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IZA DP No. 16913

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ABSTRACT

Overeducation, Overskilling and Job Satisfaction in Europe: The Moderating Role of Employment Contracts*

This paper is the first to examine whether and how overeducation and overskilling, considered separately and in interaction, influence workers' job satisfaction at European level. It also investigates the moderating role of employment contracts. Our results, based on a unique pan-European database covering 28 countries in 2014, show that overeducation and overskilling reduce the probability of workers being satisfied with their jobs, but also that the drop in job satisfaction is almost double for genuinely overeducated workers (i.e. workers that are both overeducated and overskilled). These adverse effects on job satisfaction are found to be more pronounced among mismatched workers (whether overeducated, overskilled or both) on fixed-term rather than indefinite contracts.

JEL Classification: C21, J24, J28, J41

Keywords: job satisfaction, overeducation, overskilling, labour contracts, Europe

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1. Introduction

It has been widely documented that workers' level of education has substantially risen over the last decades. For instance, the number of workers, aged between 20 and 64, having attained a tertiary level of education in the EU27 countries increased from 28.1% in 2009 to 38.8% in 2023 (Eurostat, 2023a). Furthermore, one of the European Union's objectives is to reach a proportion of 45% of tertiary educated people aged between 25 and 34 by 2030 (Council of the European Union, 2021). If this increasing level of education does not match jobs requirements, overeducation (Freeman, 1976) may appear. This phenomenon represents the inadequacy between a worker's attained level of education and the level of education required for her job: a worker is considered as overeducated if her attained level of education is higher than the level of education required for her job. Over-education is a significant and growing phenomenon, affecting 20.3% and 22.2% of workers in the EU27 countries in 2009 and 2022 respectively (Eurostat, 2023b). However, there is some heterogeneity in incidence and trends between European countries (McGuinness *et al.*, 2018)

Overeducation therefore appears to be an important issue whose effects need to be investigated (Mavromaras *et al.*, 2010). From a worker's point of view, it is particularly interesting to analyse its impact on job satisfaction, as most of the researchers agree that job satisfaction represents a measure of utility at work and well-being (Clark, 1996). It is often correlated with the way workers behave in relation to their work (Brief, 1998), with an evaluative judgment they make about an attitudinal object such as a person or an event (Weiss, 2002). Job satisfaction is also interpreted as feelings or affective responses to different facets of the job (Smith *et al.*, 1969). These feelings can further result from the comparison between the desired and the actual outcomes associated with these facets (Cranny *et al.*, 1992). In addition, many studies consider Herzberg's theory (1959) to study the determinants of job

satisfaction in different occupations and various contexts (Thant and Chang, 2021). According to Herzberg *et al.* (1959), the determinants of job satisfaction depend on *"different sets of work-related conditions and are therefore influenced by different factors"*. Herzberg's theory points towards two main factors explaining job satisfaction, i.e. hygiene and motivation. Fulfilling workers' hygiene needs through hygiene factors such as salaries or working conditions reduces or eliminates dissatisfaction, while meeting motivational needs can improve job satisfaction as such (Herzberg *et al.* 1959). Motivation or satisfaction factors refer, for example, to achievement, responsibility or advancement.

The theoretical literature studying the impact of overeducation on job satisfaction generally suggests that overeducation should lead to lower levels of satisfaction (Tsang, 1987; Hersch, 1991; Razeena and Wilson, 2015; Voces and Cainzos, 2021). However, the empirical evidence does not always confirm this prediction. This may be because, in some cases, overeducation may actually improve job satisfaction, for example if this specific situation is chosen by the worker in order to achieve a better work-life balance. (Chevalier, 2003; Verhaest and Omey, 2009).

This contribution aims to shed additional light on the relationship between overeducation and job satisfaction. Mavromaras *et al.* (2010) and Quintini (2011) question whether education is an accurate proxy of the worker's real capabilities on the job. More precisely, they suggest that education and overeducation may not properly reflect workers' actual skills at work. Consequently, any current evidence of the effects of these variables on workers' job satisfaction considered in isolation, without reference to other indicators of competence, may be unsatisfactory and potentially misleading in terms of workers' actual feelings about their own situation. Indeed, there may well be overeducated workers who possess the level of skills required to do their job, meaning that overeducation does not necessarily

imply overskilling (Pecoraro, 2014). In this respect, Chuang and Liang (2022) indicate that overeducation could be considered as a substitute for the lack of skills acquired through work experience. Besides, there might be workers who have the required level of education but who are considered as overskilled because they possess other (informal) skills beyond those required by their job. In short, workers with a given level of education may be heterogeneous in their levels of skills (Chevalier, 2003). Formal education therefore appears as an incomplete measure of actual skills, and workers may feel differently satisfied not only because of it, but also due to their levels of informal skills acquired through experience, on-the-job-training, or even thanks to their innate abilities (Chevalier, 2003; Verhaest and Omey, 2009). For this reason, when studying job satisfaction, it is more relevant to take into account both formal education and informal skills, which may interact with each other.

