**Immigrants’ educational mismatch and the penalty**

**of overeducation**

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**Abstract**

This paper analyses immigrants’ educational mismatch and its impact on wages in Spain. The incidence of immigrants’ education-occupation mismatch in the Spanish labour market can largely be explained by the mismatch in the last job held in the home country. The probability of having been over-educated in the home country has a higher effect on the probability of being over-educated in the first job in Spain. Those who were over-educated in their first job are more likely to continue being over-educated in their current job in Spain. Finally, overeducated immigrants earn significantly lower wages compared to their non-overeducated counterparts.

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**Keywords:** Immigration, Education-occupation mismatch, Sample selection

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**1. Introduction**

A job mismatch typically occurs if an individual is employed in an occupation which requires a lower or higher level of education than the one formally obtained. For instance, if a worker has formal qualifications above (below) the level required for the job then he is considered to be overeducated (under-educated). Within the education-occupation mismatch literature, a line of research has consistently found that immigrants are significantly more overeducated than comparable natives. While most of the existing studies argue that imperfect transferability of human capital and/or discrimination are the main explanations for the relatively higher incidence of immigrants’ mismatch, little attention has been paid to the role a mismatch in the home country plays in the host country labour market.[[1]](#footnote-1) This paper contributes to the literature by analysing the role of previous, home country mismatch, on both the incidence of mismatch and the associated wage penalty in Spain.

Chiswick and Miller (2010) argue that over time the incidence of overeducation declines as immigrants tend to adjust to the requirements of the host country’s job market, gain relevant work experience and are therefore more likely to obtain jobs that match their educational qualifications. Piracha *et al* (2012), using Australian data, explicitly focus on the role of home country labour market experience and argue that besides imperfect transferability of human capital and/or discrimination, the incidence of a previous job mismatch in the country of origin plays a significant role in the determination of a mismatch in the host country.[[2]](#footnote-2)

We build our analysis upon Piracha *et al* (2012) to give new evidence on the role of home country labour market experience, focusing on the signal host country employers receive from a previous mismatched work experience. In addition, and unlike Piracha *et al* (2012), we also analyse the impact of overeducation on immigrants’ wages, using a standard log wage equation in which over-educated immigrants are compared to the non-overeducated individuals.

Data from the National Immigrant Survey of Spain 2007 is used which contains detailed information about immigrants’ education as well as their occupation level and the sectors they work in, for three different stages/periods: last job held in the home country as well as first and the current jobs in Spain.[[3]](#footnote-3) Using probit with selection, the results show that 40 per cent of overeducation incidence in the first job in the host country for male immigrants can be explained by the corresponding incidence of mismatch in the home country.[[4]](#footnote-4) The incidence of overeducation increases substantially when considering the mismatch from the previous to the current job in Spain, showing that domestic signal of worker quality plays an even stronger role than the one from the home country job. In addition, the results reveal that overeducated earn substantially lower wages compared to their non-overeducated counterparts. A significant wage loss in the current job is also observed for those who have been previously mismatched in both, home country and first job in Spain. However, having been overeducated in the first job in Spain has a higher impact on wages than those overeducated in the home country. Finally, the results reveal higher penalties for relatively higher educated immigrants compared to those with a lower education level.

The rest of the paper is organised as follows. Section 2 discusses theoretical and empirical background on the incidence of over-education including its effects on wages while Section 3 presents the data and construction of variables. Section 4 provides the empirical methodology and Section 5 discusses the results. Last section concludes.

**2. Theory and evidence**

Education-occupation mismatch is a dynamic process that is theorised to be affected by the individual’s experience in the labour market. For instance, search-and-match theory (Groot and Maassen van den Brink 2000; Hartog 2000) supports that a mismatch arises from imperfect information about a host country’s labour market, whereas the human capital theory suggests that experience gained through on-the-job training could, in many cases, be a substitute to formal schooling (Sicherman 1991). Nevertheless, both theories support that the process of over-education is affected by experience acquired over time and predict a negative relationship between host country labour market experience and over-education.

The theories are supported by Chiswick and Miller (2009) who found that time spent in the US and experience acquired about the host country’s labour market tend to help immigrants in finding a better matched job over time. They found that the probability of being over-educated decreases after 30 years of residency, while the probability of under-education increases. However, surplus years of schooling appear to have relatively very little effect on earnings (Chiswick and Miller, 2010). Dolton and Silles (2008) distinguished between over-education in the first and current job and found that individuals’ earnings are reduced by 33-41 percent in their first job and 66-68 percent in the current job. McGuiness and Sloane (2011) studied labour market mismatches among UK graduates and found that 30 percent of workers who were over-educated in their initial employment were still overeducated even 5 years after graduation.[[5]](#footnote-5) In addition, Mavromaras and McGuinness (2012) used a dynamic random effect probit model to estimate the dynamics of overskilling distinguishing among different education levels and found that workers with a relatively higher education level experience the highest state dependence. Finally, Chevalier and Lindley (2009) take a slightly different approach and distinguish between *apparently* and *genuinely* overeducated graduates (less skill graduates who felt that their qualifications were ideal for their job and those who felt their qualifications were very inappropriate) and found that apparently overeducated earn 7 percent lower wages compared to matched graduates, while the pay penalty for genuinely over-educated workers is 33 percent.

However, limited attention has been paid to the labour market experience gained in the home country in explaining over-education in the host country. Chiswick and Miller (2009) is one of the few studies who considered this effect. Using data for the US, their results show that home country labour market experience does not improve job matches in the US. Piracha *et al* (2012) is the only paper that explicitly focuses on the role of home country labour market experience taking into consideration possible previous job mismatches in the home country. Using data from Australia, they analyse the effect of home country labour market experience on the education-occupation mismatch in the host country and show that a significant proportion of the incidence of over-/under-education in the host country can be explained by having been over-/under-educated prior to immigration. They argue that the incidence of a mismatch is determined by the actual signal of ‘real’ productivity from a previous mismatched work experience. However, they do not analyse the effect of the previous mismatch on current wages.

There are three main approaches typically used in the literature to measure the incidence of a mismatch. The first approach is the worker self-assessment which is based on survey data, where individuals are asked about the minimum educational qualification required for their job.[[6]](#footnote-6) The second approach is the realized matches method, which was first developed by Verdugo and Verdugo (1989) where over-education is measured using mean levels of required education for a particular job. The third approach used in the literature is the job analysis method which is considered to be an objective measure as it is based on documents and formal studies used by countries and labour organisations (Rumberger 1987 and Green *et al*. 2007). We use the job analysis method, which will be explained in more detail in the following section.

