB 2014a) and part-time jobs are often offered in the low-wage sector. Age has been recoded into a number of dummy variables (–27, 28–31, 32– years) when predicting over-education. In the second section, age is continuous because the Cox regressions allow continuous variables. The regions of birth are Sweden, the Nordic countries together with EU15 and North America. In general, individuals from these countries were most likely to be in Sweden for work, something they had found upon arrival. This group is not expected to be in low-wage jobs to any greater extent than Swedes. The other groups are Europe (other than EU15), Asia, Africa and South America (together with Oceania, Soviet and unknown). People from these regions are more likely to have immigrated to Sweden for other reasons than job opportunities, to a larger extent than the Nordic/EU15 group. They are also expected to have a more troublesome period in the process of labour market establishment, due to, for instance, labour market discrimination. Finally, the parental level of education is divided into lower secondary, upper secondary, post-secondary <2 years, post-secondary 2 years or more, and unknown. The parental level of education is usually intended to predict children's level of education, but studies have shown that parental education can also predict over-education. This study focuses on individuals who accomplished the highest possible level of education, but it is relevant to find out whether parental education can have any impact on the risk over-education and mobility behaviour. Descriptives of all the variables used in the regressios are presented in Table 1.

Table 1. Summary statistics of all variables used in the empirical analyses. Variables.

	Values	MCA Analysis % (*N*)	Cox regression % (*N*)
Dependent			
Likelihood of entering low-wage jobs		13.0 (577,358)	
Hazard rate; leaving low-wage jobs between 2005 and 2012			83.0 (16,089)
Independent			
Field of education	Arts and media	3.1 (148,714)	
	Humanities	4.6 (222,909)	
	Social and behaviour science	7.8 (380,218)	
	Law	0.4 (21,014)	
	Healthcare	6.4 (313,046)	
	Social work	4.1 (200,768)	
	Personal services	0.9 (45,563)	
	Security	0.0 (1511)	
	Unknown	0.8 (41,335)	
	Fields of medium/lower risk	71.8 (3,493,431)	
Field at risk	Yes		42.0 (8139)
	Now		58.0 (11,240)
Still in studies	No	74.1 (3,608,964)	36.8 (7135)
	Yes	25.9 (1,259,545)	63.2 (12,244)
Sex	Man	42.8 (2,084,756)	29.0 (5613)
	Woman	57.2 (2,783,753)	71.0 (13,766)
Age	−27	32.6 (1,586,814)	
	28–31	33.3 (1,621,261)	
	32–	34.1 (1,660,434)	
	Continuous (years)		M = 25 Sd = 3 Min 21 Max 34
Region of birth	Sweden	86.2 (4,194,781)	92.1 (17,839)
	Nordic, EU15, North America	3.5 (172,460)	1.6 (311)
	Other Europe	3.5 (172,398)	1.9 (375)
	Asia	4.9 (237,637)	3.0 (578)
	Africa	0.8 (40,978)	0.5 (106)
	South America, Oceania, Soviet, unknown	1.0 (49,997)	0.9 (170)
Parental level of education	Lower secondary	5.4 (261,884)	6.2 (1195)
	Upper secondary	32.1 (1,561,479)	33.4 (6468)
	Post secondary less than 2 years	17.6 (856,113)	17.5 (3401)
	Post secondary 2 years or more	34.4 (1,673,274)	38.1 (7383)
	Unknown	10.6 (515,759)	4.8 (932)

Methods

The empirical section includes two types of regressions. To predict over-education, a Multiple Classification Analysis (MCA) was applied. The MCA displays the effect of each independent variable after adjustments for inter-correlations between the independent variables. The advantage of MCA over a multiple regression is that it does not assume linearity of the regression, and it allows a dichotomous dependent variable. When the dependent variable is dichotomous, and the values range from zero to one, the grand mean refers the likelihood of an occurrence (in this study the probability of having a low-wage job). The MCA displays both the bivariate coefficients (empirical deviation) and the multivariate coefficients (adjusted deviation). These coefficients are to be interpreted as the over/under representation (percentages) from the grand mean. In addition, the MCA also gives information about the ETA (related to the empirical deviation) and BETA (related to the adjusted deviation). These two measures show the relative importance of respective independent variable (ETA) and in competition with others (BETA). For a detailed description of the statistical content and procedure, see for instance Andrews, Morgan, and Sonquist (1973).