The main originality of this paper lies precisely in the fact that we are, to our knowledge, among the very first to investigate the relationship between job satisfaction and overeducation in interaction with overskilling, from the perspective of European workers. To do so, we rely on a unique pan-European database covering 28 countries in 2014, namely Cedefop's European Skills and Jobs Survey (ESJS). Current evidence of a link between overeducation, overskilling and job satisfaction is indeed fairly rare, with the two mismatches being mostly studied separately (Green and Zhu, 2010) or analysed as such, without reference to job satisfaction (Verhaest et al. 2018).

Furthermore, as far as we know, this paper is the first to investigate whether firms' hiring policies in terms of labour contracts affect these relationships. The effects of overeducation and overskilling on job satisfaction are likely to depend on whether workers are employed under fixed-term contracts (FTCs) or indefinite-term contracts (ITCs), particularly from a corporate social responsibility (CSR) perspective. CSR aims to balance benefits between organizations,

stakeholders and workers to improve firm performance and working conditions. In this context, employment contracts could be significant moderating variables insofar as they reflect the priority given by management to the well-being of the employees and, consequently, to the social climate in the company. More specifically, Peiro *et al.* (2010) suggest that permanent contracts can be seen as valuable rewards in the labour market, which may also act as a buffer to mitigate the negative impact of overeducation on job satisfaction.

The remainder of this paper is organized as follows. Section 2 explores the existing literature on the relationship between education, overeducation, overskilling, and job satisfaction, including the role that labour contracts can play. We specify our methodology in Section 3 and describe our dataset in Section 4. Section 5 presents our results and Section 6 concludes with a discussion.

2. Theoretical and empirical background

2.1. Education, overeducation and job satisfaction

Existing studies on the effect of education on workers' job satisfaction go in different directions. A first set of studies suggests that higher levels of education are associated with higher levels of satisfaction through higher levels of autonomy, promotion expectations, prestige, better working conditions, and the opportunity to develop other skills (Idson, 1990).

However, other studies suggest that higher education has a negative impact on job satisfaction due to workers' expectations (Clark, 1996; Brown and McIntosh, 1998; Gazioglu and Tansel, 2006). Locke (1976) finds that, even though higher-educated workers earn more, are promoted more quickly and end up with better jobs, the percentage of those claiming to be very satisfied is inferior to that of workers with lower levels of education. The author explains this negative relationship between education and job satisfaction by the fact that workers

compare their job expectations with actual job characteristics. It is likely that there is a positive correlation between educational attainment and workers' expectations of job quality, as higher educational attainment increases workers' expectations as such. Accordingly, for more highly educated workers, the expected higher quality of the job may well outweigh the actual higher quality of the job. More highly educated workers may thus report relatively lower job satisfaction than their less highly educated colleagues.

Theoretical investigations into the impact of overeducation on job satisfaction also point in different directions (Büchel, 2002; Hersch, 1991; Tsang, 1987; Tsang et al. 1991; Verhaest and Omey, 2006, 2009), and related empirical studies do not all reach the same conclusion, although they generally find a negative impact. On the one hand, several contributions suggest a negative effect of overeducation on diverse job satisfaction dimensions (Tsang, 1987; Hersch, 1991; Hartog, 2000; Battu *et al*. 2000; Green and Tsitsianis, 2005; Miller, 2007; Peiro *et al*., 2010; Zakariya and Battu, 2013; Piper, 2015; Razeena and Wilson, 2015 ; Verhaest and Verhofstadt, 2016; Wen and Maani, 2019; Sellami *et al*., 2020). An explanation for this negative effect could be that working in a job requiring a lower level of education than the worker's actual level limits the use of skills, which in turn reduces job satisfaction (Razeena and Wilson, 2015; Cim et al., 2017). It is also a source of inefficiency in the labour market and therefore has harmful effects on individuals, firms and the country as a whole. (Shahidan et al., 2019). Overeducation could also lead to an inconsistency between two dimensions of the worker's status associated with her investment in the level of education achieved and her reward at work, further leading to frustration and job dissatisfaction (Voces and Cainzos, 2021).

Moreover, Verhaest and Omey (2006) find that overeducated workers have a higher turnover, but the authors cannot validate the hypothetic impact of overeducation on job satisfaction. Nevertheless, using the same (but extended) dataset on Flanders, they find a

significant negative impact of overeducation on job satisfaction, but also that the negative consequence of overeducation on job satisfaction decreases with years of tenure. They find that overeducated workers are worse off than their adequately educated peers, suggesting that, at least at labour market entry, overeducation is largely involuntary (Verhaest and Omey, 2009). Voces and Cainzos (2021) also estimate a significant negative impact of overeducation on work satisfaction as considered with respect to both the work being done and/or feelings of personal fulfillment from one's work.

