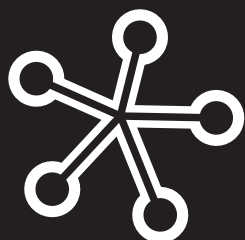# AIAS

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Over- and underqualifiction of migrant workers

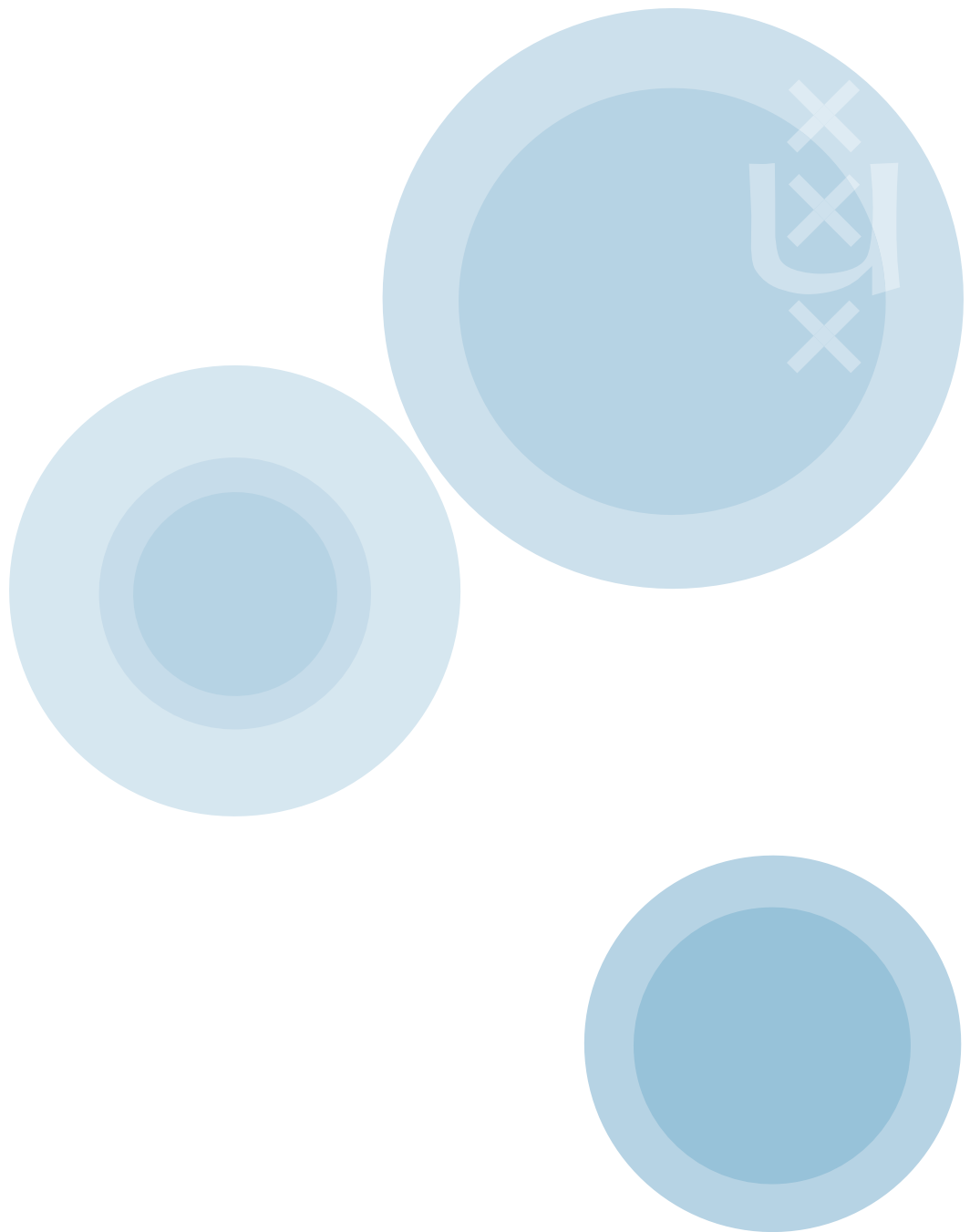## Evidence from *WageIndicator* survey data

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Abstract

Are overeducation and undereducation more common for migrants compared to domestic workers? If so, is overeducation and undereducation similar across migrants from various home countries and across various host countries? This paper aims at unravelling the incidence of skill mismatch of domestic and migrant workers employed in 13 countries of the European Union, namely Belgium, Denmark, Finland, France, Italy, the Netherlands, the Czech Republic, Hungary, Poland, Slovakia, Spain, Sweden, and the United Kingdom. Here migrants are defined as workers not born in the country where they are currently living. They originate from more than 200 countries, thereby reflecting a heterogeneous group, ranging from migrants for economic reasons and refugees, to expats, intercultural married, and others. Concerning over-education, most of the literature points to explanations related to job allocation frictions. The theoretical explanations for overeducation all refer to job allocation frictions. They apply to workers in general at first job entry, to particular groups of workers at first job entry such as re-entering housewives or workers who have experienced unemployment spells and involuntary quits, to workers accepting a lower-level job if the probability of promotion is higher, to imperfect information from the employer's side associated with a lack of transparency of diplomas or of transferability of credentials, to poor abilities of individual workers, and to labour market discrimination. Six hypothesis have been drafted for empirical testing. One hypothesis has been made for undereducation. This is assumed to be the case for workers with higher abilities, here defined as workers in supervisory positions. This paper builds on statistical analyses of the data of the large *WageIndicator* web-survey about work and wages, posted at all national *WageIndicator* websites and comparable across all countries. Using the pooled annual data of the years 2005-20010, we used 291,699 observations in the analysis. The large sample size allows a break-down of migrant groups according to country of birth in order to better capture the heterogeneity of migrants. Logit analyses have been used to estimate the likelihood of being overqualified compared to having a correct match or being underqualified. Similar estimations have been made for underqualification compared to having a correct match or being overqualified.

One of five workers asseses to be overqualified (20%). When comparing the domestic and migrant workers, overqualification occurs less often among domestic workers than among migrant workers (19% versus 24%). The analyses show that overeducation occurs indeed more often among migrant workers. Yet, the analyses also reveals that the overeducation occurs substantially more often in the old EU member states compared to newly accessed EU member states, regardless being a domestic worker or a migrant. The

model shows that the heterogeneity of the migrant groups should be taken into account. Of all migrant and domestic groups, the odds ratio of being overqualified is highest for migrants working in EU15 and born in EU12. The odds ratio decreases for the migrants from USA, Canada and Australia. The odds ratio of being overeducated increases with educational attainment. It decreases with hierarchical level within the occupation, with the the corporate hierarchical levels, and with the skill level of the job. The hypothesis regarding job allocation frictions are confirmed. The odds ratios of being overqualified increase for recent labour market entrants, for workers with an employment spell, for female workers, for migrants who arrived at an adult age thus challenging the transparency of credetials in the host country, and for for 1st and 2nd generation migrants and ethnic minorities thus challenging discrimination in the labour market. No support was found for the hypothesis that workers with presumably poor language abilities are more likely to be overeducated. Concerning undereducation, the analyses confirm that having a supervisory position increases the odds ratio of being underqualified. This suggest that underqualified workers with higher capabilities provide internal career ladders. This study in part confirms the existing literature, in particular the job allocation frictions for the entire labour market. It expands existing empirical findings concerning the reasons why migrants are more likely to be overeducted.

1.   Introduction

Recently, OECD (2011) announced to be preparing a global Skills Strategy, aiming to stimulate countries to make optimal use of existing skills, to prevent waste and attrition of skills due to mismatch or lack of use, and to encourage employers to demand higher level of skills in stagnating regions or sectors are equally important elements of skills policies. The OECD publication touches upon the issue of skill mismatch of migrants, stating that not all migrants make full use of their skills in the host country, it does not detail the differences between skill mismatches of natie workers and migrants. This paper aims to fill in the gap for a number of European countries.

Are overeducation and undereducation more common for migrants compared to domestic workers? If so, is overeducation and undereducation similar across migrants from various home countries and across various host countries? This paper aims at unravelling the incidence of skill mismatch, defined as the situation in which workers occupy jobs for which lower respectively higher skill levels are required compared to their current educational level. We focus on skill mismatch of domestic and migrant workers employed in 13 countries of the European Union, namely Belgium, Denmark, Finland, France, Italy, the Netherlands, the Czech Republic, Hungary, Poland, Slovakia, Spain, Sweden, and the United Kingdom. Due to data limitations countries as Germany, Austria or Ireland could not be included, although these countries in the recent past have attracted a substantial number of migrants. Here migrants are defined as workers not born in the country where they are currently living. In the sample they originate from more than 200 countries, thereby reflecting a heterogeneous group, ranging from migrants for economic reasons and refugees, to expats, intercultural married, and others.

