

# Chapter 11

## Overeducation Among European University Graduates: A Constraint or a Choice?

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### 11.1 Introduction

The issue of educational and skills mismatch has received a vast amount of attention within the academic literature over recent years (see Quintini 2011; McGuinness 2006 for reviews). The bulk of the literature to date has focused on the issue of overeducation, which refers to the phenomenon whereby workers are employed in jobs for which they have more schooling than necessary, in terms of what is required to either get or do their current job. From a policy perspective, overeducation is considered important as it has potentially damaging impacts for individuals, firms and the economy. The research to date has consistently shown that overeducated workers earn substantially less than their counterparts with similar levels of schooling who are in matched employment (Allen and van der Velden 2001; Korpi and Tahlin 2009). Wage penalties for overeducation have been found consistently across many countries and for numerous time periods. Overeducation may also devalue the abilities or skills acquired in formal education, since workers are not able to develop them (or built upon them) during the period they are overeducated (De Grip et al. 2008). From the perspective of firms, there is ample evidence that overeducated workers have a much higher probability of job separation, suggesting that firms employing such workers will tend to incur in higher recruitment and training costs (McGuinness and Wooden 2009; McGuinness 2003). Furthermore, if overeducation imposes productivity constraints on workers, due to restrictive job conditions

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lowering their level of output, it will also impose limits on the level of national income achieved within countries. Although some excess of skills or competences in the workforce can constitute a margin for future work productivity improvements in the economy, it may also become a waste of resources that could be allocated more efficiently, either to other goals within the realm of education or elsewhere. It is thus important to distinguish to what extent overeducation is just a temporary phenomenon (or even an excess of skill supply that could eventually favour the worker or the firm she works for) or a more constraining phenomenon. This chapter tries to explore this distinction.

Despite the large number of studies indicating that overeducation may be costly on a number of fronts, there is not much evidence that the issue is viewed with a high level of concern by policymakers. The trend within developed economies has been one of the continued expansions at higher education, with little evidence of any concerted efforts among policymakers to tackle the issue of educational mismatch. The current thrust of policy may be explained by a reticence among politicians to initiate policies that question the continued expansion of higher education places or improve the employment prospects of graduates, but an alternative explanation may rest in competing theoretical arguments of overeducation. While some theories see overeducation as a constraint, others dismiss it as a mere reflection of strategic behaviour, preferences or unobserved heterogeneity. Thus, despite the evidence relating to lower earnings among overeducated workers, there is much debate on the extent to which the phenomenon is really damaging for workers. This perhaps goes some way towards explaining the degree of policy inertia surrounding the issue. Although a number of studies have attempted to assess the relative merits of competing theoretical explanations of overeducation by identifying the degree to consistency between observed relationships and model predictions (Hartog and Oosterbeek 1988; Alba-Ramirez 1993; Groot 1996; Kiker et al. 1997; Sloane et al. 1999; McGuinness and Pouliakas 2017), the situation remains unclear. This study departs from the previous literature by measuring the policy relevance of overeducation by the level of *dissatisfaction* it generates with regard to both graduates' choice of degree course and their current job. Finding of a consistent link between overeducation and high levels of dissatisfaction with both previous human capital investments and current labour market status will provide a strong indication of the constraining nature of overeducation.

The remaining chapter is structured as follows. First, we will present the theoretical arguments in favour of considering overeducation as constraining or not for workers. We will also discuss job dissatisfaction and satisfaction with university programmes as touchstones for the study of overeducation as a constraining phenomenon. We will then formulate the subsequent hypotheses and present the data and methods for testing them. After discussing the results, we will retake the theoretical debate, to assess the degree to which overeducation is actually a constraining phenomenon or not.

## 11.2 Overeducation: Theory and Evidence

Theoretical explanations of overeducation can be classified into those that view overeducation as a constraining factor relevant to policy and those that suggest the opposite.

### 11.2.1 *Overeducation as a Constraint Factor*

**Assignment Theory and the Job Competition Model** Both theories stress the importance of job characteristics as a determinant of earnings. Assignment theory (Sattinger 1993) predicts that wages will be partially determined by both job conditions and workers' education. Workers' overeducation is conditional on the sector, occupation or job type they initially chose. Although choice is a factor underlying assignment theory, it can be viewed as a constrained choice because a lack of suitable matches will result in a proportion of workers failing to get a job that matches their acquired levels of education.<sup>1</sup>

Within the job competition model, worker choice is more fully constrained as their ultimate status depends solely on the distribution of available jobs and the workers place in the queue. Under the assignment theory, mismatched workers may still be able to exert some influence on job conditions and earning; however, under the job competition model, productivity rests entirely within the job. An alternative argument that earnings will be wholly determined by job requirements, with the level of worker's human capital largely irrelevant, is commonly known as the job competition model (Thurow 1975).