However, overeducation is not always found to lower job satisfaction (Mavromaras *et al*., 2010; Chevalier, 2003; Verhaest and Omey, 2009; Naguib et al., 2019). Overeducated workers can deliberately choose to be in such situation. As stated by De Jonge (1998), these workers can also privilege compensating characteristics associated with their jobs, such as higher job security, better work-life balance, or benefits that enhance job satisfaction. Sam (2020), referring to the career mobility theory (Sicherman and Galor, 1990), suggests that choosing a job requiring a lower level of education may also favour job satisfaction by enabling workers to acquire specific job-related skills in order to obtain better career advancement in the future. Moreover, accepting jobs for which they are overeducated may also allow them to cope with less job pressure (McGuinness and Sloane, 2011).

2.2. The overeducation-overskilling nexus

Various theoretical studies address the relationship between overeducation and overskilling (Cultrera *et al.*, 2022). For instance, it is argued that workers may decide to improve their level of schooling in order to compensate for a lack in some human capital characteristic such as ability or experience (Sicherman, 1991). Overeducation may then be the result of self-selection based on the heterogenous abilities of individual workers (Chuang and Liang, 2022).

Overeducation may also appear in situations where formal overeducation is accompanied by under-utilisation of skills in the workplace (Voces and Cainzos, 2021).

Esposito and Scicchitano (2023) investigate the role of personality traits on skill and educational mismatch in Italy. They notably find a positive effect of conscientiousness on both overeducation and overskilling. In other words, an apparent relationship between overskilling and overeducation may also derive from personality traits.

Next, the human capital theory suggests that overeducation and overskilling should only arise in the short run because of imperfect information. In the longer run, adjustments should be made either by the employer in order to use the full available skills or by the worker seeking a better match (OECD, 2011). Related to this, Mc Guinness et al. (2018) find overeducation rates to be persistent or decreasing over time in approximately 50% of the 28 EU countries (including the UK).

On the other hand, one could also figure out that overeducation *per se* might remain in the long run from a workers' point of view. Chuang and Liang (2022) refer to the job search model, in which people decide to accept a job when the wages offered are higher than or equal to their reservation wages. Thus, if people set their reservation wages according to their skills, equally educated but less skilled people will set lower reservation wages and accept lower-paid jobs for which they will be over-educated. As a result, these overeducated workers will tend to remain overeducated but not overskilled.

However, some arguments suggest that overskilling might also persist in the long run. Baley *et al.* (2022) for instance refer to the business cycle properties of mismatch that result from a complex interaction between job mobility and skills mismatch. They suggest that, while transitions within a career path to jobs that employ similar skills should reduce mismatch,

transitions into new career paths (to jobs that employ previously untried skills) tend to increase mismatch because of increased uncertainty.

Quintini (2011) also refers to other theories based on human capital suggesting that both overeducation and overskilling may subsist in the longer run. For instance, firms that are constantly facing changes in their technology may find it appropriate to hire workers with higher levels of education in order to accompany these changes at no additional costs, resulting in overeducation. They may also favour overskilling in their hiring practices in order to ensure quick reactions in changing and uncertain environments.

Another explanation may be that workers are inefficient in their job search: candidates with incomplete information may apply for and accept jobs with tasks that do not match their levels of education and/or skills, for which they are overeducated and/or overskilled.

2.3. Overeducation, overskilling and job satisfaction

While the nexus between overeducation and overskilling has been rather well documented, empirical evidence regarding the effects of these two variables (whether studied in interaction or not) on job satisfaction is scarce in the literature. While Johnson and Johnson (2000), Green and Zhu (2010) and Shevchuk *et al.* (2019) estimate a negative impact of overskilling, considered *alone* on job satisfaction, Mavromaras *et al*. (2011) García-Mainar and Montuenga-Gómez (2020) find that job satisfaction is reduced in cases of overskilling and overeducation, both when these variables are considered separately and in interaction. Different impacts are also found according to education pathway, gender and age (Mavromaras *et al*. 2013). Allen and van der Velden (2001) suggest that overskilling exerts a stronger negative impact on job satisfaction than overeducation, even after controlling for a wide range of job characteristics. Similarly, McGuinness and Byrne (2015) estimate that being overeducated reduces the

probability of being satisfied at work by nearly 20%, with even greater effects for overskilling (of almost 30%). Regarding the role of gender and migration, the authors find that migrant women domiciled in the host country at age 16 or older have a greater likelihood of being of overskilled and a lower probability of being satisfied with their jobs compared to native women. Finally, results of both Sanchez-Sanchez and McGuinness (2015) and Chuang and Liang (2022) also suggest that being overskilled is more detrimental to job satisfaction than overeducation.

2.4. The role of labour contracts

Over the last twenty years, fixed-term contracts (FTCs) have accounted for a relatively large and stable proportion of salaried employment in the EU27. More precisely, this share was around 14% in both 2003 and 2022 (Eurostat, 2023). Current findings about the influence of employment contracts on job satisfaction are relatively mixed. Although workers on indefinite-term contracts (ITCs) should a priori be more satisfied at work than their counterparts on temporary contracts, estimates by Origo and Pagani (2008) indicate that this is in fact the case in only a few countries, sucah as Sweden, Germany and the UK. Ferrer-i-Carbonell and van Praag (2006) find that job satisfaction is also negatively correlated with temporary contracts in Spain and Bardasi and Francesconi (2003) obtain a similar outcome for the UK when focusing on seasonal-casual jobs. Waaijer et al. (2016) further estimate that temporary contracts with no prospect of a stepping stone to permanent jobs leads to less job satisfaction among PhD graduates in the Netherlands.