The academic discourse on mismatch in the labour market covers issues such as residential mismatch and hours mismatch, but this paper focuses on the skill mismatch. The literature on skill mismatch can be classified into three categories. A number of studies investigate the incidence of over- and undereducation, some of which provide breakdowns for groups in the labour market, such as by gender and firm size. Many studies address the impact of over- and undereducation, mostly on wages. Finally, an important body of knowledge relates to the dynamics of overeducation, that is how educational requirements and the educational composition of the workforce have changed over time.

This paper addresses solely skills mismatch, focussing on the incidence of over- and undereducation. As as pointed out by Leuven and Oosterbeek (2010) in their overview study, only few studies have addressed the incidence of over- and undereducation of migrants. Our data is particularly suited to investigate differences in skill mismatch between domestic and migrant workers. We contribute to the body of knowledge on over- and undereducation in particular as we are able to provide a detailed break down in migrants from a wide variety of home countries. Our first research objective is to investigate whether migrants are more often over- and underqualified compared to domestic workers. The second objective is to investigate whether a range of theoretically based assumptions, including assumptions related to migrants, affect the incidence of over- or undereducation.

Given these research objectives, other objectives have not been studied here. Although using a pooled dataset covering the years 2005-2010, this paper does not investigate the impact of the economic crisis on skill mismatch. Understanding the incidence of over- and undereducation is a condition before being able to hypothesize the impact of the crisis on this phenomenon. Similarly, the paper does neither investigate the impact of per- and post-access intra-EU15 migration nor the impact of national migration policies on the incidence of over- and undereducation. The latter would require an investigation of these policies for a long period of time, because our data includes migrants who arrived in the country of destiny even before the 70's. This asks for a separate study on the impact of migration policies.

The outline of this paper is as follows. Section 2 goes into the theoretical and empirical literature with regard to skill mismatch of migrant and domestic workers. In section 3 data and methods are described. We present our results in section 4. Section 5 discusses our findings and conclusions.

2. Review of the literature on migrants' skill mismatch and earnings

2.1. What is skill mismatch?

Skill mismatch refers to the mismatch between a worker's educational attainment and the requirements of the job occupied, whereby several types of skill mismatch are distinguished (e.g. McGuinness and Sloane, 2011). A vertical mismatch refers to workers possessing an education that either exceeds or is below the educational level required for their jobs. Here, the terms overeducation respectively undereducation are used, which are also refered to as overschooling and undereducation. Educational level is a crude measure to indicate an individual's educational attainment or job requirements. For jobs, the skill based approach seems more adequate, as are the terms overskilling respectively underskilling indicate. Yet, skills are more difficult to measure than educational attainment. The most common method is to measure an individual's generic skills, for example in cognitive tests or in OECD's IALS and PIAAC literacy surveys, whereas job-specific skill requirements are hardly used because these are far more difficult to measure. A horizontal mismatch refers to workers who are educated in another field than their job requires. Particularly in Germany, the concept of occupational mismatch is clearly distinguished from that of educational mismatch because of the country's widespread vocational training system, providing the majority of the labour force with a generally accepted qualification for a wide range of occupations (Burkert and Seibert, 2007). This paper focuses solely on vertical skill mismatch, defined as overeduation and undereducation, because the data does not allow to detail skills and skill requirements and thus horizontal mismatch.

Studying skill mismatch requires information about the educational attainment of individuals as well as insight into the educational level required for jobs. The former is less disputed than the latter. In country-specific surveys the educational attainment of individuals is mostly measured using national educational categories. For cross-country comparisons the ISCED classification is mostly used, applying seven educational attainment levels (OECD, 1999). On behalf of collecting information about educational job requirements, the most frequently applied method is asking individual workers to indicate the educational attainment required for their job or to indicate whether they have sufficient skills to perform their job. This is called the subjective method, because it is based on surveys implying worker's self-assessment (Van der Velden and

Van Smoorenburg, 1997; Groot and Maassen van den Brink, 2000; Jensen *et al*, 2007; Leuven and Oosterbeek, 2010; Piracha *et al*, 2010). A second method is called the objective method, because it is based on expert classification of the required education and skills of jobs. Here, a wide range of approaches can be noticed. One approach is to classify jobs according to broad job levels, for example the four skill levels ranging from unskilled to highly skilled, distinguished by the International Labour Organisation (ILO) in the first digit of its ISCO-08 occupational classification (ILO, 2007). In many countries, national statistical agencies have adopted ISCO in their Labour Market Surveys, either by classifying occupations directly into ISCO or by using cross-over tables from a national occupational classification. Statistics Netherlands has undertaken an attempt to classify the 1,200 occupations in its SBC classifiation into seven job levels (CBS, 1993). O*net, the occupations database in the United States, indicates skill requirements for a large range of occupations, based on desk research and company visits (O*net, 2002).[1] A third method is called the empirical method, whereby the mean years of schooling of all workers in a given occupation or group of occupations are compared to the schooling of an individual in the occupation. Individuals are defined to be overeducated if their schooling level is more than one standard deviation above the mean of all individuals in that occupation (Clogg and Shockey, 1984; Verdugo and Verdugo, 1989; Van der Velden and Van Smoorenburg 1997).

Objections have been raised to all three methods. The first method is critized because workers may be inclined to overstate the educational requirements of their job or to simply equate these requirements to their own level of education (Hartog and Jonker 1997). Furthermore, respondents may not always have good insights in the level of education required for a job (Cohn and Khan, 1995; Halaby, 1994). The second method, the objective one, is critized because skill requirements within a given occupation cannot vary (Halaby, 1994). Based on a survey of school-leavers Van der Velden and Van Smoorenburg (1997) conclude that job analysts systematically overestimate the level of required education, most likely because they do not use the 'real' situation as the basis of their rating, but descriptions of the tasks and the nature and required level of knowledge and skills. The third method also ignores the variation in educational requirements within an occupation. Additionally, the choice for one standard deviation seems rather arbitrary (Halaby, 1994). Therefore, Hartog and Jonker (1997), and Verhaest and Omey (2006) even conclude that this should be the least preferred method for determining overschooling.

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1   For the purpose of matching job seekers to vacancies, skill requirements need to be far more detailed. This is usually done by professional job analysts, analysing skill requirements in job advertisements, studying realized job matches or undertaking company studies of required skills. However, this method typically addresses a selected set of occupations and does not cover all occupations in a national labour market, as the latter is a huge undertaking.

2.2. The incidence of skill mismatch

All studies on skill mismatch conclude to the existence of overeducation. Based on their meta-analysis of more than 180 studies covering five decades and countries in Asia, Europe (predominantly EU15), America's and Australia, Leuven and Oosterbeek (2010) conclude that on average 30% of the workforce is overeducated and 26% is undereducated. Overeducation is less often found in Latin-America and most often in the USA/Canada. From the 1970s to the 1990's overeducation has been declining, but the 2000s reveal an increase, though the autors note that this might be due to only one 2008 study. In an earlier meta analysis, Groot and Maassen van der Brink (2000) conclude that the overall incidence of overeducation in the labour market appears to be about 26%.

The incidence of overeducation is likely to be affected by the measurement method. According to Leuven and Oosterbeek (2010) the studies based on self-assessment methods and the job analyses methods do not reveal large differences in this respect, but the method on the mean reveals lower levels of overeducation. Groot and Maassen van der Brink (2000) find that overeducation is more frequent when selfreported rather than when objective measures are used. Leuven and Oosterbeek have found that many studies have estimated probit or similar binary models of the determinants of overeducation and undereducation, but that the specifications of these models vary widely. More or less consistent findings across studies are that young people, women and migrants are more likely to be overeducated. Remarkably little findings refer to the incidence of overeducation for specific educational categories. Mavromaras *et al* (2009), analyzing the Australian HILDA Survey 2001-2006, have found that overeducation occurs more often in the top half of the education brackets than in the lower half, pointing to a relative lack of high-skilled jobs.