Both the assignment theory and the job competition model suggest that job characteristics will not automatically adjust to accommodate workers' human capital and that overeducation will emerge and persist in situations where the levels of human capital held by employees are in excess to those required for their current job given its characteristics. Overeducated workers that according to job competition model are involved in a process of credential inflation, and overeducate themselves as a way of being better positioned in a job queue for available vacancies, may easily become dissatisfied with either the job they attain, their previous educational programme or both. Similarly, the assignment theory suggests that while overeducated workers may be able to alter the productivity requirements of their job to boost earnings to some extent, this adjustment process will never be perfect, resulting in a wage penalty. Thus, overeducation may certainly become constraining as a consequence of inflexible job conditions under both frameworks.

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<sup>1</sup>The framework also facilitates the situation whereby workers choose to be overeducated. However, a fundamental aspect of the model is that it does not assume a perfectly flexible labour market, thereby providing an explanation for the existence of overeducation in the context of imbalances between the supply and demand for educated labour.

### 11.2.2 *Theoretical Frameworks That Disregard Overeducation as a Constraint*

Overeducation may not be constraining if it does not reduce the value workers draw from both their human capital investment. This may happen if (a) their educational attainment conceals lower abilities or skills than the ones that would be required from a matched worker; (b) overeducation is a conscious strategy for further job promotion or improvement; or (c) the workers' main preferences are not related to job match, but to other utilities they draw from their jobs. The theoretical frameworks consistent with overeducation as a non-constraining factor are summarized below:

**Human Capital Theory** This framework assumes that labour markets are sufficiently flexible to allow workers to earn their marginal product (Becker 1964). As all workers earn a wage proportionate to their productivity, any pay gap resulting from overeducation simply reflects a productivity-related measure (that systematically varies with overeducation) that has not been appropriately captured in the data. Overeducation merely reflects that key aspects of human capital, such as innate ability and/or skills accrued through training, are not appropriately measured in studies with earnings and that such factors are likely to be correlated with overeducation (McGuinness and Pouliakas 2017).

The human capital approach to overeducation is thus relevant for the distinction between *overeducation* and *overskilling* often made by the literature. As mentioned above, overeducation is the situation whereby workers are employed in jobs for which they have more schooling than necessary, either in terms of getting or doing their job. Overskilling is the situation where their skills are *above* the skills actually required to optimally perform their jobs. This distinction implies that there may be situations where workers are formally overeducated but, since they lack skills that are necessary for doing their jobs, they are not actually *overskilled* (Green and McIntosh 2007; Quintini 2011). If overeducation does not actually correspond with overskilling (i.e. if it is just the result of a lack of skills relevant for worker's productivity), overeducation should not be a matter of policy concern either.

**Career Mobility** According to career mobility theory, workers may deliberately accept low-level jobs in order to acquire basic information, work-specific skills or experience related to their chosen profession (Rosen 1972; Sicherman and Galor 1990). Thus, following this theoretical explanation, overeducation is likely to be temporary in nature as such a strategy generally results in faster career progression.

**Signalling Theory** Under this framework, overeducation occurs because of asymmetric information and poor quality signals, i.e. the worker had inadequate information about the employer before accepting their current job and/or vice versa. This argument is consistent with the signalling (Spence 1973) and job search (Stigler 1962; McCall 1970) literatures in labour economics. Once the mistake is realized, the employment relationship will come to an end. Overeducated workers and their

employers will separate. The worker will then adopt search methods to ensure that subsequent jobs will not result in overeducation. Signalling theory implicitly entails that overeducation is necessarily short-lived.

**Compensating Wage Theory** This theory generally describes situations whereby workers accept higher wages as compensation for adverse job characteristics. Applied to job mismatch, this framework may explain that workers are willing to become mismatched and forgo earnings in return for certain positive job characteristics (McGuinness and Pouliakas 2017). People may choose jobs for which they are overeducated, accepting lower earnings as a result, if they are more than appropriately compensated by other aspects of the job such as intrinsic satisfaction, flexible working conditions, accessibility, etc. (McGuinness and Sloane 2011).

A number of studies have found evidence that the assignment framework describes the wage determination process more adequately than either human capital theory or the job competition model (Hartog and Oosterbeek 1988; Alba-Ramirez 1993; Groot 1996; Kiker et al. 1997; Sloane et al. 1999). The balance of evidence would tend to support the predictions of assignment theory over either the human capital model or the job competition model (McGuinness 2006). In a more recent study, McGuinness and Pouliakas (2017) used the European skills and jobs (ESJ) survey (whose data was published by CEDEFOP) to assess the overeducation wage penalty that could be attributed to the various theoretical explanations. McGuinness and Pouliakas (2017) reported that both the human capital and assignment/job competition frameworks were important contributing factors. They also found that asymmetry of information accounts for a significant part of the overeducation wage penalty for tertiary education but found little evidence to support theories of career mobility or compensating wage differentials.