In the second section, the focus is on mobility behaviour of over-educated and for the purpose a Cox regression was used. It is a suitable approach when making use of longitudinal data and when the goal is to measure both the occurrence of an event (if the over-educated leaves the low-wage

job) as well as the timing of an event (when the over-educated leaves the low-wage job). This technique also enables to study the impact of a number of independent variables that may determine the probability to transfer from one position to another. The advantage of a Cox regression over other regression models is also that the Cox regression accommodates censored cases. This is important since not all cases will experience a transfer from one job wage group to another during the time period 2005–2012. The cox regression model is specified according to the following:

$$h(t) = h_0(t) \times e(b_1x_1 + b_2x_2 + \ldots)$$

The hazard function *h(t)* estimates the rate of event, in this case when individuals leave the low-wage job for a job in any other job wage group. The independent variables *(x)* influence the dependent variable (the hazard). In this study six independent variables are used ($x_{1\ldots}\, x_6$). *(b)* is the regression coefficient (the logarithm of the hazard ratios of event occurrence) and *(e)* is the base of the natural logarithm. The baseline hazard function *($h_0(t)$* is when the value on *x* is 0 (the odds ratio of leaving the lowest job wage group without the independent variable). In the cox regression table (Table 3), both the B-coefficient and ExpB are displayed. ExpB is the hazard ratio and represents each individual's unique risk of event occurrence each year from 2005 to 2012. In a Cox regression, the general assumption is that the hazard ratio is proportional over time. That is, the model calculates the relative risk of event occurrence unrelated to time. Because data represent the entire population, the standard errors (SE), related to their b-coefficients, are therefore displayed instead of significance levels. For a detailed statistical description, see for instance Singer and Willet (2003)

Results

Over-education

Why are young tertiary graduates increasingly represented in jobs with very low wages? In 2003, the proportion of graduates who had low-paid jobs was around 11 per cent, and in 2012 this figure had increased to about 14 per cent (Figure 1). On review of the data, it becomes clear that some occupations were particularly prevalent among tertiary graduates in low-wage jobs. Around 55 per cent were found to work in restaurants as waiters/waitresses and bartenders. Another 15 per cent

Figure 1. Unemployment levels (Employment office statistics 2016), graduates up to 35 years and graduates up to 35 with jobs in job wage group one. 2003–2012.

worked in customer service roles (salespersons and receptionists), and 10 per cent worked in the cleaning sector. This was the case in both 2003 and 2012.

The distribution in Figure 1 shows that along with the increase in the total number of tertiary graduates, and at times relatively high unemployment levels, the number of tertiary graduates in low-wage jobs also increased between 2003 and 2012. The proportion of graduates in low-wage jobs varied most of all with the proportion of tertiary graduates in general (correlation 0.86), rather than fluctuations in unemployment rates (correlations 0.53 respective 0.50). This correlation is better described in Figure 2, which illustrates how the overall increase in tertiary graduates also increased their representation in low-wage jobs.

Something derived from data (but not shown here) is that as many as about 50 per cent of new graduates in low-wage jobs were registered in education, almost exclusively at university level. The considerable number of graduates still in education may answer the question why tertiary graduates had low-wage jobs. However, even if education activities can explain to a large extent why over-education among graduates is so common, these do not explain the increase in the proportion of graduates in low-wage jobs (as shown in Figure 1). This is being said because the actual increase was mainly based on graduates who were in full-time work (non-students), while the number of graduates still in education remained relatively stable over time (Figure 2).