According to Leuven and Oosterbeek (2010), only few studies have addressed the incidence of over- and undereducation of migrants. The available evidence points out that migrants are more likely to be over-educated. In a study based on the Labour Force Survey in the United Kingdom, Lindley and Lenton (2006) suggest that immigrants initially experience higher over-education but that this difference is eroded with time spent in the UK. In a study based on the Longitudinal Survey of Immigrant Australians (LSIA) Green et al (2007) conclude that migrants are more likely to be overeducated than the native population, even if the migrants have entered the country at stake on skill-based visas. They were better educated than the native born population but were relatively less likely to be found in managerial and professional occupations and were over represented in unskilled work. The authors find that overeducation is greatest for migrants from Non-English speaking backgrounds. Further details concerning home countries are provided by Battu and

Sloane (2002), using a survey of Ethnic Minorities in the UK. They conclude that different ethnic groups have varying levels of overeducation, with the highest incidence of overeducation amongst the Indian and Africa-Asian groups. However, the results of a study of the high-skilled US labour market by Chiswick and Miller (2009) show that overeducation is widespread, both among migrants and native-born. In the US, the extent of overeducation declines with duration as high-skilled migrants obtain jobs commensurate with their educational level. Using the Longitudinal Survey of Immigrants to Australia, Piracha *et al* (2010) reveal that a significant part of the variation in the migrants' probability to be over- or undereducated in the Australian labour market can be explained by having been over- or undereducated in the last job in the home country. Home-country mismatch was notably large in the case of undereducation.

So far, the dynamics of over- and undereducation over time and their methodological implications have not been discussed,refering among others to the massive literature on upgrading and downgrading of occupations. In the last 15 years, much of this literature is devoted to the so-called skill-biased technological change, assuming (and largely confirming) that in developed countries educational requirements for a similar job within industries have increased over time, mainly due to technological developments (Berman *et al*, 1998; Machin, 2001; Autor *et al*, 2001). Upgrading will imply that with tenure the incidence of undereducation increases, whereas downgrading works out the other way. A second dynamic process refers to the inflation of qualifications, implying that new entrants are more likely to be overeducated. Third, dynamics over time may also be caused by fluctuations in labour market conditions, with alternating periods of scarce and excess labour supply: in periods of scarce supply new entrants are more likely to be undereducated, whereas the reverse holds for entrants in periods of excess supply. No studies have yet revealed the impact of the economic crisis on the skill structure of the labour market, whether losses have targetted high skilled job more than low skilled jobs or vice versa. Finally, in a study about skill mismatch among migrants the dynamics over time caused by national migration policies should be taken into account. Policies stimulating access for high-skilled migrants may affect the educational composition of relevant cohorts of migrants, but this also applies for more restrictive policies towards migration. This study does not consider these dynamic processes.

Few empirical attempts have been undertaken to investigate the longitudinal impact of over- and undereducation, while a legitimate question is whether job allocation frictions diminish over time. Korpi and Tahlin (2009) do not find support for the assumption that mismatch dissolves with the time individuals spent in the labour market. Using cross-sectional and panel data from the Swedish Level of Living surveys

1974-2000, the authors conclude that the overeducated are penalized early on by an inferior rate of return to schooling from which this group does not recover.

A final caveat has to be made here. Following Piracha *et al* (2010), a match or mismatch is observed only for the employed individuals. Skill mismatches may be larger for the unemployed labour force, thus in case the educational level of the unemployed does not match the educational requirements of relevant job vacancies. When assuming a higher incidence of mismatch for migrants, the fact that they may constitute a self-selected sub-sample may be overlooked. In a similar vein, this will hold for migrants.

2.3.   Explanations for skill mismatch of migrants

In this section, we will explore the theoretical explanations of overeduction and undereducation, and the implications of such explanations for the higher incidence of over- and undereducation of migrants. Concerning overeducation, most of the literature points to explanations related to job allocation frictions. We found six explanations for overeducation, which we will treat successively here. A first explanation refers to the assumption that at first job entry workers might occupy jobs for which they are overeducated and later on move to jobs that match their educational attainment more. In their overview studies, Leuven and Oosterbeek (2010) and Cedefop (2010) conclude that according to many studies younger workers are more likely to be overeducated than older workers. This supports the assumption that overeducation is part of a adaptation process in the early stages of a working career, in which it compensates for the lack of other human capital endowments, such as ability, on-the-job training, or experience. Following this explanation, we will investigate in our empirical study job allocation frictions by testing the assumption that the incidence of overeducation is higher among workers that have recently entered the labour market.

A second explanation details the assumption of job allocation frictions. This explanation refers to specific groups of workers when entering the labour market. It is assumed that particularly students with a job on the side, re-entering housewives for which a job-education match does not rank high on their preferences, workers who have had unemployment spells and involuntary quits, and other workers whith poor bargaining power will occupy jobs for which they are overeducated. This assumption is supported by a range of research results. According to Groot and Maassen van den Brink (2000)), workers who have experienced a career break are more likely to be found in jobs for which they are overeducated. Sloane *et al* (1999) found that overeducated had more unemployment spells and involuntary quits than others. The evidence of Sicherman (1991) showed that overeducated workers changed jobs more frequently, and that they had less

experience, tenure and on-the-job training than correctly matched workers. In our empirical part, we will investigate this type of job allocation frictions by testing the assumption that the incidence of overeduction is higher among workers who have poor bargaining power, refering to spells and quits.

A third theoretical explanation of overeduction refers to job allocation frictions that are related to career mobility. This explanation assumes that individuals accept a lower-level job if the probability of promotion is higher (Sicherman and Galor, 1990) In our empirical study, we will test whether the incidence of overeducation is higher for jobs with good promotion prospects compared to jobs with average or poor promotion prospects.

A fourth theoretical explanation refers to job allocation frictions due to imperfect information from the employer's side, which is particularly associated with a lack of transparency of diplomas or of transferability of credentials (Cedefop, 2010; OECD, 2007). However, we did not encounter empirical studies who investigated this assumption. In our empirical study we assume that migrants who have arrived to the host country at an adult age will be more likely to overeducation, because this group will be confronted with this lack of transparency and transferability of their credentials.

A fifth theoretical explanation concentrates on job allocation frictions due to poor abilities of individual workers. This assumption goes beyond the crude measurement of educational attainment and details a worker' s ability as well as the skill requirements of a job. In particular one ability has been investigated, namely the worker's mastering of the native language or the lingua franca of the host country. Thus, in this approach the language ability of the worker is critical. According to a study for Australia, workers from a non-native-language speaking background showed a higher and persistent incidence of overeducation than those from a native-language speaking background (Kler, 2005). In our empirical study, we will test if migrants from home countries where the native language or the lingua franca does not match that of the home country are more likely to experience overeduction.

A sixth theoretical explanation refers to job allocation frictions due to labour market discrimination: employers have a preference for workers from their "same group". Field experiments show pervasive ethnic discrimination in many countries (OECD, 2007). In our empirical study, we will assume that migrants not born in the country of survey are more likely to be overeducated compared to domestic workers. In addition, in a few additional analyses we will also investigate if second generation migrants and individuals from ethnic minorities are more likely to be overeducated compared to domestic workers.

Concerning undereducation, fewer theoretical explanations exist. Empirical studies have focussed more often on overeducation than on undereducation. When explaining undereducation, the literature hardly points to job allocation frictions. The theoretical explanations for undereducation are mainly associated with careering. Workers with high abilities may may make promotions in the corporate hierarchy and their job level therefore ay increase, whereas their educational attainment will remain unchanged. This is consistent with the findings of Sloane *et al* (1999), showing that promotion and supervisory experience is least frequently found among the overeducated and most frequently among the undereducated. In our empirical study, we will test whether the incidence of undereducation is higher in supervisory positions.

3. Methods and data

3.1. Data and definitions

This paper builds on statistical analyses of the large *WageIndicator* dataset. The *WageIndicator* project is currently running in more than 50 countries on five continents. It consists of national websites, each receiving large numbers of visitors, primarily because the websites post a Salary Check that provides free information on occupation-specific wages. Worldwide, the national WageIndicator websites attract large numbers of web-visitors; in 2009 in total more than 10 million. The websites are consulted by workers for their job mobility decisions, annual performance talks or wage negotiations. The sites are also consulted by school pupils, students or re-entrant women facing occupational choices, or by employers in small and medium sized companies when recruiting staff or negotiating wages with their employees. The project website is www.wageindicator.org.