According to Bruno *et al.* (2016), the lack of job stability is the most important cause of lower satisfaction among FTC workers and the self-employed. Yet, while FTC workers may compensate for this lack with other aspects of their work (such as job content, pay, and skills development perspectives) and achieve levels of satisfaction comparable to those of ITC

workers, this would not be the case for the self-employed, who therefore would turn out to be significantly less satisfied.

Some researchers approaching job satisfaction through health and well-being indicators also point out that FTC workers feel unsecure, have a bad working attitude towards their employers, perform badly and would consequently experience lower levels of well-being (Klein Hesselink and van Vuuren, 1999). According to Wagenaar *et al*. (2012), the highest overall quality of working life and work satisfaction is encountered among workers with permanent contracts, whereas the lowest is experienced by temporary agency workers.

However, fixed-term contracts do not necessarily reduce job satisfaction. According to Canzio *et al.* (2023), it would depend on the reason for being a temporary worker. Their results indicate that only unvoluntary temporary workers are less satisfied. Among these workers, they also find that shorter contracts exacerbate the negative effects on job satisfaction.

Moreover, other researchers estimate a positive relationship between FTCs and job satisfaction (Henneberger *et al*, 2004, in Beckmann *et al*, 2009; Green *et al*., 2010) that could be explained by: the opportunity provided by such contracts to get out of unemployment (Beckmann *et al*., 2009), the higher motivation resulting from the expectation that FTCs can provide a stepping stone to future permanent jobs (Bekmann *et al*., 2009), despite the fact that they may lead to less consideration on the part of the employer (Van Dyne and Ang, 1998, in Beckmann *et al*., 2009). According to Krausz (2000), workers who prefer temporary to permanent contracts would have higher levels of overall intrinsic and extrinsic satisfaction, as well as lower levels of stress. Additionally, although temporary workers occupy by definition more insecure jobs in terms of perspectives, such insecurity would not automatically act as a stressor for them, and thus not necessarily reduce their job satisfaction.

While the nexus between FTCs and job satisfaction has been well documented, the moderating role of FTCs in the relationship between overeducation, overskilling and job satisfaction has, to our knowledge, not yet been sudied. However, as Peiro *et al.* (2010) suggest, it is likely that the relationship between educational mismatch and job satisfaction is influenced by variables such as wages, type of employment contract or work experience. These authors are the first to make overeducation (considered alone) and job satisfaction interact with the type of labour contract. They suggest that permanent contracts may be seen as valuable rewards in the labour market that can further act as a buffering variable softening the negative impact of overeducation on job satisfaction. However, their results do not confirm a significant effect of the type of labour contract on the relationship between overeducation and job satisfaction, and the authors thus conclude that this variable does not necessarily serve as a buffer.

It can also be hypothesised that the effects of overeducation and overskilling on job satisfaction may depend on whether workers are employed on FTCs or ITCs by referring to the literature on corporate social responsibility (CSR). CSR assumes that an equilibrium has to be achieved between organizations', stakeholders' and workers' benefits/well-being in order to improve firm performance, working conditions, and firm longevity (ORSE, 2009). CSR is likely to improve the social climate within companies and consequently also their performance (Giuliano *et al.*, 2016). In turn, the relationship between overeducation, overskilling and job satisfaction may be worsened (improved) when workers evolve in a less (more) favourable social climate. Regarding the role of labour contracts, the impact of overeducation and/or overskilling on job satisfaction may be relatively aggravated (ameliorated) if FTC workers see their employment contract (or not) as a stepping stone to a better ITC.

According to De Witte and Naswall (2003), temporary employment contracts have until now generally been perceived as precarious and atypical jobs. Fixed-term contracts are indeed

often associated with lower pay (Mertens and McGinnity, 2004), poorer working conditions (Gash, 2004), and reduced access to benefits (McGovern *et al*. 2004). For these reasons, FTCs are also likely to be a significant moderator in the relationship between overeducation, overskilling and job satisfaction.