Previous research has identified how different types of tertiary education (general or specific) can have impact on over-education (Verhaest and Van der Velden 2013) and the aim of this study is to complement earlier findings insofar that it investigates in more detail how different fields of education impact the likelihood of over-education. Figure 3 illustrates the relative representation of graduates in low-wage jobs within each field of education (two-digit level) and it becomes clear how the proportion of graduates in low-wage jobs varies between these. A number of fields associated with a larger risk crystallise. It is especially prevalent among graduates from arts and media (21 per cent), humanities (26 per cent), social and behavioural sciences (19 per cent), law (25 per cent), healthcare (23 per cent), social work (26 per cent), personal services (20 per cent), security (21 per cent) and not least within unknown (40 per cent). All these fields were significantly above the average grand mean (13 per cent). One could imagine that the pass rate of students from these fields was particularly high during this period, which would explain the higher risk of over-education. However, using statistics from SCB (2014b) there is no clear relationship. There certainly was an extraordinarily high increase in graduates from humanities and social/behavioural sciences, as well as law studies (the increase was around 50–60 per cent between 2003 and 2012), but statistics also show much smaller increases, or even decreases, in graduates from other fields, when compared with the 'low-risk fields'. We can also derive from Figure 3 that the large number of graduates still in education was proportionally similarly dispersed within each area of the field.

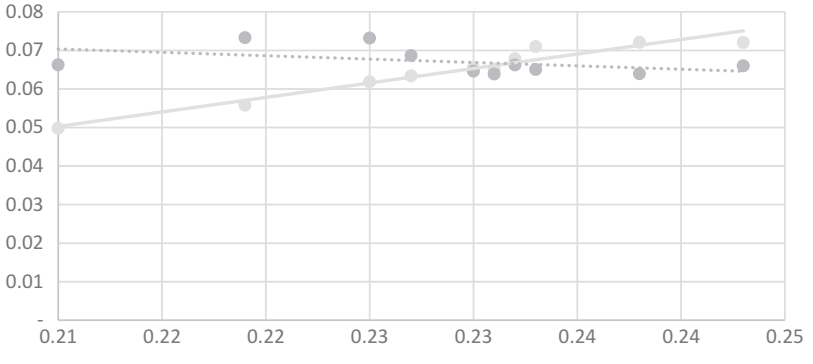

Figure 2. Scatterplot of the relation between proportion of tertiary graduates in total (*x*-axis) and proportion of tertiary graduates in low-wage jobs (*y*-axis), 2003–2012. Sorted by students (dotted trend line) and non-students (solid trend line). Correlation 0.86.

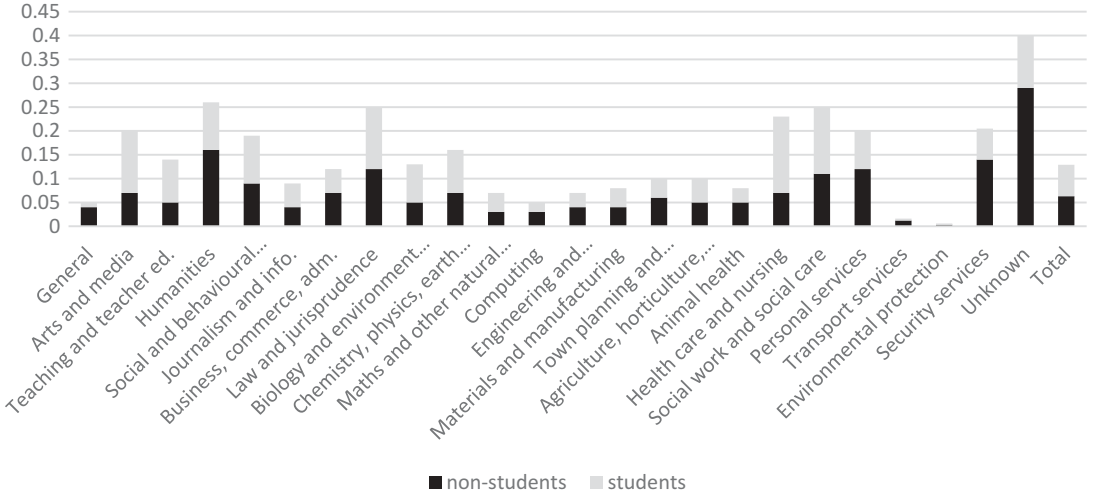

Figure 3. Proportion of tertiary graduates in low-wage jobs within each field of education, 2003–2012. Divided by 'students' and 'non-students'.