**3. Data and construction of variables**

We use data from the National Immigrant Survey of Spain (NIS 2007), which was conducted between November 2006 and February 2007 and covered a total of 15,465 individuals, one per household. All those who are foreign-born, living in Spain and at the time of survey were 16 years of age or older were interviewed. Among a set of socio-demographic and socio-economic individual characteristics, the survey contains information about immigrants’ employment status prior to arrival in Spain (last job held in the home country) as well as about their current job in Spain (job held at survey date) and their first job in Spain (if the job at survey date was not their first job). This enables us to capture the education-occupation mismatch of immigrants in three different time periods.

Figure 1 illustrates the sequence in which questions about individuals’ employment status were asked in the survey. Those employed were asked about details of their occupation and the sector of activity. All those who reported that it was their first job since their arrival are deemed to have no previous work experience in Spain, i.e., their current job is their first job. Those who responded that this was not their first job in Spain were also asked about their occupation status in their first job. The ones who reported that they are not currently employed (unemployed job seekers) were asked about whether they have previously worked in Spain. The previously employed were then asked to provide detailed information about their first employment after arrival. Those who responded that they have not previously worked (nor currently working) are the ones who have been unemployed throughout their stay in Spain and are still looking for employment. Indeed, all those who are not part of the labour force as well as those who state that they had Spanish nationality since birth are excluded. The analysis has been restricted to 2,933 male immigrants.

Immigrants’ wages are defined as the net monthly income in euros from the main job, including the monthly proportional part corresponding to ‘extraordinary pay checks’ and other ‘extraordinary income’ regularly received.[[7]](#footnote-7) Since 14 percent of employed males did not state the exact amount of their wages, they were given the option to state their approximate amount with given wage intervals. Midpoints have therefore been calculated for each of the given intervals provided in the questionnaire in order to estimate wages for this group. Since the survey does not provide information regarding immigrants’ employment contract (e.g. full-time or part-time work), hourly wages have been calculated by dividing monthly wages by 4 to get weekly wages and then divided by hours worked per week. It is important to note that the analysis on earnings is restricted to the effects of current and previous mismatch (first job in Spain and last job in the home country) on current wages only as we do not have information on immigrants’ wages in their home country or in the first job in Spain. Furthermore, in order to reduce selection bias that may arise from a cross sectional survey, the sample has been restricted to immigrants who arrived in Spain between 1997 and 2007.[[8]](#footnote-8)

One problem with the cross section data is that all the information captured could be contemporaneous, which in this case is a cause for concern as we don’t know, for instance, if the individual was married before their first job in Spain or not. In order to address this problem, approximate ‘lagged’ variables have been estimated which reflect the period in which immigrants were employed in their first job in Spain. The new ‘lagged’ variables created are marital status, obtained Spanish nationality after arrival, renting a dwelling, house payments pending as well as regional controls. Since the survey provides information on the year of arrival as well as the length of the period the individual remained unemployed, the year the immigrant found his first job was estimated according to the year of arrival in Spain. Thus, this information is used to create ‘lagged’ values of marital status and Spanish nationality by the time employed in the first job. In order to capture immigrants’ region of residence in Spain as well as their renting and house payments, ‘lagged’ variables were created for those who have changed residence since their arrival in the country.[[9]](#footnote-9) In addition, the first residence in Spain has been assumed to be closely linked to the first job obtained.[[10]](#footnote-10)

Table 1 provides the descriptive statistics. At the time of arrival, male immigrants were generally young and were therefore at an economically active age. Around 40 percent have dependent children in the household. They have furthermore spent an average of 6 years in Spain (the average year of arrival is 2001). Looking at the educational qualifications, it’s clear that more than half of males have only finished secondary education, while just about 16 percent report to have a higher education degree ̶ first and second stage tertiary education. In addition, immigrants earn an average of 7 euros/hour (1.86 log points). Finally, 28 per cent are engaged in unskilled occupations, while the majority works in construction and machinery sector.

To analyse the determinants of education-occupation mismatch, the actual level of education obtained by the migrant is compared with the level of education which is required for a specific occupation using the definitions in International Standard for the Classification of Occupations (ISCO).[[11]](#footnote-11) The ISCO (2008) maps 9 major groups of occupations to 4 skill levels which are represented in Table A2 in the Appendix.

Tables 2a-2c represent the transition matrix of immigrants’ job mismatch across three different time periods: (i) the transition between the job held in the home country and the first job in Spain after arrival (ii) the transition between the job held in the home country and the current job in Spain (iii) and the transition between the first and the current job in Spain. Looking at the transition matrix in Table 2a, it is clear that approximately 72 per cent of males who have been over-educated in the last job held in their home country were also overeducated in their first job in Spain upon arrival. Similarly, 54 per cent of those having been under-educated at home were also under-educated in their first job in Spain and 55 per cent of those who were correctly matched at home have also been correctly matched in their first job upon arrival. Similar effects are observed in the transition matrix between the last job in their home country and the current job in Spain (Table 2b), and the transition between first job and current job in Spain (Table 2c).

The incidence of overeducation is likely to be a concern only if the wages of the mismatched individuals are lower than those for the correctly matched. [[12]](#footnote-12) That is, if overeducation is the outcome of a trade-off between higher pay for specific jobs that require lower general education than the one gained through schooling, it could be assumed that overeducation might be voluntary, as individuals would benefit from higher wages. However, this is not the case for immigrants in Spain as the average wage of overeducated individuals is lower compared to the mean average wage of the non-overeducated group.[[13]](#footnote-13)

**4. Empirical approach**

***4.1 Incidence of over-education***

Since the primary interest of this paper is to examine the incidence of overeducation, immigrants who were classified as correctly matched and undereducated are combined into one category. This allows us to concentrate only on overeducation, by comparing overeducated immigrants to their non-overeducated counterparts.

In modelling the determinants of a job mismatch between required education and the actual education obtained, we only observe employed immigrants. However, if those employed were non-randomly selected from the host country’s population, the use of a standard probit model would lead to biased and inconsistent estimates of overeducation. In order to control for potential sample selection into employment, a binomial probit model is used which was first introduced by Van de Ven and Van Praag (1981). The model is set up with the following two linear equations:

 (1)

where if the individual is overeducated and

 if not

 (2)

where if the individual is employed and if not .

The latent dependent variable denotes the probability of a migrant being mismatched where represents the presence of a mismatch, is the probability of being in employment, which is represented by a dummy variable equal to 1 if the migrant is employed and 0 otherwise and is only observed if =1. Although equation (2) is fully observed and can be estimated separately, equation (1) may suffer from selection bias due to potential correlations between the two error terms and . That is, after controlling for observed characteristics (in this case immigrants who are in employment), those who are employed may have somewhat different characteristics from the total sample due to unobservable characteristics such as motivation, ability etc. The probit model with sample selection is estimated using a maximum likelihood approach which is represented as follows:

(3)

where ρ represents the correlation coefficient between the error terms and , is the bivariate standard normal cumulative distribution function and represents the univariate standard normal cumulative distribution function.