3. Modelling and estimating the job satisfaction relationships

*3.1. The effect of o*vereducation

A first probit equation specifies the impact of (education and) overeducation on job satisfaction by relating the average years of (attained education and) overeducation of a worker *i* to her probability of being satisfied on the job, as follows:

$$Pr\,(Y_i = 1|X) = \phi_1\,(\beta_0 + \beta_1\,Over_i + \beta_2\,Attained_i + \beta_3\,Z_i) \qquad (1)$$

where:

Y_i is the job satisfaction of worker *i*, defined as a binary variable that takes the value 1 when the worker self-assesses as satisfied, 0 otherwise ;

$Over_i$ is the number of years of overeducation of worker *i*, computed as the difference, as self-assessed by worker *i*[1], between the number of years of education attained by worker *i* and the

[1]Mahy *et al.* (2015) present three ways in the literature to measure the level of required education and thereby overeducation. First, the job analysis method is based on the evaluation by professional analysts of the level and type of education that is required for a specific job. Second, survey techniques on employee and/or employer can be used. This subjective or self-assessment method requires the employee/employer to determine the type and level of formal education that is necessary for the achievement of the tasks associated with a given job. Third, the realized matches method is based on the educational attainment of workers in each range of occupation. Required education is generally computed on the basis of the mode of the education in a given occupation.
Each method has its own advantages and shortcomings (see Mahy *et al.*, 2015 for a discussion). The choice of one method is often driven by the data available.

number of years of schooling required to get the job when the difference is positive, 0 otherwise[2];

$Attained_i$ is a vector corresponding to a set of 5 dummies representing the attained level of education of worker *i:* lower secondary education, upper secondary education, post-secondary education, tertiary education first stage, or tertiary education second stage (primary education serving as the reference category);

Z_i represents a vector of control variables associated with worker *i*, namely the gross monthly wage, the experience on the job computed as the number of years of tenure, the study field (14 dummies), the country where the worker operates (28 dummies), the age of the worker (in categories, i.e. younger than 30 or older than 49 years), gender, whether the worker is working part-time, as well as the type of contract (fixed-term or indefinite-term), the sectorial affiliation (16 dummies), and the size of the firm (4 dummies) in which the worker is employed.

[2]As detailed by Vermeylen (2016), in the dataset, workers have been asked to self-assess the level of education which is needed to get their jobs. Comparing this level of education with the highest level of education attained by each worker allows us to determine whether respondents are working above or below their own level of education. To do so, two specific questions are asked to respondents during the interview, allowing to define a worker as over-educated or not:
- *What is the highest level of education or training (ISCED_Qualification) that you have completed?*
- *What is the level of qualification (ISCED_Qualification) needed to get your job?*
A worker is then defined as over-educated if her level of attained education is above the level of education that is required *to get* her job.
Next, two questions allow to define a worker as over-skilled or not:
- *What is the highest level of education or training (ISCED_Qualification) that you have completed?*
- *What is the level of qualification (ISCED_Qualification) needed to do your job?*
A worker is then defined as overskilled if her level of qualification is above the one required *to do* (*i.e.*, to perform) her job.
An additional source of originality of this contribution lies in the fact that we are also able to compute the magnitude of over-education and over-skilling by relying on precise information on the level of attained (*i.e.* completed) education and skills of the worker together with the requirements to get (required education) and to do (required skills) the job. To do so, we associate each attained level of education and skills with a given number of equivalent years of education, by relying on the following rule: ISCED_1 is equivalent to primary education: 6 years of education; ISCED_2 relates to lower secondary education: 9 years of education; ISCED_3 is equivalent to upper secondary education: 12 years of education; ISCED_4 to post-secondary non-tertiary education: 14 years of education; ISCED_5 to first stage of tertiary education: 16 years of education; and finally ISCED 6 relates to second stage of tertiary education: 17 years of education. In fine, comparing the number of years of attained education (skills) of a worker with the one required to get (to do) the worker's job gives us the number of years of over-education (over-skilling).

3.2. The impact of overeducation and overskilling

The second probit equation investigates the impact on job satisfaction of overeducation and overskilling interacted together, where the overeducation variable specified in equation (1) is replaced by a vector of three interacting (over)education and (over)skilling variables:

$$Pr\,(Y_i = 1|X) = \phi_2\,(\gamma_0 + \gamma_1\,AppMatch_i + \gamma_2\,AppOver_i + \gamma_3\,GenOver_i + \gamma_4\,Attained_i + \gamma_5\,Z_i) \quad (2)$$

where:

$AppMatch_i$ is the number of years of apparent matching, *i.e.,* the situation in which the worker *i* considers that she possesses the required level of education and is overskilled. The associated coefficient gives us the impact of an additional year of overskilling for a worker being properly educated for her job;

$AppOver_i$ is the number of years of apparent overeducation, *i.e.,* when the worker *i* considers herself as overeducated and properly skilled for her job. The associated coefficient gives us the impact of an additional year of overeducation for a worker being properly skilled for her job;

$GenOver_i$ is the number of years of genuine over-education, *i.e.,* when the worker *i* considers herself as overeducated and overskilled. The associated coefficient gives us the impact of an additional year of overeducation for a worker being overskilled for her job.

As such, the coefficients of our probit model may not be interpreted in a standard way. They give us information about the sense of the relationship between the dependent and the independent variables, but they do not provide information about the magnitude of the impacts. In order to be able to interpret such effects, we report the marginal effects of the probit model as estimated by using the margins procedure in Stata, each effect representing the impact of a change in the explaining variable Z_{ki} on the probability for the worker to be satisfied ($Y_i = 1$).