The *WageIndicator* dataset is derived from a web-survey about work and wages, posted at all national *WageIndicator* websites and comparable across all countries (Tijdens *et al*, 2010). The survey is in the national language(s) and adapted to country-specific issues, where needed. In return to the free information provided, visitors are asked to complete the survey. Thus, the survey is a volunteer, continuous, multi-country web-survey.[2] The web-survey takes approximately 10 minutes for part 1 and 10 minutes for part 2. The survey contains detailed questions, among others about education, occupation, skill mismatch, industry, country of birth, country of birth of mother and father, and in some countries ethnic group. The data from the web-survey are used for research and for the calculations underlying the Salary Check. The dataset is advantageous for our purpose because it has sufficient observations to distinguish detailed migrant groups. It is disadvantagous however, because by defintion web-survey will only be completed by individuals with sufficient good language skills to read the survey questions. This might particularly be determental for migrants. This will definitely lead to biassed data, though the problem is not as worse as it seems, because it can be assumed that firstly the literacy skills are higher among the employed migrants compared to the unemployed migrants and that secondly the size of the group of employed migrants with insuffient literacy skills is relatively small compared to the entire labour force.

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2   Note that also web-surveys based on panel invitations are volunteer surveys. Only a very few web-surveys, such as the LISS panel from Tilburg University, are randomly sampled using non-internet sampling frames. Note further that random sampled surveys may also be biased in case of substantial non-response, which nowadays in many surveys drops below 50%.

The *WageIndicator* web-survey includes several questions to identify minority groups. In the analyses country of birth has been used to identify the major migrant groups. In the web-survey, respondents are asked if they are born in the country of survey; if not, they can tick a country from a list of approximately 200 countries. In this paper we use the words "domestic workers" and "migrant workers" as to identify the two groups. The web-survey does not allow identification of return migration.

Though *WageIndicator* currently has websites and surveys established in almost all EU member states, some of them did not start until 2010, e.g. Autria and Ireland. In a few other countries, the question about skill mismatch is not asked, e.g. Germany. Therefore, the analyses were performed with data of 13 EU member states. In order to have sufficient observations to distinguish detailed migrant groups, we used the pooled annual data of the years 2005-20010. Note, however, that four of the 13 countries (the Czech Republic, France, Slovakia, and Sweden) only joined the web-survey in the course of 2008. Respondents with ages under 14 or over 70, unemployed, school pupils, students and those who never had a job were excluded, and so werethose with no valid values on the skill mismatch question and country of birth. Altogether 291,699 observations were included in the analysis. The large sample size allows a break-down of migrant groups according to country of birth in order to better capture the heterogeneity of migrants.

Although the survey is voluntarily completed, we do not use within-country weights. First, compared to the means of demographic variables known from other sources the sample variable means do not deviate to a large extent. For example, based on 180 studies Leuven and Oosterbeek (2010) found an average of 30% overeducation, of which the USA revealed the highest overeducation. Our dataset reveals 22% overeducation in the EU member states. The most underrepresented groups are found in small groups, for example workers with a part-time job of less than 10 hours per week. Weighting to correct for these groups hardly will affect the means of the variables under study. Second, and most important, weighting volunteer surveys to control for socio-demographic composition does not solve the small bias in wages, our targeted variable (Steinmetz *et al*, 2009). However, we do use country weights, using data from the European Labour Force Survey in the respective years, so that the sample reflects the relative sizes of the national labour forces.

3.2.   The model

Skill mismatch is the dependent variable in this paper. The *WageIndicator* survey includes a question "Do your qualifications match your job". The three response options are "Yes", "No, I am overqualified for my job", and "No, I am underqualified for my job". Thus, we will analyse workers' self-assessed skill mismatch.

We will use "correct match", "overeducation" and "undereducation" as to identify the three answer groups. The first model investigates if migrant workers, categorized in groups according to their country of birth, are more or less likely to be under- or overeducated.

In a second model skill mismatch is considered to be dependent on educational attainment and job levels. As for education, the web-survey asks: "What is the highest level of education you have attained (with certificate)?". For school pupils or students, the relevant question is: "At what stage of education are you at the moment?" Both questions use a predefined list of national educational categories. An instruction to the survey question says "If you went to school abroad, enter the equivalent level". Thus, the measurement of migrants' attained education might cause measurement errors, in case they have received their education in the country of origin and not in the host country. Unfortunately, this measurement error cannot be corrected. On behalf of international comparison the national educational categories have been recoded into the worldwide International Standard Classification of Education classification 1997, as designed by UNESCO.[3] The variable ranges from 1 (Primary level of education) to 6.1 (6A Second stage of tertiary education, leading to an advanced research qualification). For the analyses, ISCED specifications such as 2A or 2B have been recoded into 2. Note that *WageIndicator* web survey has an additional value 0, indicating no education. The dataset has seven values for the ISCED variable, ranging from 0 to 6.

We have already treated the difficulties related to measuring job levels in section 2. For this paper, four job level indicators have been explored, three of which are derived from the occupation variable. The dataset holds detailed information on occupation, extending ILO's ISCO-08 4-digit occupational classification by adding further digits to approximately 1,700 occupations (Tijdens, 2010). The first job level indicator is the ISCO-08 skill level, based on ILO's definition of the four ISCO-08 job levels ranging from 1=unskilled, reflecting ISCED 0-1, to 4=highly skilled, reflecting ISCED 5a and 6 (ILO, 2007). The reader should note that ILO's skill levels are not based on global empirical investigations. Moreover, based on wage studies the skill levels are considered poor proxies (Dumont, 2006). The second indicator is called "Corporate hierarchy" which is based on a mapping of the 1,700 occupations into six corporate hierarchical levels ranging from 0=helper to 6=CEO, developed by the first author. The third indicator is the well-known socio-economic status of jobs, based on the ISEI measure of Ganzeboom (2010). A fourth indicator, "hierarchy within occupation", is not based on ISCO-08, but on a self-assessed status within the occupation, ranging from 1=assistant/trainee to 3=supervisor/teamleader. After analysing these four variables (see the Appendix for mean scores across migrant groups), it turned out that the ISCO skill level and the ISCO socio-economic status

3   For details about ISCED, see www.unesco.org/education/information/nfsunesco/doc/isced_1997.htm

were closely related, and therefore the ISCO socio-economic status was not included in the analyses. The occupation variable had a non-neglectable number of missing values, and therefore we included a dummy variable indicating the missing cases for the skill level variable. For the missing values in the variable "corporate hierarchy" we added information from the variable on supervisory position. Thus, in our analyses three variables are used as proxies for job level. These analyses will be controlled for industry and firmsize.

In a third model, three general assumptions have been derived from the theoretical considerations in section 2.3, thu not distinguishing between migrant and domestic workers. Overeducation is expected to be applicable for:

1) workers who recently entered the labour market, here defined as 5 years or less work experience;

2) workers having poor bargaining power, here defined as workers who are workers on sick leave, housewives or retirees with a job on the side, workers with an unemployment spell, and trainees;

3) female workers;

In a fourth model, three assumptions with regard to migrants have been derived from the theoretical considerations in section 2.3. Overeducation is expected to be applicable for:

4) workers facing lack of transparency of credentials, here defined as migrant workers who have arrived at the host country at an adult age (age 21 or older) and thus having completed their education in a country with credentials that are most likely unknown to the employer;

5) workers facing employers' discriminatory behaviour, here defined as workers who were not born in the country of survey, workers who were born in the country of survey but whose parents were not born in the country of survey, and workers who are part of an ethnic minority group;

6) workers with lower language abilities, here defined as migrant workers born in a country with a native language or a lingua franca that does not match that of the host country.

In section 2.3 one assumption related to undereducation has been elaborated. The following workers are expected to be more often undereducated:

1) workers with higher abilities, here defined as workers in supervisory positions.

Logit analyses have been used to estimate the likelihood of being overqualified compared to having a correct match or being underqualified. Similar estimations have been made for underqualification compared to having a correct match or being overqualified. These analyses are controlled for some workplace and personal characteristics, namely the aggregate industry, the firm size and gender.

The analyses have been performed with data of 13 EU member states, nine countries of the so-called old EU15 member states, namely Belgium, Denmark, Finland, France, Italy, Netherlands, Spain, Sweden, and United Kingdom, and four new accession EU12 countries, namely the Czech Republic, Hungary, Poland, and Slovakia. The large sample size allows a clustering into two categories of domestic and nine categories of migrant workers (see Table 1). The two categories of domestic workers include workers in the nine EU15 countries and in the four EU12 countries. Four categories of migrant workers aim to capture migration within the European Union and include migrants living in the nine EU15 countries and born in EU15, living in the nine EU15 and born in EU12, living in the four EU12 and born in EU12 and living in the four EU12 and born in EU15. Five categories of migrant workers aim to capture migration from outside the European Union and currently living in either the nine EU15 or the four EU12 countries. This group includes migrants born in an European non-EU country (predominantly Russia and CIS countries), migrants born in USA, Canada or Australia, migrants born in Africa, migrants born in Latin America, and migrants born in Asia.