In sum, while the academic literature tends to clearly show that overeducation has a negative impact on earnings, it is still unclear the extent to which the phenomenon actually constrains workers. In the current chapter, we want to further explore into this issue by using job dissatisfaction and satisfaction with previous education as tests for measuring the extent to which overeducation works as a constraint for workers. This is similar to the work Mavromaras et al. (2011) did for the Australian labour force. They combine overeducation and lack of job satisfaction as reflection of “involuntary under-utilization of skills”, which in turn is regarded as a sign of “lower productivity and a welfare loss” (p. 31). However, this chapter is the first study to relate overeducation specifically to job dissatisfaction and to examine the extent to which overeducated workers are more likely to regret their educational choices.

### 11.3 Job Satisfaction and Satisfaction with Education

Following Kucel and Vilalta-Bufí (2013), we consider overeducation as a constraint if it fits in Locke’s concept of job satisfaction. Locke’s idea of job satisfaction is related to (a) what workers perceive in their jobs, (b) what they expect from them and (c) what they assess as the *discrepancy* between the former and the latter (Kucel

and Vilalta-Buñ 2013). Such a discrepancy is a good measure of the extent to which overeducation becomes a constraint.

Yet, the extent to which university graduates feel overeducation as a constraint could be assessed either by resorting to job satisfaction or to the satisfaction they express towards the educational programme that eventually led them to get these jobs. Overeducation as a constraint should – in our view – be measured by looking at both sides of the transition from education to work. If university graduates were happy with jobs for which they are overeducated (because they draw other utilities that are more important for them than job match), they would not only feel relatively satisfied with their current jobs; they would also assess positively the education that allowed them to get these jobs.

The association between job satisfaction and either overeducation or overskilling has been explored more in depth. Most studies find a negative association between both phenomena, which is even stronger for overskilling than for overeducation (Allen and van der Velden 2001; McGuinness and Sloane 2011; Kucel and Vilalta-Buñ 2013). The difference is possibly due to the fact that some overeducation may not actually correspond with workers having skills well above what is required for the jobs they hold. Other studies only find a negative effect for satisfaction in the case of overskilling, and no effect for overeducation, once the educational mismatch only attributable to overskilling is controlled for (Green and Zhu 2010; Mavromaras et al. 2013, p. 386). Thus, using data from the Household, Income and Labour Dynamics in Australia (HILDA), Mavromaras et al. (2013, p. 386) find that “overeducation (...) is clearly not associated with lower levels of job satisfaction. Average job satisfaction (...) appears to be largely associated with the presence of overskilling rather than overeducation”.

The association between overeducation and satisfaction with previous education has not been as thoroughly studied as the association between overeducation and job satisfaction. In fact, there are very few studies dealing with it. Quite obviously, graduates’ satisfaction with education could be a function of many other things, among them, the satisfaction intrinsically provided by the training received, or the assessment of its quality, independent on how much such training prepared the graduate for getting his/her job, or performing the tasks contained in it. Yet, we believe that overeducation or overskilling, if perceived by graduates as something that is not being compensated by other types of utility graduates derive from their jobs, could also be a source of dissatisfaction. Graduates may put the blame, not just on employers or the labour market but on the ineffectiveness of their graduate training for positioning themselves well in the labour market or marking their profile attractive to employers.

Furthermore, the existing literature (Allen and van der Velden 2001; Sanchez-Sanchez and McGuinness 2015) focuses exclusively on the measure of job satisfaction, where the reference category will contain individuals who have neutral levels of job satisfaction *or are dissatisfied*. If we examine the distribution of the job satisfaction variable (Table 11.2), the majority of the reference category<sup>2</sup> will have neu-

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<sup>2</sup>This relates to the values 1, 2 and 3 with 3 denoting neutral job satisfaction.

tral levels of job satisfaction. Therefore, the measure used in the literature is not necessarily measuring the extent to which overeducation constrains workers' levels of job satisfaction. Here we focus on the link between overeducation and job dissatisfaction, which more accurately reflects the extent to which overeducated workers are more adversely affected in their current employment.

## 11.4 Data and Methods

The data for the study comes from the Flexible Professional in the Knowledge Society (REFLEX) and/or HEGESCO projects. The Flexible Professional in the Knowledge Society (REFLEX) project was financed as a specific targeted research project (STREP) of the European Union's Sixth Framework Programme covering 15 countries. It is limited to graduates in the 1999/2000 academic year, who were interviewed 5 years later in 2005. The HEGESCO survey collects the same information for an additional group of countries and consists of graduates received their awards in 2002/2003.

Measuring the impact of overeducation on job dissatisfaction or the regret of previous educational programme entails a clear risk that overeducation correlates with a series of adverse personal and job characteristics that will also simultaneously influence the outcome variable, making the identification of causal relationships difficult. For instance, overeducated workers may have lower levels of relative ability or they may be more concentrated in firm-size categories or sectors which, in turn, also correlate with educational regret. The presence of such non-random selection will generate biased estimates of the impact of treatment variables using a standard parametric estimation approach. Controlling such a possible selection bias connects with the idea that overeducation may be just a statistical artefact, as proposed by human capital theory (see above).