3.3. The moderating role of employment contracts

In order to test whether the relationship between overeducation, overskilling and job satisfaction depends on the worker's type of employment contract, we regress equation (2) on two subsamples made up of FTC and ITC workers respectively.

4. Dataset and descriptive statistics

In order to estimate our relationships, we rely on a rich pan-European dataset, namely the CEDEFOP 2014 European Skills and Jobs Survey (ESJS). This survey aims at assessing the extent to which respondents' qualifications and skills correspond to the level required to do their job. The survey has the advantage of providing a large number of educational and skill mismatch indicators. Moreover, it provides a wide range of control variables, thus improving the relevance and accuracy of the analysis. CEDEFOP commissioned Ipsos and network partners to carry out this survey between 7 March and 26 June 2014. It was carried out by telephone and online among 48,676 employees aged between 24 and 65 in the 27 EU Member States and the UK. An initial questionnaire was designed by Cedefop, then refined by Ipsos and Cedefop. The final cross-sectional sample contains 23,123 observations.

In Table 1, we present the descriptive statistics of selected variables. Column 2 shows that 78.1% of the European workers in our sample consider themselves satisfied with their jobs. In terms of attained level of education, we see that 0.4% of respondents have primary education, 7.3% lower secondary education, 25.2% upper secondary education, 11.1% post-secondary education, 48.3% first-stage tertiary education, and 7.7% tertiary education at an advanced stage. Turning to our main variables of interest, we find that 26.4% of sampled workers consider themselves as overeducated, which corresponds to an average of 0.85 years of overeducation, and 28.9% as overskilled, which corresponds to an average of 0.93 years of overskilling. Next,

the interaction variables show that 5.3% of workers are apparently matched, *i.e.* properly educated but overskilled, 2.5% apparently overeducated, *i.e.* overeducated but possessing required skills, and 23.6% genuinely overeducated, *i.e.* they consider themselves as both overeducated and overskilled. As regards the type of labour contracts, 11.6% of the workers in the sample are employed on fixed-term contracts, 84.2% on indefinite-term contracts and 4.3% on other contracts.

If we then distinguish between the descriptive statistics for workers on fixed-term and indefinite-term contracts (see columns 3 and 4), it appears that workers on FTCs consider themselves (slightly) less satisfied at work (77.2%) than those on ITCs (78.6%). Concerning our main explanatory variables, we find that a larger proportion of workers on FTCs than on ITCs are overeducated (27.9% vs 25.8%) and overskilled (30.6% vs 28.3%), and accordingly that a larger proportion of FTC workers are genuinely overeducated (25.2% vs 23.1%). Compared to ITC workers, those on FTCs are younger and more often women. On average, FTC workers also earn lower wages, have less tenure and are more often part-timers.

[Insert Table 1 about here]

5. Results

5.1. The impact of overeducation

In Table 2, we present the results of equation (1), focussing on the impact of years of overeducation on job satisfaction. The marginal effects from the probit estimates are presented in the second column of Table 2. Overall, they show that the higher the level of education attained, the greater the probability of being satisfied in employment. More specifically, they show that workers with post-secondary or first-stage tertiary education are 8% more likely to be satisfied at work than their colleagues with secondary education or less, while workers with

an advanced degree of tertiary education are 10.7% more likely to be satisfied at work than their colleagues with no more than secondary education. These results are in line with those of Idson (1990), who suggests that higher levels of education are associated with higher levels of satisfaction, because of higher levels of autonomy, better promotion prospects, increased prestige, better employment conditions and more opportunities to develop skills.

With regard to our educational mismatch variable, results show that a one-year increase in overeducation reduces the probability of a worker feeling satisfied at work on average by 2.3%.

[Insert Table 2 about here]

5.2. The impact of overeducation and overskilling

The estimated impacts of overeducation and overskilling, considered in interaction, alongside the attained level of education, are presented in Table 3.

Turning first to the impact of education as such, our first column of results again shows that the higher the level of education attained by a worker, the greater her probability of being satisfied at work. Compared with our reference category of primary-educated people, we find that those with an upper secondary, post-secondary, first-stage tertiary and advanced tertiary education qualification are respectively 6.6%, 8.1%, 8.4% and 11.1% more likely to be satisfied with their jobs.[4]

Next, the marginal effects from our probit estimates show that apparent matching, apparent overeducation and genuine overeducation all have a significant negative impact on job

[4] The coefficients were tested for equality. The results (available on request) show that they are all statistically different from one another. This also applies to results discussed in the remainder of our analysis.

satisfaction. More precisely, each additional year of apparent matching (i.e. year of overskilling among adequately educated workers) reduces the probability of being satisfied on the job by 1.6%, compared with a well-match worker. In addition, we find that each year of apparent over-education (i.e. year of over-education among adequately skilled workers) reduces the probability of being satisfied at work by 1.4%. Finally, each year of genuine overeducation (i.e. year of over-education among overskilled workers) is found to decrease the probability of being satisfied on the job by 2.6%. These results suggest that the most unfavourable situation in terms of job satisfaction is that of workers who are both overeducated and overskilled. Being overeducated and overskilled would therefore incur a double penalty.