The parameters of the first two equations are estimated jointly by maximising the log-likelihood function (eq. 3) with respect to the coefficient vectors β and γ and the correlation coefficient ρ. When dealing with selection models, one concern is to identify valid exclusion restrictions, that is, variables which are included in eq. (2) but excluded from eq. (1). In addition, since a number of variables are only observed for the employed individuals, a set of dummy variables is included in the outcome equation but not in the selection equation.

The primary covariates of interest are overeducated in the last job held in the home country and are therefore only used in the outcome equation, after having controlled for selection into employment. Other variables included in the empirical estimations are dummies for age at arrival, marital status, dummies for country of origin, Spanish nationality[[14]](#footnote-14), year of arrival, a dummy variable on whether individuals have validated their studies in Spain[[15]](#footnote-15), house payments pending, renting a house, levels of education, had a job offer prior to arrival and whether they are self-employed as well as controls for regions of residence in Spain. One exclusion covariate, the presence of dependent children in the household (16 years old or younger), is introduced which is important in determining the probability of being in employment but not being mismatched. As the literature has already outlined, the presence of dependent children in the household is expected to increase the probability of employment (see Lundberg and Rose, 2002). The validity of the restriction has been tested by including children as an additional covariate in the outcome equation, and the variables of interest are not affected (see Rodríguez-Planas *et al*., 2012). In addition, the exclusion restriction is insignificant in the outcome equation giving support to the theory, that having children does not affect employment status.[[16]](#footnote-16)

***4.2 Penalty of over-education: The impact of over-education on wages***

In order to model the effect of over-education on immigrants’ wages, we base our analysis on the existing literature by introducing a dummy variable in the wage specification that captures the effect of the mismatch (Verdugo and Verdugo, 1989; Dolton and Vignoles, 2000; Lindley and McIntosh 2010). The impact of a job mismatch on wages is represented by a log linear wage equation as shown below:

 (4)

where represents the log monthly wages of individual *i*, is a dichotomous variable indicating overeducation, indicates a number of socio-economic characteristics which are similar to those used in the overeducation equations including both first job in Spain and home country mismatched work experience[[17]](#footnote-17), and is the error term. The coefficient on the dichotomous variable is expected to be negatively correlated with wages indicating the penalty of over-education.[[18]](#footnote-18) The default category is an individual being non-overeducated. In order to effectively analyse the impact of current and previous mismatched work experience on wages, separate models are estimated by first including only the mismatch effects of one period at a time.

Furthermore, in order to account for possible selection into employment, the wage equation is estimated using a maximum likelihood selection model (Heckman selection model). Similar to the probit selection model, the probability of being employed is modelled using a probit estimation, from which we calculate the inverse mills ratio and include it in the wage equation. The exclusion covariate which is included in the selection equation but not in the wage equation is the same as the one used in the mismatch equation, i.e., presence of dependent children in the household. Following Chiswick and Miller (2010), the model is furthermore disaggregated by distinguishing between those with a tertiary degree and those with a secondary degree or less in order to capture possible differences in the wage penalty of over-education according to the level of formal qualification.

**5 Results and discussion**

***5.1 Incidence of over-education and its determinants***

Tables 3 and 4 present the results obtained from the probit selection models for the probability of being overeducated conditional on being employed. Table 3 shows the probability of being mismatched in their first job in Spain while Table 4 presents the probability of being mismatched in the current job.

The estimate of ρ is significantly different from zero in the current job (Table 4), indicating that the coefficients of eq. (1) would have been biased if a standard binomial probit would have been used without taking into consideration the possible selection problem. The positive coefficient of the error term indicates a positive selection into employment where the error term of the selection equation is positively correlated with the error term of the over-education equation. However, ρ appears to be insignificant for the probability of over-education in the first job (Table 3). This could be due to the fact that only 3 percent of male immigrants have been unemployed throughout their stay in Spain.

The results show that the variables renting a house and owning a house with payments pending are positively correlated with the probability of being employed. The selection into employment is furthermore highly and negatively correlated with the year of arrival in Spain, especially for the current job (see Table 4). This indicates that more recent arrivals are less likely to be employed compared to those who have spent a longer period in the host country. Additionally, the presence of dependent children in the household (16 years or younger) is positively correlated with the probability of being employed in the current job, which is not surprising as male immigrants with children would be under a higher pressure for taking up employment in order to provide financial support and welfare for their family.

After controlling for employment, the main variable of interest is the effect of over-education in the home country on the probability of being mismatched in the Spanish labour market. The results show that a large variation in the probability of being overeducated in Spain in the first job after arrival and partly the variation in the current job, can be explained by the incidence of having been overeducated in the last job held in the home country. Specifically, Table 3 shows that male immigrants who have been overeducated in the last job held in their home country are nearly 40 percent more likely to be overeducated in their first job in Spain upon arrival. The impact of home country mismatch diminishes when it comes to the current job in Spain, with the coefficient of having been overeducated in the home country having dropped to 13 percent. It’s therefore clear that a more recent signal of the real productivity of the mismatched work experience of the previous job has a relatively stronger effect on the probability of being overeducated. Nevertheless, although the effect declines, immigrants appear to continue being mismatched even in their current job in Spain.

Additionally, when controlling for the probability of having been overeducated in the first job in Spain, we observe a substantially higher effect on the probability of being overeducated in the current job than the one obtained from the incidence of overeducation prior to immigration. In particular, those who have been overeducated in their first job are 45 percent more likely to be overeducated in the current job.[[19]](#footnote-19)

Controlling for the year of arrival, we observe that a more recent arrival increases the incidence of over-education in the current job due to the fact that immigrants with a longer duration of stay in the host country gain more experience over time in the Spanish labour market. However, the coefficient is very low indicating that the mismatch incidence does not necessarily improve over time which is consistent with a number of studies indicating that the incidence of over-education is more likely to be permanent (e.g., Dolton and Vignoles, 2000; Lindley and McIntosh, 2010; Nordin et al, 2010; Mavromaras and McGuiness, 2012).

Another interesting result to note is that proficiency in the host country language does not play an important role in the determination of the incidence of a mismatch for immigrants in Spain. The results reveal that those originating from Latin American countries face a similar higher probability of over-education than those from non-Spanish speaking less developed countries. Thus, besides the ‘signal of ability’ Spanish employers receive from real productivity of a previous mismatched work experience, the results show evidence of a signal of imperfect transferability of human capital, regardless of how proficient immigrants are in Spanish. Foreign degree holders from less developed countries may be assessed by Spanish employers as having lower skills and abilities than those obtained from an industrialised country.[[20]](#footnote-20) As supported by Duleep and Regets (1999), the higher the qualification obtained, the more difficult the transferability from one country to another.