Given this, we estimate the impact of overeducation on educational regret by employing a propensity score matching (PSM) estimation framework (Rosenbaum and Rubin 1983), which explicitly controls the effects of sample selection. PSM is a two-stage estimation procedure. Stage 1 models the probability of being overeducated in current employment based on a range of observable characteristics including gender, migrant status, father's and mother's professional status, field of study, relative grade, hours worked, sector, firm size and country. Overeducated workers are then matched on the basis of their predicted probabilities, or propensity scores, with non-overeducated workers, and their rates of educational regret or job dissatisfaction are compared. More formally, the propensity score is defined as the conditional probability of receiving a treatment given certain determining characteristics:

$$p(X) = \Pr \left\{ D = \frac{1}{X} \right\} = E \left\{ \frac{D}{X} \right\} \quad (11.1)$$

where  $D$  is a binary term indicating exposure to the treatment, in this case overeducation, and  $X$  is a vector of determining characteristics. Rosenbaum and Ruben (1983) show that matching individuals on the basis of propensity scores is equivalent to matching on actual characteristics. In essence, the technique measures the difference in the rates of educational regret or job dissatisfaction between overeducated and matched workers with very similar observable characteristics,<sup>3</sup> thereby substantially reducing the impacts of selection bias such as those described above. To the extent that overeducation itself is correlated with observable characteristics that also determine educational regret or job dissatisfaction, such effects are removed from the data. The only observable characteristic distinguishing the control and treatment groups is the presence of overeducation, thereby allowing us to conclude more confidently that any substantial differences in the rates of educational mismatch between both groups are likely to be attributable to overeducation. In terms of the matching technique adopted, we apply nearest neighbour with replacement and common support.

The reliability of any propensity score matching estimate is dependent upon meeting the conditional independence assumption (CIA), i.e. that selection to the treatment is based solely on observables within the dataset and where all variables that simultaneously impact both the treatment and outcome variable are also observed. Given the rich nature of the data used and the range of controls used to describe overeducation, including measures of relative ability, educational provision and job characteristics, we can be relatively confident that the risk of bias derived from the omission of variables that simultaneously determine both overeducation and educational regret is likely to be limited.

Finally, as our estimated treatment effect is conditioned on the propensity score, we next check to ensure the assumption that matching on propensity scores is equivalent to conditioning on the individual characteristics was met by testing that all observable differences between the control and treatment groups have been eradicated post-matching. Our post-estimation check ensures that statistically significant differences within individual characteristics across the treated and untreated samples are eliminated post-matching. Before matching, differences are expected, but after matching, the covariates should be balanced in both groups, and hence no significant differences in covariate means should be found. This ensures that any additional conditioning on observable characteristics will not provide any new information on the treatment decision. Specifically, we measure the extent to which the pseudo  $R^2$  of the stage 1 probit falls towards zero when estimated on the matched sample, indicating that there remain no systematic differences in the distribution of the covariates between both groups (treatment and control).<sup>4</sup>

The three outcomes considered in our analysis are job dissatisfaction, regret (or lack of satisfaction with the educational programme taken at the university) and dissatisfaction with both. For job dissatisfaction, we took the first two scores in the

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<sup>3</sup> Matching on propensity scores has been shown to be generally equivalent to matching on observable characteristics (Rosenbaum and Rubin 1983).

<sup>4</sup> Results are available from the authors.



five-score scale generated from the following question in REFLEX/HEGESCO: “How satisfied are with your current job”; for dissatisfaction with education, we built a dummy variable considering those who rejected the possibility of studying the same study programme again; finally, we built another dummy variable for those who scored positively in the two previous ones.

The variables considered for estimating graduates’ propensity to overeducation in their current job (stage 1) are the following: gender, ethnic origin, father’s and mother’s professional status, years of higher education, average grade obtained at the end of the degree, field of studies, firm size, public or private sector, working in an innovative firm, number of employers in the graduate’s prior labour trajectory and labour market experience. We then estimate a second specification that contains a range of variables that reflect respondents’ motives for accepting their current job and the level of information they had about the job prior to accepting it. This approach allows us to assess the extent to which negative outcomes, on job satisfaction and university education, adjust when such preferences are controlled for. The respondents were asked separate questions to (a) rate the importance of various job characteristics to them personally and (b) the degree to which such job characteristics are present in their own job.<sup>5</sup> The following work dimensions were considered: work autonomy, job security, opportunity of learning new things, earnings, new challenges, career prospects, time for leisure activities, social status, the opportunity of doing something useful for society and the opportunity to reconcile work and family life. The dummy variables are based on the interaction of the two questions described above and indicate that the respondent highlighted that the job attribute was important to them “to a very high degree *and* that the attribute was present in their current job to “a very high degree”. The variables identify the individuals who declared a good match between their own preferences and the degree to which their jobs satisfied them *and* who stated a strong preference for any one of these work dimensions or values. Thus, in the case of job security, the dummy variable would identify graduates who valued job security highly *and* declared that they found this value well satisfied in their job.