[Insert Table 3 about here]

5.3. The role of labour contracts

We now examine the moderating role of employment contracts in these job satisfaction relationships. Our main results are presented in the third and fourth columns of Table 3. They first show that an additional year of apparent matching (i.e. year of overskilling among adequately educated workers) reduces the probability of being satisfied to a bigger extent among workers with a FTC (-2.8%) than among those with an ITC (-1.5%). The same conclusion can be drawn regarding the impact of apparent overeducation and genuine overeducation. Indeed, a one-year increase in apparent over-education (i.e. year of over-education among adequately skilled workers) appears to be more than twice as detrimental to job satisfaction among workers with a FTC (-2.5 versus -1.1%). The impact of an additional year of genuine overeducation (i.e. year of over-education among overskilled workers) also

turns out to be significantly higher among FTC workers, but the magnitude of the difference with ITCs now reaches 0.5% points[5].

6. Conclusion and discussion

Overeducation and overskilling are important phenomena in Europe. This paper is the first to examine whether and how these phenomena, considered separately and in interaction, influence workers' job satisfaction among 28 European countries. The moderating role of workers' employment contracts (i.e. fixed-term or indefinite) in these relationships is also examined.

Practically, we have estimated a probit model in which the probability of a worker being satisfied in her job depends on whether she is (i) apparently matched, i.e. correctly educated but overskilled, (ii) apparently overeducated, overeducated but correctly skilled, or (iii) genuinely overeducated, both overeducated and overskilled.

Using the European Skills and Jobs Survey (ESJS) covering 23,123 workers in 2014, our results first show that a one-year increase in apparent matching, i.e. an additional year of overskilling among adequately educated workers, has a significant negative impact of -1.6% on the probability of being satisfied at work. As for the effect of apparent overeducation, it turns out to be fairly similar: an additional year of overeducation among adequately skilled workers is found to reduce job satisfaction by -1.4%. Finally, with regard to genuine overeducation, the estimates indicate that an additional year of overeducation among overskilled workers entails a reduction in the probability of job satisfaction of 2.6% on average. The drop in job satisfaction for genuinely overeducated workers is therefore almost double, i.e. the penalty associated with being both overeducated and overqualified tends to add up.

[5] We also tested whether workers' age might influence the way in which labour contracts affect the estimated relationships. The results, available on request, show no specific changes in the probability of being satisfied at work when comparing older and younger mismatched workers.

Turning next to the role of labour contracts on workers' appraisal of job satisfaction, results show that additional years of apparent matching, apparent overeducation and genuine overeducation all reduce the probability of being satisfied at work to a greater extent among FTC workers than among those on ITCs. In line with the CSR literature, these findings support the idea that ITCs are associated with a better social climate at work, leading mismatched workers to be less dissatisfied with their jobs. Furthermore, as pointed out by Peiro *et al.* (2010), they suggest that ITCs are perceived as valuable rewards on the labour market, acting as a buffer variable softening the negative impact of over-education on job satisfaction.

As far as personnel policies are concerned, our results suggest that firms targeting workers' job satisfaction should avoid employing overeducated, overskilled, but above all genuinely overeducated workers (i.e. workers that are both over-educated and overskilled), particularly when the latter are on FTCs.

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Table 1 - Descriptive statistics of selected variables (mean values, 2014)