In sum, both field of education and study activity seems to explain over-education among tertiary graduates. However, higher education activities do not explain the increase in over-educated graduates. Neither can the general pass rate of graduates, nor study activities, explain mechanisms behind the clear association between the field of education and low-wage jobs. In the next section, I will examine the likelihood of over-education related both to the human capital variables outlined above and to personal attributes. To include personal attributes enables us to study how different groups in the labour market signal productivity, but this may also show if 'fields at risk' (as discussed above) are explained by personal attributes connected to the specific fields.

Attention is first paid to field of education (Table 2, empirical deviation). As we already know, graduates from 'fields of lower risk' were less likely to have a low-wage job, when compared to graduates from 'fields of higher risk' (especially graduates from humanities, law and social work, and unknown). The main argument for including field of education in the MCA (Table 2) is to determine if the effects remain after controlling for study activities and personal attributes. On the whole this seems to be the case, even if the effects decrease somewhat (pronounced for law studies), when we compare the multivariate effects (adjusted deviation) with the bivariate effects (empirical deviation). This indicates that none of the personal attributes included in the model were largely related to the fields of education.

Turning to graduates still in education, the analysis displays a difference of more than 20 percentages between those still in education, and not in education (Table 2, empirical deviation). These effects remain even after controlling for field of education and personal attributes.

Following the research of Rubb (2014) and Verhaest, Schatterman, and Van Trieer (2015), but in contrast to Swedish studies (Universitetskanslerämbetet 2013; Grannas and Oscarsson 2001), female graduates in this study were slightly more likely to have low-paid jobs than men, but the over-representation was rather small. The small effect indicates that female workers do not seem to signal much lower productivity than men in the Swedish labour market (Table 2, adjusted deviation).

The youngest age group was much more likely to be over-educated, when compared to older graduates, and this result is in line with earlier international studies (Groot and Maassen van Den Brink 1996; Rubb 2003). This is an expected outcome, since employment possibilities based on human capital not only refer to tertiary graduation but also to previously acquired skills, which at least statistically should grow with age.

When it comes to country of birth the result indicates, like many previous studies (Verhaest, Schatterman, and Van Trieer 2015; Rubb 2014; Böhlmark 2003; Battu and Sloane

Table 2. The likelihood of over-education among tertiary graduates, by human capital and individual determinants. Multiple classification analysis. Empirical (bivariate) and adjusted (multivariate) deviations from Grand mean. ETA and BETA in bolds.

		ETA Empirical deviation	BETA Adjusted deviation
Grand mean		.13	.13
Field of education		**.19**	**.15**
	Arts and media	.07	.07
	Humanities	.12	.10
	Social and behaviour science	.06	.05
	Law	.12	.06
	Healthcare	.10	.08
	Social work	.12	.11
	Personal services	.07	.07
	Security	.08	.04
	Unknown	.27	.18
	Fields of medium/lower risk	−.04	−.03
Still in studies		**.26**	**.20**
	No	−.05	−.04
	Yes	.16	.12
Sex		**.10**	**.06**
	Man	−.04	−.02
	Woman	.03	.02
Age		**.19**	**.13**
	−27	.10	.06
	28–31	−.03	−.02
	32–	−.05	−.04
Region of birth		**.13**	**.08**
	Sweden	−.01	−.01
	Nordic, EU15, North America	−.00	−.05
	Other Europe	.11	.05
	Asia	.12	.06
	Africa	.31	.24
	South America, Oceania. Soviet, unknown	.13	.08
Parental level of education		**.10**	**.07**
	Lower secondary	−.01	.00
	Upper secondary	−.01	−.00
	Post secondary <2 years	−.01	−.01
	Post secondary 2 years or more	−.01	−.01
	Unknown	.11	.07
	R2		.127
	N		4,441,218

2002; Grannas and Oscarsson 2001), that the likelihood of having a low-wage job largely varied with region of birth. People from Africa were much more likely to have a low-wage job than any other group. Reasons for the over-representation in low-wage jobs among people born overseas have been expressed in terms of either lack of social networks or pure labour market discrimination (Aldén and Hammarstedt 2014). Thus, ethnic minorities seem to signal low productivity, and this is stated in relation to their overall higher risk of over-education in their jobs, when compared to Swedes and other Nordics.