4. Empirical findings on skill mismatch

4.1. Descriptive analysis of skills mismatch

Table 1 shows that the share of migrant workers in the nine EU15 countries is much higher than in the four EU12 countries (14% versus 2%). In the nine EU15 countries, almost half of the largest migrant group comes from other countries within the EU15 countries (40% from all migrants in EU15), whereas the second largest migrant group originates from Latin America (18%). The substantial share of this second group is in part due to the migrants from Surinam and the Dutch Antilles in the Netherlands. In the four EU12 countries, the largest migrant group is born in other countries within the EU12 (52% from all migrants in EU12), followed by the group from European non-EU countries (31%).

Table 1   Distribution over native and immigrant groups and over immigrant groups only, break down by EU15 and EU12 (N_unweighted=291,699).

		Country of survey = EU15		Country of survey = EU12		N_ unweighted
1	EU15 domestic	85.57%				247516
2	EU15 migrant born in EU15	5.84%	40.49%			5719
3	EU15 migrant born in EU12	1.13%	7.80%			994
4	EU12 domestic			98.18%		26295
5	EU12 migrant born in EU12			0.94%	51.77%	665
5	EU12 migrant born in EU15			0.19%	10.22%	42
6	EU27 migrant born in non-EU Europe	1.11%	7.69%	0.57%	31.41%	799
7	EU27 migrant born in USA, Canada or Australia	0.77%	5.34%	0.03%	1.84%	627
8	EU27 migrant born in Africa	1.31%	9.04%	0.03%	1.61%	1888
9	EU27 migrant born in Latin America	2.66%	18.44%	0.02%	0.92%	4436
10	EU27 migrant born in Asia	1.62%	11.20%	0.04%	2.23%	2718
		100%	100%	100%	100%	291699

Source: WageIndicator data 2005-2010, selection 13 EU member states. The data are weighted across countries and years, using European Labour Force Survey data (weighting for 2010 data is based on 2009 ELFS data, because 2010 ELFS data was not yet available at the time of writing).

Using workers'skill match assesment, Table 2 shows that almost three of four respondents in the entire sample assess their job level and educational attainment to be a correct match (74%). The differences between the domestic and migrant workers are minor (74%, sd .44 versus 72%, sd .45). When detailing the incidence of a correct match for the various groups, table 2 reveals that migrants born in EU15 and working in EU12 report most frequently a correct match (89%), followed by the domestic workers in EU12 (87%).

In contrast, the migrant workers born in EU12 and working in EU15 and the migrant workers born in Asia report least frequently so (64% versus 65%).

One of five workers asseses to be overqualified (20%). When comparing the domestic and migrant workers, overqualification occurs less often among domestic workers than among migrant workers (19%, sd .39 versus 24%, sd .43). When detailing overqualification, the migrants from Asian origin and those from Latin American origin report most frequently to be overqualified (32% versus 27%). In contrast, the migrants born in EU15 and working in EU12, migrants born in non-EU Europe and domestic workers in EU12 report least frequently being overqualified (7%, 8% versus 11%). Overqualification is much more common in the labour markets of EU15 compared to EU12 (22% versus 11%), but in both areas migrants more often report to be overqualified than domestic workers.

One of twenty workers asseses to be underqualified (6%). Domestic workers report more frequently to be underqualified compared to migrants (7%, sd .25 versus 4%, sd .20). Underqualification occurs more often in EU15 compared to EU12 (7% versus 2%). In EU15, domestic workers report more often to be underqualified than migrant workers do, whereas a reversed pattern can be seen in EU12. The most frequent incidences of overqualifion are reported by domestic workers in EU15 and by migrants born in EU12 and working in EU15 report (9% respectively 7%). The EU12 born migrants in EU15 frequently report both to be underqualified and to be overqualified.

Table 2   Distribution over self-assesed skill mismatch (row percentages) for EU15+12 natives and migrant groups (N_unweighted=291,699).

Country of birth	Under qualified	Correct match	Over qualified	Total
EU15 domestic	8.0%	70.5%	21.5%	100%
EU15 migrant born in EU15	2.7%	73.7%	23.6%	100%
EU15 migrant born in EU12	7.4%	64.1%	28.5%	100%
EU12 domestic	2.2%	86.9%	10.9%	100%
EU12 migrant born in EU12	3.7%	70.9%	25.4%	100%
EU12 migrant born in EU15	4.5%	88.7%	6.8%	100%
EU27 migrant born in non-EU Europe	5.9%	85.8%	8.2%	100%
EU27 migrant born in USA, Canada or Australia	2.4%	80.9%	16.7%	100%
EU27 migrant born in Africa	5.8%	68.9%	25.2%	100%
EU27 migrant born in Latin America	6.2%	66.4%	27.4%	100%
EU27 migrant born in Asia	2.4%	65.5%	32.1%	100%
Total	6.5%	73.7%	19.8%	100%
Belgium - Domestic worker	12.0%	72.4%	15.6%	100%
Belgium - Migrant worker	8.9%	67.5%	23.6%	100%
Denmark - Domestic worker	3.3%	77.8%	18.9%	100%
Denmark - Migrant worker	1.0%	54.3%	44.6%	100%
Finland - Domestic worker	5.1%	68.6%	26.3%	100%
Finland - Migrant worker	3.4%	69.7%	26.9%	100%
France - Domestic worker	6.0%	80.8%	13.2%	100%
France - Migrant worker	2.1%	75.6%	22.3%	100%
Italy - Domestic worker	12.3%	68.1%	19.5%	100%
Italy - Migrant worker	5.4%	77.5%	17.1%	100%
Netherlands - Domestic worker	13.1%	68.9%	18.1%	100%
Netherlands - Migrant worker	10.3%	63.6%	26.1%	100%
Spain - Domestic worker	5.3%	64.0%	30.7%	100%
Spain - Migrant worker	4.6%	65.3%	30.1%	100%
Sweden - Domestic worker	3.1%	76.2%	20.7%	100%
Sweden - Migrant worker	3.9%	72.8%	23.3%	100%
United Kingdom - Domestic worker	6.5%	72.5%	21.0%	100%
United Kingdom - Migrant worker	4.0%	71.4%	24.6%	100%
Total - EU 15 - Domestic worker	8.0%	70.5%	21.4%	100%
Total - EU 15 - Migrant worker	4.2%	71.5%	24.3%	100%
Total - EU15	7.5%	70.7%	21.9%	100%
Czech Republic - Domestic worker	7.4%	67.5%	25.1%	100%
Czech Republic - Migrant worker	4.6%	68.0%	27.5%	100%
Hungary - Domestic worker	3.2%	73.2%	23.6%	100%
Hungary - Migrant worker	5.9%	69.2%	24.9%	100%
Poland - Domestic worker	1.1%	94.2%	4.7%	100%
Poland - Migrant worker	3.0%	94.8%	2.2%	100%
Slovakia - Domestic worker	5.2%	61.2%	33.6%	100%
Slovakia - Migrant worker		58.9%	41.1%	100%
Total - EU 12 - Domestic worker	2.2%	86.9%	10.9%	100%
Total - EU 12 - Migrant worker	4.2%	77.7%	18.2%	100%
Total - EU12	2.2%	86.8%	11.0%	100%
Total - Domestic worker	6.8%	73.9%	19.2%	100%
Total - Migrant worker	4.2%	71.7%	24.1%	100%
Total	6.5%	73.7%	19.8%	100%

Source: WageIndicator data 2005-2010, selection 13 EU member states. The data are weighted across countries and years, using European Labour Force Survey data (weighting for 2010 data is based on 2009 ELFS data, because 2010 ELFS data was not yet available at the time of writing).

Table 3 presents the means for all variables in the model, broken down for the three skill match categories. All variables reveal a significant difference across the three skill match categories. Not surprisingly, the mean educational attainment for the underqualified workers is lowest and for the overqualified workers highest, whereas the mean job levels are highest for the workers with a correct match and lowest for the overqualified workers. The overqualified workers are most frequently female, have the most frequently fewer than 5 years of experience, the most frequently poor bargaining power, and the least frequently a supervisory position. The correct matched workers have on average the highest socio-economic status.