In addition, those who have validated their studies in Spain are less likely to be over-educated in their first job upon arrival indicating that those whose qualifications have been formally assessed as equivalent to a Spanish degree have higher chances in finding a matched job (see Table 3). In fact, immigrants who have their degree assessed in Spain have a lower rate of overeducation as only 22 per cent of this group is overeducated.

However, degree validation does not seem to have any effect on immigrants’ current job. A possible explanation could be that host country labour market experience acquired is likely to compensate formal education required in the long run. In contrast to our findings, Green *et al*, 2007 found some positive correlation between immigrants having their qualification assessed and over-education, although the effect is relatively small.

As shown in Table 1, only 5 per cent of employed individuals have assessed their qualifications in Spain. The small number of observations is due to the fact that the majority those who had their degree validation have tertiary level education.[[21]](#footnote-21)

***5.2 The penalty of over-education***

Table 6 presents the results obtained from the Heckman corrected wage equation (4) for male immigrants. The first column includes only controls for overeducation in current job, the second column includes only the effects of having been overeducated in the first job in Spain on current wages, the third column includes only controls of having been overeducated in the home country and the last column reports the wage penalty of current overeducation as well as controls for previous mismatch experience (all controls). The indicator variable represented by the mismatch effect obtained from the first specification has, as expected, a highly significant and negative coefficient. Since the specification also controls for the levels of education, the indicator variable captures the wage differences between matched and mismatched individuals with the same level of education. Overeducated males earn 14 per cent less compared to males who are employed in jobs that match their formal qualifications. When only overeducation variables of first job in Spain are controlled for in the second wage specification, we observe a significant wage penalty of 0.10 log points indicating a persistent wage effect throughout their time in Spain. A significant pay penalty of 8 per cent also exists when adding the indicator variables overeducation of home country job (e.g. wage penalty of having been overeducated at home).

However, the effect of previous mismatch in Spain has a slightly higher coefficient than the home country mismatch effect indicating that the effect of home country mismatch on current wages declines. When all past mismatch experience variables are included in the model together with the indicator variable over-education in current job, the pay penalty of over-education falls to 0.10 log points, but still remains significant. In order to further investigate how long it takes for the mismatch to decline over time, the probit selection model for the incidence of over-education and the wage equation have been re-estimated using interaction variables between time spent in the host country and the level of mismatch at home. The interaction variable does not show any significant effect, which means that the incidence of overeducation does not improve over time.

Interestingly, immigrants originating from Latin America earn lower wages compared to immigrants from developed countries. While one would expect Latin Americans to earn more due to their cultural and language similarities to the Spanish society, the results show that imperfect transferability of human capital is prevalent even for those with perfect host country language skills. In addition, those taking up employment in unskilled occupations may not be required to be fluent in Spanish in order to be hired by their employers. Therefore, even though they have excellent knowledge of the host country’s language, they might not be able to effectively utilise it as an additional ‘skill’ for a job application.

***5.3 The penalty of over-education by levels of education***

In order to capture the effects on wages according to education level, the analysis has furthermore been extended by differentiating between those who have completed tertiary education degree and those with lower level of education than that. The results are shown in Tables 7 and 8 for the higher educated and the lower educated respectively. Similar to the previous wage specifications in Table 6, the first column includes only controls for current overeducation, the second and third columns include only controls for first job and home country job-mismatch respectively, while the last column reports mismatch effects for all three time periods (overeducation in current and first job in Spain and overeducation in the last job held in the home country).

It is noticeable that immigrants with a tertiary education have a substantially higher pay penalty -- 0.29 log points (Table 7 column 1) -- compared to those with only secondary education. Conversely, those without a university degree (with secondary qualification or lower) experience a relatively low pay penalty of 0.06 log points (Table 8 column 1). This dramatic change in the wage earnings according to educational qualifications is consistent with the argument, as outlined in the previous section, that international transferability of educational qualifications is more difficult for higher educated individuals. When controlling for previous mismatches on current wages, we observe large wage penalties of having been overeducated in the first job in Spain for higher educated immigrants. More specifically, higher educated male immigrants who had been overeducated in their first job in Spain suffer a wage penalty of 0.31 log points (Table 7 column 2).

Significant wage penalties of 0.11 log points are also observed for those having been mismatched in the home country (column 3 in Table 7). Although the effect is lower compared to the host country effect, the results indicate that the persistence for higher-educated mismatched immigrants exists even for mismatched work experience in the home country. However, home country mismatch does not have any significant wage effect on the lower educated group (see Table 8). The last specification in Tables 7 and 8 report the estimated wage penalty when previous mismatch effects are included. Controlling for previous mismatch effects, the penalty of overeducation for the higher educated group is substantially reduced to 0.14 log points. However, no difference in the wage penalty is observed when previous mismatched controls are added for the lower educated.

**6. Conclusions**

The objective of this paper was to analyse the determinants of the incidence of education-occupation mismatch as well as its impact on wages in the Spanish labour market. Using the National Immigrant Survey of Spain 2007, a probit selection model was used to estimate the incidence of a mismatch in the first and current job as well as a wage analysis to estimate the penalty of over-education by comparing differences in the wage earnings of over-educated and non-overeducated immigrants.

Using the job analysis method to measure the incidence of a mismatch, the main findings reveal that Spanish employers do take into consideration job experience acquired prior to immigration. However, the effect appears to be larger in the first job upon arrival implying that more recent signals of a previous mismatched job experience have a stronger effect on the probability of overeducation. Similar to this, the productivity/ability signal of a previous mismatched work experience in Spain (first job) has also a strong effect on overeducation in the current job indicating the existence of path dependency in education-occupation mismatch in the Spanish labour market.

Regarding the impact of mismatch on wages, over-educated immigrants earn a significantly lower wage compared to their non-over-educated counterparts. Furthermore, the results show important effects of previous mismatched work experience on current wages, confirming the existence of wage persistence. After controlling for previous mismatched work experience on current wages and reducing the possibility of any bias arising from an unobserved ability throughout the three time periods, the penalty of over-education declines, but remains significant. The analysis has furthermore been extended across levels of education and the results reveal that immigrants with tertiary education experience a relatively larger wage loss compared to those with secondary education or less, while wage persistence of overeducated immigrants shows to be more of a concern for the higher educated group. Similarly, the incidence of a mismatch does not seem to decline with the duration of stay in Spain, indicating that the wage penalty of over-education might be a permanent issue for most immigrants.