By building these variables we expect to capture the degree to which overeducation is not a constraint, but the result of a trade-off with any one of these work dimensions. If compensating wage theory is confirmed, we would find first that, once these values are accounted for, our treatment (overeducation) does not have an impact on either job satisfaction or educational regret; second, we would find that strong (and satisfied) preferences for job security, conciliation of work and family life and other work dimensions (values) increase the likelihood of overeducation: graduates would accommodate or accept jobs for which they are overeducated in return of a satisfaction of any one of these values for which they declare a strong preference. Therefore, our empirical approach assesses the extent to which the impact of overeducation on job dissatisfaction and satisfaction with university education is reduced when preferences around the job that potentially compensate for

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<sup>5</sup>The rating scale for both questions ranged from 1 to 5 where 1 represented “not at all” and 5 “to a very high extent”.

some of the negative impacts of overeducation are collectively accounted for. The stage 1 models also measure the degree to which preferences around the presence of particular job attributes have an important influence on the probability of overeducation.

## 11.5 Results

Tables 11.1 and 11.2 show the distribution of two of the three dependent variables considered in our analysis. Regarding course regret with university programme, this was based in the respondent reporting that, on reflection, they would have studied a different programme. Just over a third of respondents expressed course regret with 18 per cent (12) indicating that they would study a different programme at another (the same) institution, while just 2% indicated that, on retrospect, they would decide not to study at all (Table 11.1). With respect to job satisfaction, assuming that values of 4 and 5 equate to being job satisfied, 3 neutrality and 1 and 2 to dissatisfied, approximately two thirds of employees were satisfied in their posts, and 22% were neither satisfied or dissatisfied with just 10% reporting dissatisfaction. On average, approximately 5% of employees in the data indicated that they were both dissatisfied in their employment and regretted their course of study, demonstrating that levels of combined disadvantage tended to be rare (Table 11.3). Figure 11.1 plots the relationships by country, and it is clear that job dissatisfaction tends generally to

**Table 11.1** Distribution of regret with university programme

Would you choose same study programme at same institute	Freq.	%	Cum.
No answer	880	3.63	3.63
1. Yes	14,067	57.96	61.59
2. No, a different study programme at the same uni	2893	11.92	73.51
3. No, the same study programme at a different uni	1682	6.93	80.44
4. No, a different study programme at a different uni	4289	17.67	98.11
5. No, I would decide not to study at all	459	1.89	100

*Note:* We take 2, 4 and 5 to create a binary variable

**Table 11.2** Satisfied with your current work

	Freq.	%	Cum.
No answer	156	0.64	0.64
1. Very dissatisfied	716	2.95	3.59
2. –	2004	8.26	11.85
3. –	5483	22.59	34.44
4. –	9950	41	75.44
5. Very satisfied	5961	24.56	100

*Note:* We take 1 and 2 to create a binary variable

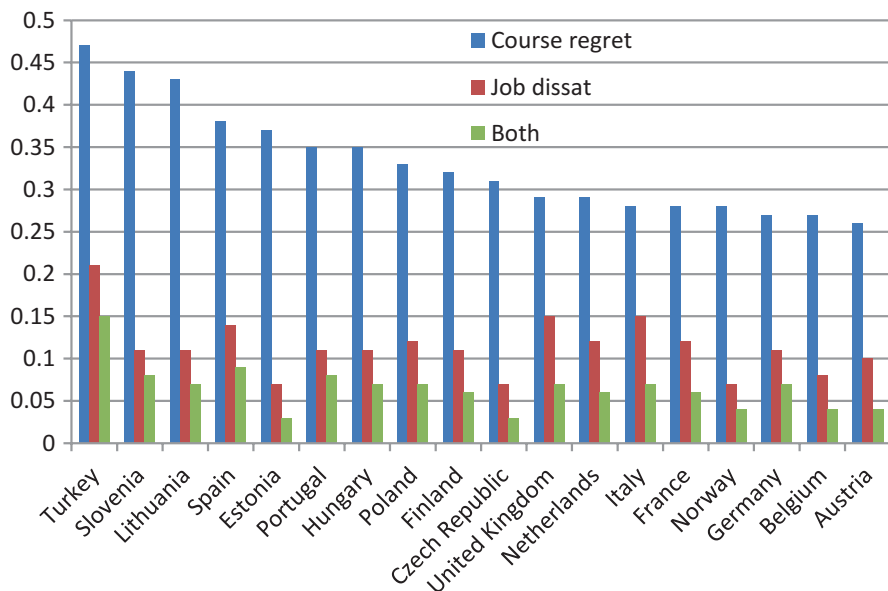


Fig. 11.1 Course regret, job dissatisfaction and both by country

be higher in countries with the greatest levels of course regret. The highest levels of disadvantage were found in Turkey, Slovenia and Lithuania and the lowest in Germany, Austria and Belgium.