Table 3   Descriptive Statistics (Means) over the three skill match categories for all variables in the model (N_unweighted=291,699)

Descriptive Statistics	Total	Under qualified	Correct match	Over qualified	Sign Chisq
EU15 domestic (0, 1)	69.6%	85.8%	66.6%	75.2%	***
EU15 migrant born in EU15 (0, 1)	4.8%	2.0%	4.8%	5.7%	***
EU15 migrant born in EU12 (0, 1)	0.9%	1.0%	0.8%	1.3%	***
EU12 domestic (0, 1)	18.2%	6.2%	21.5%	10.0%	***
EU12 migrant born in EU12 (0, 1)	0.2%	0.1%	0.2%	0.2%	***
EU12 migrant born in EU15 (0, 1)	0.0%	0.0%	0.0%	0.0%	***
EU27 migrant born in non-EU Europe (0, 1)	1.0%	0.9%	1.2%	0.4%	***
EU27 migrant born in USA, Can., Aus. (0, 1)	0.6%	0.2%	0.7%	0.5%	***
EU27 migrant born in Africa (0, 1)	1.1%	1.0%	1.0%	1.4%	***
EU27 migrant born in Latin America (0, 1)	2.2%	2.1%	2.0%	3.0%	***
EU27 migrant born in Asia (0, 1)	1.3%	0.5%	1.2%	2.1%	***
ISCED educational level (0-7)	4.16	3.55	4.19	4.28	***
Corporate hierarchy (1=helper; .. ; 6=CEO)	28.9%	45.9%	33.2%	7.4%	***
Socio-economic status (10-89)	52.07	50.76	53.46	47.29	***
Firm size 1 – 10 (0, 1)	22.4%	19.5%	21.4%	26.7%	***
Firm size 10 - 50 (0, 1)	26.6%	30.9%	26.3%	26.7%	***
Firm size 50-100 (0, 1)	12.0%	10.7%	12.6%	10.5%	***
Firm size 100-500 (0, 1)	19.5%	18.7%	19.7%	19.2%	***
Firm size 500 and over (0, 1)	19.4%	20.2%	20.1%	16.9%	***
Industry - Agricul, manufact, constr (0, 1)	27.3%	26.4%	27.7%	25.9%	***
Industry - Trade, transport, hospitality (0, 1)	31.9%	36.5%	31.1%	33.4%	***
Industry - Commercial services (0, 1)	19.8%	17.6%	20.3%	18.5%	***
Industry - Public sector, health care, edu. (0, 1)	21.0%	19.5%	20.8%	22.2%	***
Female (0, 1)	45.1%	40.9%	44.5%	48.6%	***
Work experience <= 5 year (0, 1)	26.3%	17.7%	26.6%	27.9%	***
Poor bargaining power (0, 1)	9.7%	6.7%	9.8%	10.0%	***
Supervisory position (0, 1)	36.5%	39.8%	38.3%	29.1%	***
Good promotion prospects (0, 1)	44.2%	53.5%	44.1%	41.3%	***
Migrant speaking domestic language (0, 1)	91.3%	93.9%	91.5%	89.5%	***
Migrant incl 2nd gen. and ethnic group (0, 1)	13.6%	11.5%	13.3%	15.2%	***
Migrant arrived as adult (0, 1)	7.1%	3.9%	7.1%	8.4%	***

Source: WageIndicator data 2005-2010, selection 13 EU member states. The data are weighted across countries and years, using European Labour Force Survey data (weighting for 2010 data is based on 2009 ELFS data, because 2010 ELFS data was not yet available at the time of writing).

4.2.   Does overeducation occurs more often among migrant workers?

Our first research objective is to investigate whether migrants are more often overqualified compared to domestic workers. Table 4 confirms indeed that overeducation occurs more often among migrant workers. Based on model 1a in the table the conclusion is justified that the odds ratio of being overqualified increases with a factor 1.47 for migrants compared to domestic workers. Yet, the table also reveals that the odds ration for a worker to be overqualified increases substantially when working in the EU15 compared to EU12. Thus, both the characteristics of migrants and those of national labour markets influence the incidence of overeducation. In model 1b the heterogeneity of the migrant groups is taking into account. The model reveals indeed large differences across these groups. Of all migrant and domestic groups, the odds ratio of being overqualified is highest for migrants working in EU15 and born in EU12. In the model the latter is the reference group. In contrast, the odds ratio decreases most for the migrants from USA, Canada and Australia, inmediately followed by the domestic workers in EU12. These findings underline that generalizations about migrants drawn in model 1a indeed need to be specified for various migrant groups.

Table 4   Chance of overeducation compared to a correct skill match or undereducation (logistic regression: odds ratio, significance levels and standard errors in brackets)

	Model 1a Exp(B)	S.E.	Model 1b Exp(B)	S.E.	Model 2 Exp(B)	S.E.	Model 3 Exp(B)	S.E.	Model 4 Exp(B)	S.E.
Migrant(0,1)	1.545 ***	(0.02)								
Working in EU15 (0,1)	1.284 ***	(0.02)								
EU15 domestic			0.384 ***	(0.08)	0.453 ***	(0.08)	0.476 ***	(0.08)		
EU15 migrant born in EU15			0.493 ***	(0.09)	0.553 ***	(0.09)	0.572 ***	(0.09)		
EU12 domestic			0.298 ***	(0.08)	0.333 ***	(0.09)	0.346 ***	(0.09)		
EU12 migrant born in EU12			0.533 ***	(0.13)	0.615 ***	(0.13)	0.651 **	(0.13)		
EU27 migrant born in non-EU Europe			0.816	(0.12)	0.825	(0.13)	0.837	(0.13)		
EU27 migrant born in USA, Can, Aus.			0.297 ***	(0.15)	0.353 ***	(0.16)	0.364 ***	(0.16)		
EU27 migrant born in Africa			0.653 ***	(0.10)	0.702 ***	(0.11)	0.732 **	(0.11)		
EU27 migrant born in Latin America			0.648 ***	(0.09)	0.708 ***	(0.09)	0.735 ***	(0.09)		
EU15 migrant born in Asia			0.535 ***	(0.10)	0.592 ***	(0.10)	0.615 ***	(0.10)		
Educational level (ISCED 0=no edu,.., 7=tert. edu)					1.498 ***	(0.00)	1.482 ***	(0.00)	1.471 ***	(0.00)
Hierarchy within occupat. (1=trainee,.., 3=su-perv)					0.708 ***	(0.01)	0.743 ***	(0.01)	0.740 ***	(0.01)
Corporate hierarchy (1=help,..,6=CEO)					0.839 ***	(0.01)	0.847 ***	(0.01)	0.843 ***	(0.01)
Occupation semi-skilled					0.522 ***	(0.03)	0.517 ***	(0.03)	0.515 ***	(0.03)
Occupation skilled					0.252 ***	(0.03)	0.254 ***	(0.03)	0.253 ***	(0.03)
Occupation highly skilled					0.147 ***	(0.03)	0.148 ***	(0.03)	0.147 ***	(0.03)
Occupation skill level missing					0.304 ***	(0.03)	0.305 ***	(0.03)	0.314 ***	(0.03)
Firm size 1 – 10					1.114 ***	(0.02)	1.088 ***	(0.02)	1.088 ***	(0.02)
Firm size 10 - 50					1.036	(0.02)	1.027	(0.02)	1.028	(0.02)
Firm size 100-500					0.929 ***	(0.02)	0.937 ***	(0.02)	0.936 ***	(0.02)
Firm size 500 and over					0.809 ***	(0.02)	0.826 ***	(0.02)	0.830 ***	(0.02)
Industry - Agricult, manufact, constr					0.847 ***	(0.01)	0.910 ***	(0.01)	0.907 ***	(0.01)
Industry - Trade, transport, hospitality					1.213 ***	(0.01)	1.259 ***	(0.01)	1.253 ***	(0.01)
Industry - Commercial services					0.755 ***	(0.02)	0.768 ***	(0.02)	0.767 ***	(0.02)
Industry - Missing value					0.942	(0.03)	0.989	(0.03)	0.963	(0.03)
Recent labour market entrant (0,1)							1.202 ***	(0.01)	1.192 ***	(0.01)
Poor bargaining power (0,1)							1.190 ***	(0.02)	1.192 ***	(0.02)
Female (0,1)							1.216 ***	(0.01)	1.213 ***	(0.01)
Lack of transparent credentials (0,1)									1.509 ***	(0.04)
Speaks native language (0,1)									0.955	(0.03)
Migrant 1st/2nd gen. or ethnic minority (0,1)									1.174 ***	(0.02)
Constant			0.639 ***	(0.08)	0.357 ***	(0.09)	0.262 ***	(0.09)	0.136 ***	(0.05)
-2 Log likelihood	268716.8		268598.6		252339.3		251640.2		251843.0	
Nagelkerke R Square	0.00		0.00		0.10		0.10		0.10	
Chi-square (df) sign	611.46 (2) ***		729.72 (9) ***		16989.01 (24) ***		17688.16 (27) ***		17485.27 (21) ***	

Source: *WageIndicator data 2005-2010, selection 13 EU member states. N = 271,372. *** p<0.001, ** p<0.005; * p<0.010*

NOTE: *Reference groups are EU15 migrant born EU12, ocupation unskilled, firm size 50-100, industry Public sector, health care, education*

NOTE: *The group EU15 migrants born EU12 is removed from the model because of too few observations.*

4.3.   Is overeducation related to labour market characteristics?

The second research objective aims to investigate if overeducation is related to national labour market characteristics, assuming that skill mismatch varies among workers' educational attainment and their job levels. Model 2 in Table 4 reveals indeed, not surprisingly, that the odds ratio of being overqualified increases with educational attainment. Overeducation is also related to job levels. We used three proxies to measure the workers' job level. Regarding the first proxy, the table revels that the odds ratio of being overqualified decreases with the hierarchical level within an occupation. The second proxy investigates the effect of the corporate hierarchy across occupations. The odds ratio of being overqualified decreases for each level in the hierarchy. Regarding the third proxy, the skill level of the workers' occupation, the table reveals that the odds ratio of being overqualified decreases for the workers in semi-skilled occupations compared to those in unskilled occupations. It decreases even more for workers in the highly skilled occupations. In summary and not surprisingly, the higher the individual's education, the more overeducation can be expected and the higher the individual's job level, the less overeducation can be expected.