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**Table 1 Descriptive statistics of employed males**

|  |  |  |
| --- | --- | --- |
|  |   |   |
| Variables | Male immigrants |
|   | Mean | s.d. |
| log(hourly wage) | 1.86 | 0.38 |
| Hourly wage in euros | 6.98 | 3.99 |
| Age at arrival: < 20 years | 0.07 | 0.25 |
| Age at arrival: 20 - 29 years | 0.49 | 0.5 |
| Age at arrival: 30- 35 years | 0.22 | 0.41 |
| Age at arrival: > 35 years | 0.23 | 0.42 |
| Married | 0.52 | 0.5 |
| Married at time of first job | 0.39 | 0.49 |
| Presence of dependent children (16 years or younger) | 0.37 | 0.48 |
| Average year of arrival  | 2001 | 2.25 |
| Country of origin: Developed countries | 0.13 | 0.33 |
| Country of origin: Latin America | 0.46 | 0.5 |
| Country of origin: Africa | 0.17 | 0.37 |
| Country of origin: Other developing economies | 0.24 | 0.43 |
| Spanish nationality | 0.06 | 0.23 |
| Spanish nationality at time of first job | 0.02 | 0.14 |
| **Educational qualifications** |
| Incomplete primary or less | 0.09 | 0.29 |
| Primary education | 0.17 | 0.37 |
| Secondary | 0.58 | 0.49 |
| First stage Tertiary | 0.14 | 0.35 |
| Second stage tertiary | 0.02 | 0.12 |
| Validated studies in Spain | 0.05 | 0.21 |
| **Occupations (ISCO-08)** |  |
| Managers | 0.03 | 0.16 |
| Technical and scientific professionals | 0.04 | 0.19 |
| Technicians and Associate Professionals | 0.04 | 0.19 |
| Administrative employees/clerical support worker | 0.02 | 0.15 |
| Service and Sales Workers | 0.1 | 0.3 |
| Skilled Agricultural, Forestry and Fishery Workers | 0.02 | 0.15 |
| Craft and Related Trades Workers | 0.37 | 0.48 |
| Plant and Machine Operators and Assemblers | 0.1 | 0.31 |
| Elementary Occupations (Unskilled) | 0.28 | 0.45 |
| **Sectors** |  |  |
| Agriculture, hunting, and forestry | 0.1 | 0.3 |
| Manufacturing, fishing, mining and quarrying, production distribution of electricity , gas and water | 0.17 | 0.37 |
| Construction | 0.41 | 0.49 |
| Trade, repair of motor vehicles and goods | 0.08 | 0.28 |
| Hospitality | 0.08 | 0.26 |
| Transport, storage and communications, financial intermediation | 0.06 | 0.25 |
| Real estate and business services | 0.05 | 0.21 |
| Other (including education, social services and household activities) | 0.06 | 0.23 |
| Had a job offer prior to arrival | 0.2 | 0.4 |
| Self-employed | 0.08 | 0.26 |
| Self-employed in first job | 0.05 | 0.22 |
| Log hours worked per week | 3.75 | 0.25 |
| Renting | 0.68 | 0.47 |
| Renting (first residence) | 0.69 | 0.46 |
| House payments pending | 0.2 | 0.4 |
| House payments pending (first residence) | 0.01 | 0.1 |
| **Region of residence (Autonomous Communities)** |
| Centre | 0.26 | 0.44 |
| Andalusia, Ceuta and Melilla | 0.06 | 0.24 |
| Catalonia and Aragon | 0.18 | 0.39 |
| Valencia and Murcia | 0.2 | 0.4 |
| Cantabrian coast | 0.21 | 0.4 |
| Balearic Islands | 0.06 | 0.23 |
| Canary Islands | 0.04 | 0.19 |
|  |  |  |

|  |
| --- |
| **Table 2a Transition between last job held in home country and first job in Spain (Males)** |
| Job mismatch in home country | Job mismatch in Spain (first Job) |   |
|   | Over-educated | Under-educated | Correctly-matched | Unemployed | Total |
| Over-educated | 72.18 | 4.2 | 20.73 | 2.89 | 100 |
| Under-educated | 15.89 | 53.48 | 27.83 | 2.8 | 100 |
| Correctly-matched | 36.74 | 5.54 | 55.11 | 2.61 | 100 |
| Not working | 34.66 | 22.39 | 36.81 | 6.13 | 100 |
| Total | 34.27 | 22.98 | 39.65 | 3.1 | 100 |

*Notes*: The ‘Not working’ group in the case of job mismatch in the home country also

includes individuals not in the labour force at home since some of them were searching

for employment after arrival in Spain.

|  |
| --- |
| **Table 2b Transition between last job held in home country and current job in Spain (Males)** |
| Job mismatch in home country | Job mismatch in Spain (current Job) |
|   | Over-educated | Under-educated | Correctly-matched | Unemployed | Total |
| Over-educated | 55.38 | 5.51 | 25.98 | 13.12 | 100 |
| Under-educated | 11.53 | 54.52 | 22.33 | 11.63 | 100 |
| Correctly-matched | 20.35 | 6.81 | 61.05 | 11.8 | 100 |
| Not working | 23.31 | 20.55 | 37.12 | 19.02 | 100 |
| Total | 22.33 | 23.83 | 41.12 | 12.72 | 100 |

*Notes*: The ‘Not working’ group in the case of job mismatch in the home country also

includes individuals not in the labour force at home since some of them were searching

for employment after arrival in Spain.

|  |
| --- |
| **Table 2c Transition between first job and current job in Spain (Males)** |
| Job mismatch in Spain (first job) | Job mismatch in Spain (current Job) |   |
|   | Over-educated | Under-educated | Correctly-matched | Unemployed | Total |
| Over-educated | 57.21 | 2.29 | 30.15 | 10.35 | 100 |
| Under-educated | 0.3 | 82.34 | 7.12 | 10.24 | 100 |
| Correctly-matched | 6.71 | 10.4 | 73.52 | 9.37 | 100 |
| Unemployed | - | - | - | 100 | 100 |
| Total | 22.33 | 23.83 | 41.12 | 12.72 | 100 |

*Notes*: There are no observations between the unemployed individuals in the first job in

Spain and any type of mismatch in the current job since those who were unemployed in

the first job and employed in the current job are the ones whose first job is the same as

the current job.