Table 11.4 shows the estimates of the model aimed at generating the propensity scores of overeducation (propensity score model). Country dummies allow us to control for country-specific effects of the labour markets considered in the analysis. They also inform us that graduates’ overeducation is more salient a phenomenon in some labour markets (i.e. Spain, Italy, UK, Hungary or Austria). Controlling for these country-specific effects, there are a number of factors that reduce the risk of overeducation among graduates: labour market experience, academic performance at university (grades), working in firms with high level of research and development (*rdfirm*) or working in the public sector. Some field of studies (i.e. engineering, science or health) also reduce the risk of overeducation. Quite interestingly, the professional status of the father also reduces the risk of overeducation, which confirms the effect of social origin on overeducation, above and beyond its indirect effect through choice of field of studies (Capsada-Munsech 2015). Opposite to that, we see that overeducation is more frequent among overeducates with permanent contracts (see Table 11.5), prior unemployment spells or who have experienced higher job rotation (high number of employers in the previous labour market trajectory). Gender and ethnic origin do not seem to have a statistically significant effect on the likelihood of overeducation.

**Table 11.3** Distribution of the dependent variables by country

	Course regret	Job dissatisfaction	Both
Italy	0.28	0.15	0.07
Spain	0.38	0.14	0.09
France	0.28	0.12	0.06
Austria	0.26	0.10	0.04
Germany	0.27	0.11	0.07
Netherlands	0.29	0.12	0.06
United Kingdom	0.29	0.15	0.07
Finland	0.32	0.11	0.06
Norway	0.28	0.07	0.04
Czech Republic	0.31	0.07	0.03
Portugal	0.35	0.11	0.08
Belgium	0.27	0.08	0.04
Estonia	0.37	0.07	0.03
Slovenia	0.44	0.11	0.08
Turkey	0.47	0.21	0.15
Lithuania	0.43	0.11	0.07
Poland	0.33	0.12	0.07
Hungary	0.35	0.11	0.07

Table 11.5 adds graduates' preferences to the previous model. In this table we mostly find that graduates with a strong preference for any of the work dimensions considered in our analysis, and who find such preferences satisfied in their current jobs, do not work in jobs for which they are overeducated. For example, graduates who declare a strong preference for new challenges, learning new things or doing something useful for society, and who declare this preference satisfied in their current jobs are *less* likely to be overeducated, not more. In sum, jobs that allow this type of fulfilment for graduates are usually jobs *for* graduates. We may also say that it is unusual for graduates to *trade off* the fulfilment of these values *in return of occupying jobs for which they are overeducated*. Jobs for graduates are jobs that are *intrinsically* challenging or that give learning opportunities to the workers that occupy them. Some other preferences do not seem to be either positively or negatively associated to overeducation, even if such a trade-off could be more easily conceived or imagined. This is the case of leisure activities or conciliation of work and family life. Only in the case of job security and, to a lesser extent, time for leisure activities, we find a confirmation of compensating wage theory. Overeducated graduates seem to be more likely to value (and be) in jobs with higher levels of job security. Among the different values and preferences considered, it is job security and leisure activities that seem to be more likely to be *traded* with overeducation.

For each one of the countries considered in the analysis, Table 11.6 provides accurate estimates of the impact of overeducation on graduates' job dissatisfaction, regret with their educational programme and on the possibility that they state a lack of satisfaction with both their jobs and the educational programme they took at university. In most cases, we see that overeducation has a real and negative impact on job satisfaction and satisfaction with education. In other words, such a negative

**Table 11.4** Overeducation model from stage 1 PSM

Overeducation	Coef.	Std. err.	z	P > z
Hegescocoy <sup>a</sup>	0.09	0.37	0.26	0.80
Male	-0.10	0.07	-1.37	0.17
<i>Average grade</i>	-0.32	0.05	-7.04	0.00
<i>Years higher educ</i>	-0.36	0.05	-7.88	0.00
<i>FoS: (ref general, educ/ humanities)</i>				
<i>FoS: social sciences</i>	-0.28	0.09	-3.2	0.00
<i>FoS: science</i>	-0.49	0.12	-3.93	0.00
<i>FoS: engineering</i>	-0.73	0.12	-6.11	0.00
FoS: agric/veterinary	-0.11	0.19	-0.6	0.55
<i>FoS: health</i>	-0.99	0.14	-7.23	0.00
FoS: services	0.28	0.17	1.67	0.10
<i>Prior unemployment</i>	0.04	0.00	8.51	0.00
Migrant	-0.28	0.22	-1.27	0.21
Hours worked	0.00	0.00	0	1.00
<i>Public sector</i>	-0.86	0.08	-10.91	0.00
<i>High R + D firm</i>	-0.39	0.07	-5.7	0.00
Firm size 50-99	-0.23	0.12	-1.84	0.07
Firm size 100-249	-0.14	0.11	-1.25	0.21
Firm size 250-999	0.03	0.10	0.34	0.73
Firm size 1000+	0.02	0.08	0.2	0.84
<i>Labour experience</i>	-0.01	0.00	-4.53	0.00
<i>Num. of employers</i>	0.05	0.01	4.29	0.00
<i>Supervisory role</i>	-0.70	0.08	-8.95	0.00
Indefinite contract	0.05	0.07	0.75	0.45
Mother professional	-0.11	0.11	-1.01	0.31
Father professional	-0.28	0.10	-2.87	0.00
<i>Ref: Czech Republic</i>				
<i>Spain</i>	1.10	0.15	7.21	0.00
<i>Netherlands</i>	0.47	0.17	2.71	0.01
Norway	-0.05	0.23	-0.21	0.84
<i>Germany</i>	0.75	0.22	3.34	0.00
<i>Slovenia</i>	0.96	0.37	2.62	0.01
<i>Italy</i>	1.40	0.17	8.25	0.00
<i>Finland</i>	0.45	0.19	2.43	0.02
<i>UK</i>	0.97	0.18	5.32	0.00
Turkey	0.44	0.38	1.18	0.24
France	-0.19	0.25	-0.78	0.44
<i>Belgium</i>	-0.49	0.28	-1.72	0.09
<i>Hungary</i>	1.35	0.37	3.67	0.00
<i>Austria</i>	1.36	0.20	6.95	0.00
Lithuania	0.64	0.41	1.56	0.12
Estonia	-0.34	0.48	-0.7	0.48
Portugal	0.08	0.32	0.26	0.80
Constant	0.86	0.34	2.51	0.01