Variables	Means (Std Dev)		
	Overall	FTCs	ITCs
Satisfied workers (in %)	78.09 (0.27)	77.20	78.58
Attained level of education (% of workers)			
Primary education	0.39 (0.04)	0.49	0.35
Lower secondary education	7.30 (0.17)	7.29	7.13
Upper secondary education	25.21 (0.29)	24.76	25.17
Post-secondary education	11.11 (0.21)	10.99	10.99
Tertiary education first stage	48.26 (0.33)	48.43	48.50
Tertiary education advanced stage	7.74 (0.18)	8.03	7.85
Attained education (on average, in years)	14.30 (0.016)	14.31	14.32
Overeducation			
Percentage of workers	26.35 (0.29)	27.91	25.75
Years of overeducation	0.85 (0.11)	0.99	0.81
Overskilling			
Percentage of workers	28.92 (0.30)	30.64	28.32
Years of overskilling (computed as years of education in surplus)	0.93 (0.01)	1.09	0.88
Interaction between (over)education and (over)skilling			
Apparently matched (in % of workers)	5.28 (0.15)	5.42	5.25
Apparently overeducated (in % of workers)	2.51 (0.10)	2.62	2.47
Genuinely overeducated (in % of workers)	23.64 (0.28)	25.22	23.07
Wages (euros)	645.49 (135.53)	3.316	8.493
Women (%)	44.70 (0.33)	50.75	43.76
Workers with 10 years or more of tenure (%)	41.27 (0.32)	8.86	46.40
Share of workers < 30 years	43.97 (0.32)	60.54	41.63
Share of workers between 30 and 49 years	43.24 (0.33)	31.28	45.18
Share of workers > 49 years	12.77 (0.22)	8.18	13.19
Part-time (%)	13.50 (0.22)	23.09	11.25
Fixed-term contracts (%)	11.57 (0.21)		
Indefinite-term contracts (%)	84.15 (0.24)		
Sector (%)			
Agriculture, horticulture, forestry or fishing (A)	1.68 (0.08)	1.91	1.60
Supply of gas or electricity, mining or quarrying (B+D)	1.91 (0.09)	1.16	2.04
Supply, management or treatment of water or steam (E)	0.99 (0.07)	0.64	1.07
Manufacturing or engineering (C)	13.63 (0.23)	10.54	14.21
Construction or building (F)	5.32 (0.15)	5.53	5.13
Retail, sales, shop work or whole sale (G)	9.49 (0.19)	9.45	9.53
Accommodation, catering or food services (I)	2.92 (0.11)	5.04	2.54
Transportation or storage (H)	5.52 (0.15)	4.41	5.66
Information technology or communication services (J)	6.48 (0.16)	4.52	6.74
Financial, insurance or real estate services (K+L)	5.44 (0.15)	3.77	5.78
Professional, scientific or technical services (M)	7.26 (0.17)	8.48	7.13
Administration and support services, including public (N+O)	12.34 (0.22)	11.29	12.49
Services relating to education or health (P)	18.24 (0.25)	21.64	17.91
Cultural industries (arts, entertainment or recreation) (R)	1.96 (0.09)	3.21	1.74
Social and personal services (Q)	5.86 (0.15)	7.40	5.48
Other	0.96 (0.06)	1.00	0.95
Size			
Small	28.17 (0.30)		
Medium	25.97 (0.29)		
Large	24.18 (0.28)		
Number of observations	23,123	2,676	19,457

Table 2 - Job satisfaction and overeducation, global specification. Marginal effects from probit estimates

Dependent variable	**Job satisfaction Marginal effects**
Overeducation (in years)	-0.024***
	(0.002)
Length of Studies	
Lower secondary education (dummy)	-0.005
	(0.042)
Upper secondary education (dummy)	0.063
	(0.041)
Post-secondary education (dummy)	0.080*
	(0.041)
Tertiary education first stage (dummy)	0.079*
	(0.041)
Tertiary education advanced stage (dummy)	0.107**
	(0.042)
Control variables[a]	YES
LR Chi^2	815.31***
p-value	0.000
Pseudo R^2	0.036
Number of firm-year observations	23,123

Notes: Robust standard errors are reported between brackets. ***, **, * significant at the 1, 5 and 10% level, respectively.[a] Are included as control variables: the gross monthly wage (in ln), the experience on the job computed as years of tenure, the shares of the workforce that is younger than 30 and older than 49 years, respectively. Are also included: the shares of women, part-time workers, and workers under fixed-term contracts, as well as the study field of the worker (14 dummies), the country where the worker operates (28 dummies) and the sectorial affiliation of the firm in which the worker operates (16 dummies).

Table 3- Job satisfaction, overeducation and overskilling, specifications on the whole sample and by types of labour contract. Marginal effects from probit estimates.

Dependent variable	**Job satisfaction**		
	Overall specification Marginal effects	**FTC workers Marginal effects**	**ITC workers Marginal effects**
Apparent matching (in years)	-0.016***	-0.028***	-0.015***
	(0.003)	(0.008)	(0.004)
Apparent overeducation (in years)	-0.014***	-0.025*	-0.011**
	(0.005)	(0.013)	(0.005)
Genuine overeducation (in years)	-0.026***	-0.030***	-0.025***
	(0.002)	(0.004)	(0.018)
Length of Studies			
Lower secondary education (dummy)	-0.005	0.111	-0.040
	(0.042)	(0.110)	(0.048)
Upper secondary education (dummy)	0.066*	0.194*	0.028
	(0.041)	(0.107)	(0.048)
Post-secondary education (dummy)	0.081**	0.208*	0.041
	(0.041)	(0.109)	(0.048)
Tertiary education first stage (dummy)	0.084**	0.219**	0.046
	(0.041)	(0.107)	(0.048)
Tertiary education advanced stage (dummy)	0.111***	0.281**	0.072
	(0.042)	(0.111)	(0.049)
Control variables[a]	YES	YES	YES
LR Chi^2	844.21***	181.73	649.93
p-value	0.000	0.000	0.000
Pseudo R^2	0.037	0.065	0.035
Number of firm-year observations	23,123	2,676	19,457

Notes: Robust standard errors are reported between brackets. ***, **, * significant at the 1, 5 and 10% level, respectively. [a] Are included as control variables: the gross monthly wage (in ln), the experience on the job computed as years of tenure, the shares of the workforce that is younger than 30 and older than 49 years, respectively. Are also included: the shares of women, part-time workers, and workers under fixed-term contracts, as well as the study field of the worker (14 dummies), the country where the worker operates (28 dummies) and the sectorial affiliation of the firm in which the worker operates (16 dummies).