**Table 3 Probability of overeducation in first job and selection into employment (Marginal effects)**

|  |  |
| --- | --- |
|   |   |
| Probit selection model (Male immigrants) |
|   | Over-education (first job) |
| Age at arrival: < 20 years | -0.148\*\* |
|  | (0.0623) |
| Age at arrival: 20-29 years | -0.00528 |
|  | (0.0306) |
| Age at arrival: 30-35 years | 0.0138 |
|  | (0.0332) |
| Married | -0.0382 |
|  | (0.0257) |
| Country of origin: Latin America | 0.285\*\*\* |
|  | (0.0443) |
| Country of origin: Africa | 0.302\*\*\* |
|  | (0.0548) |
| Country of origin: Other developing economies | 0.433\*\*\* |
|  | (0.0422) |
| Year of arrival | -0.00377 |
|  | (0.0368) |
| Renting | -0.00423 |
|  | (0.128) |
| House payments pending | -0.0772 |
|  | (0.172) |
| Spanish nationality | -0.143\*\* |
|  | (0.06) |
| Validated studies in Spain | -0.111\*\*\* |
|  | (0.0428) |
| 2nd stage tertiary education | 0.248\*\*\* |
|  | (0.0853) |
| 1st stage tertiary education | 0.471\*\*\* |
|  | (0.0279) |
| Had a job offer prior to arrival | -0.146\*\*\* |
|  | (0.0321) |
| Self-employed | -0.185\*\*\* |
|  | (0.0528) |
| Mismatch effect HC: over-educated | 0.398\*\*\* |
|  | (0.0333) |
| Mismatch effect HC: not working | 0.116\*\*\* |
|   | (0.0375) |
| **Selection into employment** |
| Age at arrival: < 20 years | -0.0114 |
|  | (0.0105) |
| Age at arrival: 20-29 years | -0.00138 |
|  | (0.00157) |
| Age at arrival: 30-35 years | -0.00163 |
|  | (0.0042) |
| Married | -0.00109 |
|  | (0.00231) |
| Country of origin: Latin America | 0.000346 |
|  | (0.00169) |
| Country of origin: Africa | -0.00181 |
|  | (0.0022) |
| Country of origin: Other developing economies | 0.000333 |
|  | (0.0014) |
| Year of arrival | -0.00246\*\* |
|  | (0.00108) |
| Renting | 0.0115\*\*\* |
|  | (0.00415) |
| House payments pending | 0.00226 |
|  | (0.00144) |
| Spanish nationality | 0.000317 |
|  | (0.00355) |
| Presence of dependent children in the household (16 years or below) | -0.000448 |
|   | (0.00144) |
| Observations | 2,933 |
| Censored | 91 |
| ρ | 0.105 |
|  | (4.386) |
| Wald chi2 | 523.01 |
| Log likelihood | -1763.417 |
| Robust standard errors in parentheses \*\*\*p<0.01, \*\* p<0.05, \* p<0.1 |
| *Notes:* In all specifications we control for regions of residency. The reference group for the Mismatch effect HC is ‘non-over-educated’. The reference group for country of origin in ‘developed countries’ and the reference group for age at arrival is ‘more than 35 years’. The selection equation does also include levels of education and whether immigrants validated their studies in Spain. |
|  |  |
|  |  |
|  |  |

**Table 4 Probability of overeducation in current job and selection into employment (Marginal effects)**

|  |  |
| --- | --- |
|   |   |
| Probit selection model (Male immigrants) |
|   | Over-education (current job) |
| Age at arrival: < 20 years | -0.0398 |
|  | (0.0287) |
| Age at arrival: 20-29 years | -0.0261 |
|  | (0.019) |
| Age at arrival: 30-35 years | -0.0475\*\*\* |
|  | (0.0182) |
| Married | -0.0203 |
|  | (0.0148) |
| Country of origin: Latin America | 0.0822\*\*\* |
|  | (0.0275) |
| Country of origin: Africa | 0.0888\*\* |
|  | (0.0368) |
| Country of origin: Other developing economies | 0.0924\*\*\* |
|  | (0.034) |
| Year of arrival | 0.00755\*\* |
|  | (0.00359) |
| Renting | 0.0071 |
|  | (0.0229) |
| House payments pending | -0.035 |
|  | (0.0253) |
| Spanish nationality | -0.0397 |
|  | (0.0326) |
| Validated studies in Spain | -0.0392 |
|  | (0.0292) |
| 2nd stage tertiary education | 0.211\*\*\* |
|  | (0.061) |
| 1st stage tertiary education | 0.258\*\*\* |
|  | (0.032) |
| Had a job offer prior to arrival | -0.0162 |
|  | (0.017) |
| Self-employed | -0.0757\*\*\* |
|  | (0.0187) |
| Mismatch effect HC: over-educated | 0.132\*\*\* |
|  | (0.0277) |
| Mismatch effect HC: not working | 0.0447\* |
|  | (0.0262) |
| Mismatch effect (first job): over-educated | 0.446\*\*\* |
|   | (0.0185) |
| **Selection into employment** |
| Age at arrival: < 20 years | -0.0613\* |
|  | (0.0316) |
| Age at arrival: 20-29 years | 0.00608 |
|  | (0.0166) |
| Age at arrival: 30-35 years | -0.0211 |
|  | (0.0197) |
| Married | 0.0137 |
|  | (0.0133) |
| Country of origin: Latin America | -0.00408 |
|  | (0.0208) |
| Country of origin: Africa | -0.106\*\*\* |
|  | (0.0308) |
| Country of origin: Other developing economies | -0.0339 |
|  | (0.0243) |
| Year of arrival | -0.0195\*\*\* |
|  | (0.00291) |
| Renting | 0.0460\*\* |
|  | (0.0185) |
| House payments pending | 0.0474\*\*\* |
|  | (0.0182) |
| Spanish nationality | -0.0295 |
|  | (0.0357) |
| Presence of dependent children in the household (16 years or below) | 0.0329\*\* |
|   | (0.0132) |
| Observations | 2,933 |
| Censored | 373 |
| ρ | 1.919\*\*\* |
|  | (0.528) |
| Wald chi2 | 876.88 |
| Log likelihood | -1833.43 |
| Robust standard errors in parentheses \*\*\*p<0.01, \*\* p<0.05, \* p<0.1 |
| *Notes*: In all specifications we control for regions of residency. The reference group for the Mismatch effect HC and first job is 'non-overeducated'. The reference group for country of origin is ‘developed countries’ and the reference group for age at arrival is ‘more than 35 years’. The selection equation does also include levels of education and whether immigrants validated their studies in Spain.  |