Finally, unlike previous research (Verhaest and Omey 2010), the model does not indicate a relationship between social background and over-education. The insignificant effect may derive from the selection of only tertiary graduates. It is likely that social origin is more important for the prediction of level of education, or even when predicting over-education among lower educated.

The detection of human capital variables and personal attributes as predictors of over-education raises the question if these are important also for the likelihood of leaving the status of over-education and finding better matched work? This will be discussed in the following section.

Mobility behaviour of the over-educated

In this section, I will focus on upward mobility among the over-educated. The selection group consists of everybody up to 35 years of age who graduated from tertiary education in 2003, and held a low-wage job in 2004. After these selections, 19,379 individuals remained. They were then followed from 2005 to the end of the study in 2012.

Overall, 83 per cent left the lowest job wage group at some point between 2005 and 2012, while 17 per cent remained in the lowest job wage group, at least until 2012. Among those who transferred from job wage group 1, around 60 per cent reached the two highest job wage groups (four or five). Fifteen per cent transferred to the second job wage group and 25 per cent to the third job wage group. Figure 4 illustrates the year when these transfers took place. The most common was to transfer to other job wage groups during the first or second year (2005 or 2006), while very few transferred to other job wage groups after 4 years (2008). Transfers that occurred after 4 years were primarily to the two highest job wage groups. However, it is not clear if workers who first transferred to the second or the third job wage group later on used these posts as a stepping stone into work that matched their educational attainment in the fourth or fifth job wage group.

In order to study whether variations in individual attributes have impact for upward mobility among the over-educated in 2004, I have used a Cox regression. This model identifies the extent to which the over-educated moved from the lowest job wage group to any other group during the study period 2005–2012. More precisely, the estimates represent the yearly average odds ratio of leaving the lowest job wage group. Data represent the entire population, and therefore the standard errors related to their B-coefficient are displayed instead of significance levels.

The regression in Table 3 shows that the odds ratio among graduated from 'fields at risk' was 20 per cent lower than for graduates from other fields. If we recall the results from the previous section, this means that first the field of education increased the risk of over-education, and then also decreased the chances of upward mobility. Turning to the variable 'still in education' the regression shows a positive effect. The yearly odds ratio is 22 per cent larger for students who transfer from low-wage jobs when compared to non-students. Therefore, as one can expect, study activities first increased the likelihood of over-education but in the long run this turned out to be positive for upward mobility. The job competition model suggests that when many jobseekers possess the same formal competence in the hiring process, potential employers look for attributes signalling productivity beyond formal qualifications. Study activities can be one such attribute. The hesitation was whether additional education would signal

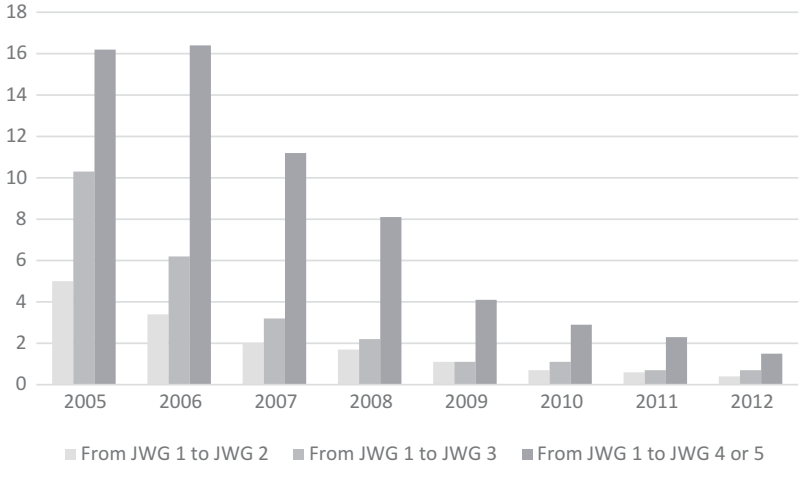

Figure 4. Yearly transfers (per cent) from job wage group 1 to job wage group 2, 3 or 4–5.