The analyses in table 4 model 2 have been controlled for other labour market characteristics. The findings show that the odds ratio of being overqualified increases for small firms up to 10 employees compared to middle-sized firms with 50-100 employees and that the odds ration decreases for large firms compared to middle-sized firms. The findings reveal further that compared to the public sector, the odds ratio of being overqualified is higher in trade, transport and hospitality, but lower in all other industries.

4.4.   Is overeducation related to vulnerability of workers?

The third research objective aims to investigate whether a range of theoretically based assumptions affect the incidence of overeducation. In section 3.2 based on theoretical considerations we derived three assumptions relating overeducation to recent labour market entry and to poor bargaining power. The results in model 3 in table 4 indeed confirm these assumptions. For recent labour market entrants, defined as those with less than 5 years of service, the odds ratio of being overqualified increases with 20% compared to workers with more years of service. Note that in case of migrants these years of service include years of service, if any, in the country of birth. For workers with poor bargaining power, here defined as workers with a job on the side, trainess and workers with an employment spell, the odds ratio of being overqualified

increases with 19% compared to workers with more power. Finally, for female workers the odds ratio of being overqualified increases with 22% compared to male workers.

4.5. Is overeducation related to characteristics of migrants?

The fourth research objective aims to investigate whether a range of theoretically based assumptions related to migrants affect the incidence of overeducation. Model 4 in Table 4 presents the findings. Note that in this model the break down into several migrant and domestic groups is not included, because here migrants are broken down into groups related to the characteristics under study.

In section 3.2 it was assumed that workers facing lack of transparency of credentials were more likely to be overqualified. Here, this group is defined as migrant workers who have arrived at the host country at an adult age (21 years). This group most likely will have taken their education in the country of birth, thus challenging the transparency of credetials in the host country. This assumption is supported. The odds ratio of being overqualified increases with 51% for migrants who arrived at an adult age compared to workers, both migrants and domestics, who received their credentials in the country they are currently living.

In section 3.2 it was also hypothesized that workers facing employers' discriminatory behaviour are more likely to report overeducation. This group is defined as workers who were not born in the country of survey, workers who were born in the country of survey but whose parents were not born in the country of survey, and workers who are part of an ethnic minority group. Thus it is assumed that the 1st and 2nd generation migrants and the ethnic minorities are similarly due to labour market discrimination and that this in turn increases the likelihood of overqualification. From table 4 model 4 it turns out that indeed this is the case. The odds ratio of being overqualified increases with 17% for 1st and 2nd generation migrants and ethnic minorities compared to domestic workers.

In section 3.2 it was finally hypothesized that migrants workers with lower language abilities, here defined as migrant workers born in a country with a native language or a lingua franca that does not match that of the host country, are more likely to report overeducation. This assumption is not supported by our results.

4.6. Does undereducation relates to higher abilities, here defined as workers in supervisory positions?

Our last research objective is to investigate whether migrants are less often underqualified compared to domestic workers. Table 5 confirms that the odds ratio for migrants to be underqualified decreases compared to domestic workers. Undereducation occurs more often in the EU15 compared to EU12, as the odds ratio for undereducation increases for EU15. Model 1b reveals that the odds ratio for undereducation increases for the EU15 domestic workers compared to the reference group of EU15 migrants from EU12. For the remaining domestic and migrant groups no significant results have been found. Model 2 in tabel 5 reveals not surprisingly that the odds ratio for being underqualified increases for lower educational levels and increases for higher hierarchies within the occupation, for higher corporate hierarchical levels, and for higher job levels. The odds ratio for being underqualified increases with firmsize, and is higher in all industries compared to the public sector. For workers who recently entered the labour market, for workers with poor bargaining power and for female workers the odds ratio for underqualification decreases, as model 3 shows. Model 4 finally reveals that the odds ratio for being underqualified decreases for migrant workers who arrived at an adult age in the host country, and increases for migrants both the 1st and 2nd generation. Having a supervisory position leads to an increase in the odds ratio of being underqualified. This suggest that underqualified workers with higher capabilities provide internal career ladders.

Table 5 Chance of undereducation compared to a correct skill match or overeducation (logistic regression: odds ratio, significance levels and standard errors in brackets)

	Model 1a		Model 1b		Model 2		Model 3		Model 4	
	Exp(B)	S.E.	Exp(B)	S.E.	Exp(B)	S.E.	Exp(B)	S.E.	Exp(B)	S.E.
Migrant(0,1)	.755 ***	(0.03)								
Working in EU15 (0,1)	2.656 ***	(0.03)								
EU15 domestic			1.996 ***	(.159)	1.559 *	(.165)	1.497	(.165)		
EU15 migrant born EU15			1.681 **	(.169)	1.475	(.175)	1.422	(.175)		
EU12 domestic			.736	(.162)	.751	(.168)	.730	(.168)		
EU12 migrant born EU12			1.124	(.237)	1.209	(.243)	1.171	(.244)		
EU27 migrant born non-EU Europe			1.480	(.227)	1.538	(.235)	1.522	(.235)		
EU27 migrant born USA, Can, Aus.			1.555	(.232)	1.405	(.240)	1.354	(.241)		
EU27 migrant born Africa			1.388	(.189)	1.255	(.195)	1.228	(.195)		
EU27 migrant born Latin America			1.270	(.173)	1.060	(.179)	1.027	(.179)		
EU15 migrant born Asia			1.639 *	(.178)	1.449	(.185)	1.419	(.185)		
Educational level (ISCED 0=no edu,.., 7=tert. edu)					.455 ***	(.006)	.461 ***	(.006)	.454 ***	(.007)
Hierarchy within occupat. (1=trainee,.., 3=superv)					1.338 ***	(.010)	1.289 ***	(.010)	1.080 ***	(.012)
Corporate hierarchy (1=help,..,6=CEO)					1.152 ***	(.009)	1.145 ***	(.009)	1.044 ***	(.009)
Occupation semi-skilled					1.568 ***	(.046)	1.554 ***	(.046)	1.550 ***	(.046)
Occupation skilled					3.218 ***	(.047)	3.174 ***	(.048)	3.178 ***	(.048)
Occupation highly skilled					3.771 ***	(.049)	3.726 ***	(.049)	3.632 ***	(.049)
Occupation missing					2.769 ***	(.046)	2.741 ***	(.046)	2.836 ***	(.047)
Firm size 1 – 10					.805 ***	(.023)	.822 ***	(.024)	.819 ***	(.024)
Firm size 10 - 50					.922 ***	(.022)	.929 ***	(.022)	.925 ***	(.022)
Firm size 100-500					1.082 ***	(.023)	1.075 **	(.023)	1.086 ***	(.023)
Firm size 500 and over					1.153 ***	(.024)	1.136 ***	(.024)	1.156 ***	(.024)
Industry - Agricult, manufact, constr					1.177 ***	(.019)	1.138 ***	(.020)	1.114 ***	(.020)
Industry - Trade, transport, hospitality					1.236 ***	(.019)	1.224 ***	(.019)	1.183 ***	(.019)
Industry - Commercial services					1.429 ***	(.022)	1.426 ***	(.022)	1.417 ***	(.022)
Industry - Missing value					1.414 ***	(.033)	1.382 ***	(.033)	1.306 ***	(.033)
Recent labour market entrant (0,1)							.743 ***	(.020)	.738 ***	(.020)
Poor bargaining power (0,1)							.929 ***	(.020)	.956 *	(.021)
Female (0,1)							.923 ***	(.014)	.933 ***	(.015)
Lack of transparent credentials (0,1)									.563 ***	(.066)
Speaks native language (0,1)									1.132 *	(.050)
Migrant 1st/2nd gen. or ethnic minority (0,1)									1.227 ***	(.024)
Supervisory position (0,1)									1.695 ***	(.017)
Constant	.049		.066 ***	(.159)	.153 ***	(.173)	.187 ***	(.174)	.358 ***	(.076)
-2 Log likelihood	185073.24		185035.51		164657		164375.81		########	
Nagelkerke R Square	.010		0.01		0.155		0.157		.161	
Chi-square (df) sign	1397.58(2)		1435.31 (9) ***		21814.25 (24) ***		22095.01 (27) ***		22122.69 (22) ***	

Source: WageIndicator data 2005-2010, selection 13 EU member states. N = 271,372 (N=265,220 for model 4). *** p<0,001, ** p<0,005; * p<0,010

NOTE: Reference groups are EU15 migrant born EU12, occupation unskilled, firm size 50-100, industry Public sector, health care, education

NOTE: The group EU15 migrants born EU12 is removed from the model because of too few observations.