**Table 5 Probability of overeducation in current and first job step by step (Marginal effects)**

|  |  |  |
| --- | --- | --- |
|   |   |   |
| Over-education (current job) |
|   | HC mismatch effect | First job mismatch effect |
| Age at arrival: < 20 years | -0.0923\*\*\* | -0.0137 |
|  | (0.0282) | (0.0301) |
| Age at arrival: 20-29 years | -0.032 | -0.0172 |
|  | (0.0209) | (0.0179) |
| Age at arrival: 30-35 years | -0.0386\* | -0.0471\*\*\* |
|  | (0.0224) | (0.0174) |
| Married | -0.0267 | -0.0179 |
|  | (0.0165) | (0.0152) |
| Country of origin: Latin America | 0.192\*\*\* | 0.0694\*\* |
|  | (0.0362) | (0.0298) |
| Country of origin: Africa | 0.225\*\*\* | 0.0819\*\* |
|  | (0.0485) | (0.0372) |
| Country of origin: Other developing economies | 0.277\*\*\* | 0.0840\*\* |
|  | (0.0482) | (0.0342) |
| Year of arrival | 0.00519 | 0.00698\*\* |
|  | (0.00398) | (0.00351) |
| Renting | 0.0294 | 0.0117 |
|  | (0.0247) | (0.0234) |
| House payments pending | -0.0178 | -0.0319 |
|  | (0.0309) | (0.0258) |
| Spanish nationality | -0.0777\*\*\* | -0.0318 |
|  | (0.0283) | (0.032) |
| Validated studies in Spain | -0.0916\*\*\* | -0.0470\* |
|  | (0.0291) | (0.0285) |
| 2nd stage tertiary education | 0.302\*\*\* | 0.260\*\*\* |
|  | (0.0852) | (0.0648) |
| 1st stage tertiary education | 0.457\*\*\* | 0.282\*\*\* |
|  | (0.0395) | (0.0382) |
| Had a job offer prior to arrival | -0.0725\*\*\* | -0.0173 |
|  | (0.0178) | (0.0173) |
| Self-employed | -0.116\*\*\* | -0.0766\*\*\* |
|  | (0.0228) | (0.019) |
| Mismatch effect HC: over-educated | 0.305\*\*\* |  |
|  | (0.037) |  |
| Mismatch effect HC: not working | 0.0925\*\*\* |  |
|  | (0.0346) |  |
| Mismatch effect (first job): over-educated | 0.468\*\*\* |
|   |   | (0.0182) |
| **Selection into employment** |  |
| Age at arrival: < 20 years | -0.0547\* | -0.0606\* |
|  | (0.0305) | (0.0314) |
| Age at arrival: 20-29 years | 0.0115 | 0.00911 |
|  | (0.0159) | (0.0161) |
| Age at arrival: 30-35 years | -0.0192 | -0.0186 |
|  | (0.02) | (0.0191) |
| Married | 0.0161 | 0.0131 |
|  | (0.0135) | (0.0135) |
| Country of origin: Latin America | -0.0133 | -0.00313 |
|  | (0.0206) | (0.0219) |
| Country of origin: Africa | -0.116\*\*\* | -0.107\*\*\* |
|  | (0.0315) | (0.0308) |
| Country of origin: Other developing economies | -0.0409 | -0.033 |
|  | (0.0255) | (0.0244) |
| Year of arrival | -0.0181\*\*\* | -0.0196\*\*\* |
|  | (0.0029) | (0.00291) |
| Renting | 0.0460\*\* | 0.0460\*\* |
|  | (0.0184) | (0.0188) |
| House payments pending | 0.0505\*\*\* | 0.0486\*\*\* |
|  | (0.0178) | (0.018) |
| Spanish nationality | -0.0406 | -0.0347 |
|  | (0.0351) | (0.0343) |
| Presence of dependent children in the household (16 years or below) | 0.0334\*\* | 0.0306\*\* |
|   | (0.0138) | (0.0134) |
| Observations | 2,933 | 2,933 |
| Censored | 373 | 373 |
| ρ | 1.87 | 2.134\* |
|  | (1.785) | (1.266) |
| Wald chi2 | 244.97 | 844 |
| Log likelihood | -2173.809 | -1852.987 |
| Robust standard errors in parentheses \*\*\*p<0.01, \*\* p<0.05, \* p<0.1 |
| *Notes*: In all specifications we control for regions of residency. The reference group for the Mismatch effect HC and first job is 'non-overeducated'. The reference group for country of origin is ‘developed countries’ and the reference group for age at arrival is ‘more than 35 years’. The selection equation does also include levels of education and whether immigrants validated their studies in Spain.  |
|  |  |  |