<sup>a</sup>This is a dummy variable identifying the additional countries added in the second wave of the data

**Table 11.5** Overeducation model from stage 1 PSM with preferences

Overeducation	Coef.	Std. err.	z	P > z
Hegescoyr <sup>a</sup>	0.08	0.36	0.24	0.80
Male	-0.12	0.07	-1.67	0.09
<i>Average grade</i>	-0.30	0.04	-6.55	0.00
<i>Years higher education</i>	-0.35	0.04	-7.67	0.00
<i>FoS: (ref general, educ/humanities)</i>				
<i>FoS: social sciences</i>	-0.30	0.09	-3.44	0.00
<i>FoS: science</i>	-0.49	0.12	-3.96	0.00
<i>FoS: engineering</i>	-0.76	0.12	-6.35	0.00
FoS: agric/veterinary	-0.17	0.18	-0.91	0.36
<i>FoS: health</i>	-0.97	0.13	-7.02	0.00
FoS: services	0.28	0.17	1.69	0.09
<i>Prior unemployment</i>	0.03	0.00	8.18	0.00
Migrant	-0.22	0.22	-1	0.31
Hours worked	0.00	0.00	0	1
<i>Public sector</i>	-0.83	0.08	-10.41	0.00
<i>High R + D firm</i>	-0.31	0.07	-4.46	0.00
<i>Firm size 50–99</i>	-0.24	0.12	-2	0.04
Firm size 100–249	-0.19	0.11	-1.68	0.09
Firm size 250–999	0.02	0.10	0.2	0.84
Firm size 1000+	-0.00	0.08	-0.1	0.92
<i>Labour experience</i>	-0.01	0.00	-5.01	0.00
<i>Num. of employers</i>	0.05	0.01	4.56	0.00
<i>Supervisory role</i>	-0.65	0.07	-8.25	0.00
Indefinite contract	-0.26	0.13	-2.02	0.04
Mother professional	-0.09	0.10	-0.88	0.37
Father professional	-0.28	0.09	-2.84	0.00
<i>Autonomy</i>	-0.37	0.09	-3.89	0.00
<i>Job security</i>	0.64	0.14	4.48	0.00
<i>Learning new things</i>	-0.68	0.11	-5.97	0.00
Earnings	0.01	0.20	0.05	0.95
<i>Challenges</i>	-0.30	0.14	-2.11	0.03
Career prospects	0.01	0.15	0.11	0.91
<i>Time for leisure</i>	0.26	0.10	2.42	0.01
<i>Social status</i>	-0.55	0.22	-2.52	0.01
<i>Useful for society</i>	-0.37	0.12	-2.92	0.00
Conciliation work family	0.11	0.11	1.02	0.30
<i>Ref: Czech Republic</i>				
<i>Spain</i>	1.04	0.15	6.81	0.00
<i>Netherlands</i>	0.42	0.17	2.42	0.01
Norway	-0.09	0.23	-0.38	0.70
<i>Germany</i>	0.77	0.22	3.41	0.00
<i>Slovenia</i>	0.88	0.36	2.4	0.01

(continued)

**Table 11.5** (continued)

Overeducation	Coef.	Std. err.	z	P > z
<i>Italy</i>	1.38	0.17	8.07	0.00
Finland	0.35	0.18	1.89	0.05
<i>UK</i>	0.93	0.18	5.02	0.00
Turkey	0.42	0.37	1.12	0.26
France	-0.23	0.24	-0.93	0.35
Belgium	-0.52	0.28	-1.84	0.06
<i>Hungary</i>	1.29	0.36	3.5	0.00
<i>Austria</i>	1.48	0.19	7.48	0.00
Lithuania	0.69	0.40	1.7	0.08
Estonia	-0.34	0.47	-0.73	0.46
Portugal	0.08	0.32	0.26	0.79
Constant	1.00	0.35	2.86	0.00