Table 3. Cox regression estimates on the hazard of tertiary graduated transferring from the lowest job wage group to any higher job wage group, 2005–2012. Sample size 19,384.

	Exp(B)	B	SE
Field of education (*ref non-risk fields*)			
Fields at risk	0.79	−.231	0.016
Still in studies 2004 (*ref not in studies*)	1.22	.201	0.017
Woman (*ref man*)	1.06	.062	0.018
Age *(cont)*	0.92	−.082	0.003
Region of birth (*ref Sweden*)			
Nordic EU15 North America	0.86	−.151	0.071
Other Europe	0.97	−.035	0.059
Asia	0.93	−.076	0.049
Africa	0.72	−.329	0.127
South America, Oceania, Soviet, unknown	0.82	−.195	0.093
Parental level of education (*ref lower secondary*)			
Upper secondary	1.03	.033	0.036
Post secondary <2 years	1.04	.036	0.039
Post secondary 2 years or more	1.02	.022	0.036
Unknown	0.91	−.092	0.055
Chi2	1656		
−2LL	300,685		
−2LL 0-model	302,341		

capacity or labour market establishment problems, because it is uncertain why they resumed education. Further education can complement previously attained studies, something that possibly signals greater capacity. However, if one chose further education rather than open unemployment, it can signal establishment problems. Here, it seems that further education signalled productivity, since the mobility chances were higher for this group.

Individual attributes had impact for mobility chances, but these were much less predictive than the human capital variables (Table 3). The likelihood of women being able to transfer from a low-wage job was slightly greater than for men (although women were more likely to be over-educated in the first place). This finding contradicts many previous studies where females were shown to be less likely to be able to be upwardly mobile (Rubb 2014; Verhaest, Schatterman, and Van Trieer 2015). The probability of over-education was largest for the youngest, but as shown in the regression (Table 3), younger age groups were positively correlated with upward mobility. For instance, for a 30-year old the odds ratio was annually around 50 per cent lower[2] than for a 20-year old. In agreement with previous research, some ethnic minorities were much more likely to be over-educated, and particular ethnic minorities were also much less likely than others to experience upward mobility. Finally, the parental level of education showed no impact for the likelihood of over-education, nor did it for the mobility behaviour of the over-educated.

Conclusion

Over-education and upward mobility

According to the Job competition model (Thurow 1976), highly educated without jobs usually look for jobs single steps down in the job queue. However, this study shows how increasing numbers of graduates between 2003 and 2012 took big leaps all the way down in the job queue to the unskilled jobs. In this context, it is important to note that the over-educated in this study were extremely over-educated. Nevertheless, there were also over-educated people in job wage groups two and three, but they were not the subject under consideration here.

One of the aims of this research has been to locate explanatory factors for over-education among graduates, and the initial assumptions were that such features should be sought for in the supply side of the labour market. The result shows that the general increase in graduates correlated

very well with the increase in over-educated graduates. Furthermore, this also shows that many graduates in low-wage jobs were students, something that explains over-education to a certain extent. However, even if it explains over-education it does not explain the increasing number of graduates in low-wage jobs. Finally, the results also indicate that graduates from some specific fields of education were particularly exposed to over-education, but with the data used in this study it was not possible to identify the mechanisms behind this.

To have low-wage jobs on a temporary basis while studying, or as a first job in ones working career, can appear uncomplicated. However, according to both previous research and the results in this study, over-education can be persistent over long periods of time. One reason for such persistence can derive from the characteristics of most low-wage jobs, where employers usually have few incentives to invest in the employees, and there are usually no opportunities for career progression. In this study, around 60 per cent of the over-educated transferred to completely different jobs that better matched their human capital. The rest, around 40 per cent either stayed in jobs related to the lowest wages in the labour market, or transferred to jobs in adjacent job wage groups, where many were still over-educated. The chance of upward mobility varied with the field of education, but also with after graduation. Graduates still in education had significantly better chances of upward mobility, and, as a result it seems that postgraduate education actually signals productivity, and that human capital investments besides the job itself can have positive effects for the chances for upward mobility.