5.   Conclusion and discussion

Is skill mismatch more common for migrants compared to domestic workers? And if so, is the incidence similar across migrant workers from the 'old' EU15 member states and the 'new' EU12 member states, and across domestic workers from the EU15 and the EU12? This paper uses survey data, whereby workers themselves assess if they are qualified, overqualified or underqualified for their job. The data stems from the multi-country, continuous WageIndicator web-survey, using pooled annual data for the years 2005-2010 from nine EU15 countries (Belgium, Denmark, Finland, France, Italy, the Netherlands, Spain, Sweden, and the United Kingdom) and four EU12 countries (Czech Republic, Hungary, Poland, and Slovakia). In this paper, migrants have been defined as not born in the country of survey.

The share of migrant workers in the nine EU15 countries is much higher than in the four EU12 countries (14% versus 2%). The data show that 18% of the migrants in EU12 are overqualified compared to 24% of the migrants in EU15. Overeducation as well as undereducation are much more common in the EU15 than in the EU12 (25% respectively 9% for overeducation and 7% respectively 2% for undereducation). Overeducation occurs more often for migrants compared to domestic workers, and it occurs more often in the EU15 compared to EU12. Thus, both the characteristics of migrants and those of national labour markets influence the incidence of overeducation.

A few theoretically based assumptions aim to explain overeducation from educational attainments and job levels. The analyses show, not surprisingly, that the higher the individual's education, the more overeducation can be expected and the higher the individual's job level, the less overeducation can be expected. Controls for firm size and industry reveal that overeducation occurs more often in small firms compared to large firms and more often in trade, transport and hospitality compared to the public sector. Recent labour market entrants, workers with a job on the side, and female workers are more likely to be overqualified.

A few theoretically based assumptions aim to explain why migrants are more prone to be overqualified. A lack of transparency of credentials are assumed to increase the incidence of overeducation. This phenomenon is defined as migrant workers who have arrived at the host country at an adult age, and they face indeed a higher chance of overeduction. Employers' discriminatory behaviour is assumed to increase the incidence of overeducation. Indeed, the 1st and 2nd generation migrants and the ethnic minorities are due to labour market discrimination and this in turn increases the likelihood of overqualification. Finally it is hypothesized that migrants workers with lower language abilities, here defined as migrant workers born in

a country with a native language or a lingua franca that does not match that of the host country, are more likely to report overeducation. This assumption is not supported by our results. Finally, the chance of being underqualified does not point to differences across domestic and migrant workers, but the analysis provide support for the hypothesis that underqualified workers with higher capabilities provide internal career ladders.

This study in part confirms the existing literature, in particular the job allocation frictions for the entire labour market. It expands existing empirical findings with regard to the reasons why migrants are more likely to be overeducted. In addition, our analysis details the migrant groups into seven groups previously not studied. This paper challenges further investigations on the incidence of overeducation in general, because the fit of the models is not particularly high. It also asks for further theoretical underpinnings of undereducation. It challenges to undertake further research on the cross-national differences with regard to over- and undereducation, in particular the differences between the EU15 and the EU12 countries.

Our analyses have also shortcomings. First, we were not able to test the impact of labour market conditions, in particular the impact of labour shortages, due to absence of relevant data. Second, we were not able to control for the skill composition of the annual stock of immigrants as a result of a country's immigration policies, again due to absence of data. Third, our analyses might be subject to measurement errors regarding the educational attainment of migrants who have arrived the host country at an adult age, because this groups should be asked for their education in the home country and for not its equivalent in the host country, as is the case in our data.

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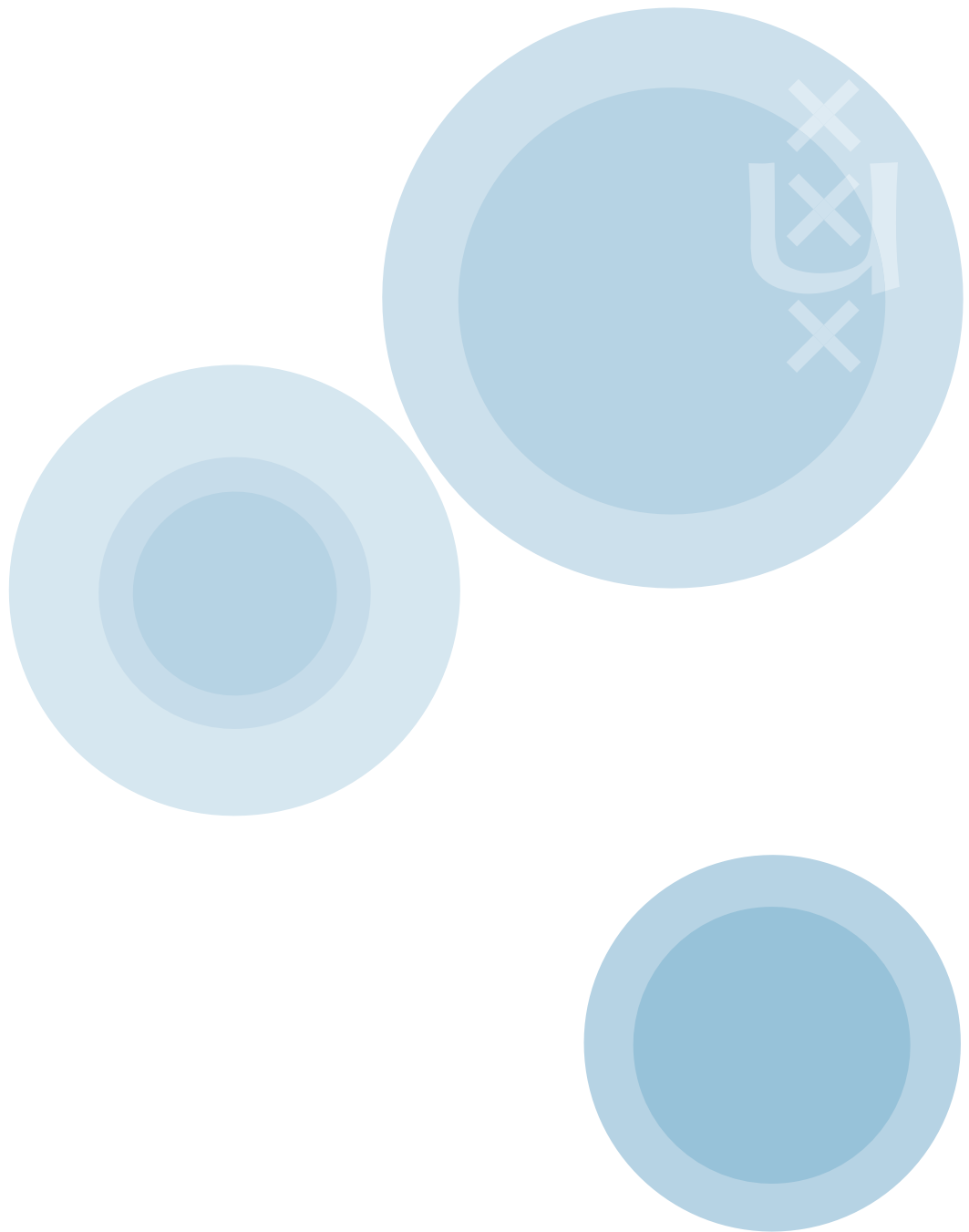2000 - Jelle Visser

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