<sup>a</sup>This is a dummy variable identifying the additional countries added in the second wave of the data

impact cannot be attributed to any of the observable characteristics of graduates that also determine educational regret or job dissatisfaction. It cannot be attributed to a presumable lower level of ability among those who are overeducated either (i.e. to the possibility that overeducation conceals an adequate level of skills), because the propensity scores have been generated also accounting for the level of skills of individuals in our sample. This comes as a further confirmation that not just overskilling but overeducation per se has a negative effect on workers' satisfaction.

Table 11.6 also shows that the effect of overeducation on job dissatisfaction or satisfaction with prior education does not disappear if the likelihood of becoming overeducated is estimated considering also graduates' values or preferences. Overeducation is a constraining effect in most countries, and there is hardly any country where, after considering the possibility that overeducation is explained by graduates' preferences different from job match, this constraining effect disappears.

## 11.6 Conclusions

Overeducated graduates' job satisfaction, or their satisfaction with the training previously received, could be affected by factors that are behind their educational mismatch. We should not assume that overeducated graduates are representatives of the whole population of university graduates. Therefore, if we want to have an accurate view of the effect of overeducation upon job satisfaction or satisfaction with education, we need to control this potential selection bias. We did so by applying propensity score matching to REFLEX/HEGESCO data on graduates who were interviewed in 2005. By estimating scores of graduates' propensity to become overeducated and

**Table 11.6** PSM estimates with preferences

	Course regret		Job dissatisfaction		Both	
	Without preference	With preferences	Without preferences	With preferences	Without preference	With preferences
All countries	0.207***	0.184***	0.263***	0.247***	0.191***	0.174***
Spain	0.1654***	0.184***	0.310***	0.292***	0.207***	0.204***
Netherlands	0.15***	0.224***	0.212***	0.204***	0.146***	0.129***
Norway	0.2258*	0.225*	0.103	0.207**	0.137**	-0.034
Germany	0.303***	0.272**	0.110**	0.294***	0.181	0.181
Slovenia	0.237***	0.325***	0.185***	0.259***	0.237***	0.212***
Finland	0.298***	0.283***	0.169***	0.155**	0.149***	0.149***
Italy	0.194***	0.213***	0.201***	0.192***	0.196***	0.176***
UK	0.228***	0.307***	0.345***	0.336***	0.150***	0.212***
Turkey	0.071	0.071	0.483***	0.516***	0.428***	0.339***
France	0.5***	0.231***	0.259*	0.185	0.307***	0.34***
Belgium	0	0.176	0.412***	0.353***	0.118	0.059
Hungary	0.0	0.014	0.340***	0.250***	0.148**	0.162***
Austria	0.232**	0.214**	0.210***	0.245***	0.107	0.125*
Lithuania	0.0	0.208	0.32***	0.48***	-0.208**	0.167
Czech	0.098	0.084	0.208***	0.138**	0.141***	0.070

\* $P \leq 0.05$  \*\*  $P \leq 0.01$  \*\*\*  $P \leq 0.001$

matching graduates according to these propensity scores, we get an accurate assessment of the effect of overeducation over job satisfaction or satisfaction with education.

Relative to prior analyses of the association between overeducation and job satisfaction, our analysis does not put dissatisfaction and neutral levels of job satisfaction together; on the contrary, it strictly explores the effect of overeducation on job *dissatisfaction*. By doing so, it more accurately assesses the effect of overeducation on job dissatisfaction. Our results point to a real and negative impact of overeducation on either job dissatisfaction, satisfaction with prior educational programme or both. Such an effect cannot be attributed to any of the observable characteristics of graduates that also determine job dissatisfaction or course regret.

As regards the possibility that overeducation is the result of a trade-off between job match and the satisfaction of other preferences university graduates may have on their jobs, opposite to what compensating wage theory predicts, we find that overeducation is mostly and negatively related with most of these preferences (work autonomy, opportunity of learning new things, earnings, career prospects, etc.). Graduates' jobs tend to be jobs where these preferences may be fulfilled, and the opposite happens with jobs where graduates' are overeducated. Only in the case of job security, we find some evidence supporting compensating wage theory. There is some sign that job match could be traded off for security in employment. It would be interesting to reflect upon the reasons why this preference may conform to compensating wage theory and the others not.



In sum, our findings reveal that graduates' overeducation is a truly constraining phenomenon. It implies a deficit in the return of graduates' human capital investment that cannot be explained either by a deficit in their actual skills or by the fact that they prioritize other job dimensions different from job match. Looking at the *net* impact of overeducation on job dissatisfaction or lack of satisfaction with prior education may be a way of identifying the countries, sectors or occupations where overeducation deserves fully attention of the policymakers.

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