Consequences of the contemporary weaker match between education and skilled jobs

As the results display, around 13 per cent of the graduates became extremely over-educated in their job positions. The extent to which extreme over-education is the best way to find a well-matched job over time is not yet established. The alternative could be to remain unemployed while searching for better matched work. However, the job positions among the initially unemployed were not investigated in this study, which so far precludes the ability to draw ambitious conclusions about the relative merits of extreme over-education.

Irrespective of the merits, over-education should also be discussed in relation to other potential consequences. First, for the individual, a deteriorating matching process may result in substandard utilisation of human capital, followed by the absence of upward mobility. Second, over-education among graduates can also have implications for the reduction in employment opportunities for the unskilled. If graduates lack opportunities to choose jobs at the level of their educational requirement, or the requirements next under their own, this increasingly seems to lead them to unskilled work, which in turn pushes aside the unskilled workers. When controlling my own data it showed that, to an increasing extent, when graduates (2003–2012) had low-wage jobs (JWG 1), the unskilled (lower secondary) were increasingly represented in the unemployment statistics (Appendix, Table A1), despite the growth of low-wage jobs in recent years. This observation also seems to be in line with the implication of the Job competition model, which suggests that the possibility for the unskilled at the back of the queue to find work is based on the total number of jobs, not the shortage of low-wage jobs in particular. Given such displacement mechanisms, it can be assumed that the association between education and jobs will weaken for all jobseekers, regardless their level of educational attainment.

Notes

1. To reach the level code according to SUN, each individual has accomplished the education with a 'pass'.
2. 1- Exp ((ln0,921) * 10)).

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No potential conflict of interest was reported by the author.

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Appendix

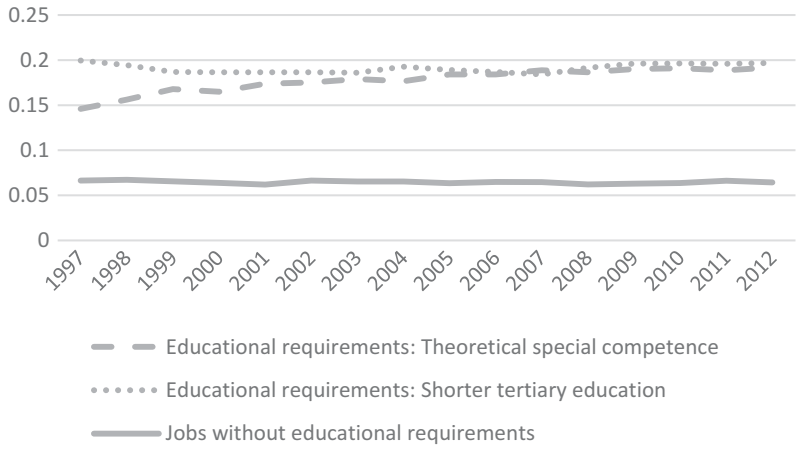

Figure A1. Share of jobs (of total number of jobs each year) requiring theoretical special education, shorter tertiary education and share of jobs without particular educational demands.

Table A1. Occurrence (%) and change in representation (percentage) in job wage groups among lower and higher educated (up to 35 years) between 2003 and 2012.

	Lower secondary level			Tertiary level		
	2003	2012	Diff	2003	2012	Diff
Q5	0.028	0.025	0.003	0.257	0.257	–
Q4	0.052	0.055	−0.003	0.206	0.210	−0.004
Q3	0.138	0.116	−0.022	0.177	0.143	−0.034
Q2	0.184	0.150	−0.034	0.095	0.113	0.018
Q1	0.236	0.210	−0.026	0.100	0.120	0.020
Unemployment	0.302	0.340	0.038	0.144	0.096	−0.048