**Table 6 Penalty of overeducation (Maximum likelihood selection model)**

|  |  |  |
| --- | --- | --- |
|   |   |   |
| Maximum likelihood selection model (Male immigrants) |
|   | Current mismatch effect | First job mismatch effect | HC mismatch effect | All mismatch effects |
| Primary education | -0.0178 | -0.0193 | -0.0226 | -0.0166 |
|  | (0.0224) | (0.0225) | (0.0227) | (0.0224) |
| Secondary education | 0.0497\*\* | 0.0506\*\* | 0.0141 | 0.0691\*\*\* |
|  | (0.0217) | (0.0223) | (0.0216) | (0.0226) |
| 1st stage tertiary education | 0.253\*\*\* | 0.228\*\*\* | 0.176\*\*\* | 0.286\*\*\* |
|  | (0.0337) | (0.0332) | (0.0313) | (0.0363) |
| 2nd stage tertiary education | 0.507\*\*\* | 0.489\*\*\* | 0.457\*\*\* | 0.539\*\*\* |
|  | (0.0822) | (0.0827) | (0.0837) | (0.0821) |
| Mismatch effect (current job): over-educated | -0.137\*\*\* |  |  | -0.102\*\*\* |
|  | (0.0174) |  |  | (0.0183) |
| Mismatch effect (first job): over-educated |  | -0.102\*\*\* |  | -0.0476\*\*\* |
|  |  | (0.0161) |  | (0.0171) |
| Mismatch effect HC: over-educated |  |  | -0.0793\*\*\* | -0.0434\*\* |
|  |  |  | (0.0193) | (0.0188) |
| Mismatch effect HC: not working |  |  | -0.0569\*\* | -0.0470\*\* |
|  |  |  | (0.0226) | (0.0226) |
| Age at arrival: < 20 years | 0.0255 | 0.0276 | 0.0613\* | 0.0448 |
|  | (0.0359) | (0.036) | (0.0367) | (0.0366) |
| Age at arrival: 20-29 years | -0.0362\*\* | -0.0324\* | -0.025 | -0.0292 |
|  | (0.018) | (0.018) | (0.0183) | (0.0181) |
| Age at arrival: 30-35 years | 0.0047 | 0.011 | 0.0116 | 0.00584 |
|  | (0.021) | (0.0211) | (0.0212) | (0.021) |
| Married  | 0.0249 | 0.0283\* | 0.0274\* | 0.0251 |
|  | (0.0163) | (0.0163) | (0.0164) | (0.0162) |
| Country of origin: Latin America | -0.111\*\*\* | -0.114\*\*\* | -0.130\*\*\* | -0.112\*\*\* |
|  | (0.0278) | (0.0279) | (0.0282) | (0.0277) |
| Country of origin: Africa | -0.118\*\* | -0.119\*\* | -0.139\*\*\* | -0.115\*\* |
|  | (0.0477) | (0.0479) | (0.0482) | (0.0475) |
| Country of origin: Other developing economies | -0.0607\* | -0.0575\* | -0.0758\*\* | -0.0579\* |
|  | (0.0313) | (0.0314) | (0.0317) | (0.0311) |
| Year of arrival | -0.00239 | -0.00349 | -0.00399 | -0.00388 |
|  | (0.00859) | (0.00861) | (0.00868) | (0.00855) |
| Renting | -0.014 | -0.0125 | -0.0144 | -0.01 |
|  | (0.0303) | (0.0304) | (0.0308) | (0.0303) |
| House payments pending | 0.0364 | 0.0415 | 0.0415 | 0.0396 |
|  | (0.0368) | (0.0368) | (0.0373) | (0.0368) |
| Spanish nationality | -0.0117 | -0.0113 | -0.0016 | -0.0145 |
|  | (0.0319) | (0.0317) | (0.0321) | (0.0317) |
| Validated studies in Spain | 0.0624 | 0.0668 | 0.0767\* | 0.0582 |
|  | (0.0414) | (0.0416) | (0.0416) | (0.0414) |
| Had a job offer prior to arrival | 0.117\*\*\* | 0.114\*\*\* | 0.124\*\*\* | 0.111\*\*\* |
|  | (0.0176) | (0.0177) | (0.018) | (0.0176) |
| Self-employed | 0.134\*\*\* | 0.140\*\*\* | 0.150\*\*\* | 0.130\*\*\* |
|  | (0.0378) | (0.0378) | (0.0382) | (0.0377) |
| Log hours worked per week | -0.510\*\*\* | -0.513\*\*\* | -0.510\*\*\* | -0.511\*\*\* |
|  | (0.0463) | (0.0459) | (0.0459) | (0.0464) |
| Constant | 8.716 | 10.93 | 11.92 | 11.69 |
|   | (17.12) | (17.18) | (17.32) | (17.04) |
| Observations | 2,560 | 2,560 | 2,560 | 2,560 |
| Inverse mills ratio | -0.469\* | -0.484\*\* | -0.459\* | -0.446\* |
|  | (0.24) | (0.24) | (0.242) | (0.239) |
| R-squared | 0.332 | 0.327 | 0.321 | 0.336 |
| Robust standard errors in parentheses \*\*\*p<0.01, \*\*p<0.5, \*p<0.1 |
| *Notes:* In all specifications we control for regions of residency and sectors of activity in host country (current job). The reference group for the Mismatch effect current job, first job and HC job is 'non-over-educated'. The reference group for the country of origin is ‘developed countries’ and the reference group for age at arrival is ‘more than 35 years’.  |

**Table 7 Penalty of overeducation (Maximum likelihood selection model) by level of education**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |   |   |   |   |
| Maximum likelihood selection model: Tertiary education |
|   | Current mismatch effect | First job mismatch effect | HC mismatch effect | All mismatch effects |
| Mismatch effect (current job): over-educated | -0.289\*\*\* |   |   | -0.136\* |
|  | (0.0627) |  |  | (0.0796) |
| Mismatch effect (first job): over-educated |  | -0.307\*\*\* |  | -0.194\*\* |
|  |  | (0.0708) |  | (0.0911) |
| Mismatch effect HC: over-educated |  |  | -0.106\*\* | -0.0526 |
|  |  |  | (0.0434) | (0.0426) |
| Mismatch effect HC: not working |  |  | -0.0634 | -0.0331 |
|  |  |  | (0.0716) | (0.0716) |
| Constant | 38.39 | 25.49 | 33.23 | 35.19 |
|   | (38.3) | (38.22) | (40.26) | (38.99) |
| Observations | 401 | 401 | 401 | 401 |
| Inverse mills ratio | 0.927 | 0.517 | 0.971 | 0.814 |
|  | (1.221) | (1.205) | (1.269) | (1.233) |
| R-squared | 0.394 | 0.397 | 0.362 | 0.404 |
| Robust standard errors in parentheses \*\*\* p<0.01, \*\*p<0.05, \* p<0.1 |
| *Notes:* In all estimations we control for age at arrival, marital status, dummies for country of origin, year of arrival, Spanish nationality, a dummy variable whether immigrants validated their studies in Spain, renting a house, house payments pending, dummy variables on whether individuals had a job offer prior to arrival, is self-employed, log hours worked per week, regions of residency and sectors of activity in host country (current job) The reference group for the mismatch effect current job, first job and HC is ‘non-over-educated’. |
|  |  |  |  |  |

**Table 8 Penalty of overeducation (Maximum likelihood selection model) by level of education**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |   |   |   |   |
| Maximum likelihood selection model: Secondary education or less |
|   | Current mismatch effect | First job mismatch effect | HC mismatch effect | All mismatch effects |
| Mismatch effect (current job): over-educated | -0.0571\*\*\* |   |   | -0.0520\*\*\* |
|  | (0.015) |  |  | (0.0178) |
| Mismatch effect (first job): over-educated |  | -0.0305\*\* |  | -0.00384 |
|  |  | (0.0132) |  | (0.0159) |
| Mismatch effect HC: over-educated |  |  | -0.0302 | -0.0114 |
|  |  |  | (0.0185) | (0.0196) |
| Mismatch effect HC: not working |  |  | -0.0440\* | -0.0398\* |
|  |  |  | (0.0239) | (0.0241) |
| Constant | 21.22 | 22.58 | 24.09 | 22.69 |
|   | (16.65) | (16.66) | (16.66) | (16.66) |
| Observations | 2,158 | 2,158 | 2,158 | 2,158 |
| Inverse mills ratio | -0.35 | -0.353 | -0.333 | -0.335 |
|  | (0.219) | (0.219) | (0.219) | (0.219) |
| R-squared | 0.286 | 0.283 | 0.283 | 0.287 |
| Robust standard errors in parentheses \*\*\* p<0.01, \*\*p<0.05, \* p<0.1 |
| *Notes:* In all estimations we control for age at arrival, marital status, dummies for country of origin, year of arrival, Spanish nationality, a dummy variable whether immigrants validated their studies in Spain, renting a house, house payments pending, dummy variables on whether individuals had a job offer prior to arrival, is self-employed, log hours worked per week, regions of residency and sectors of activity in host country (current job). The reference group for the mismatch effect current job, first job and HC is 'non-over-educated'.

|  |
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|  |  |  |  |  |

**Appendix**

**Table A1 CNO-94 and ISCO-08**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CNO-94 |   |   |   | ISCO-08 |
| 1 Managers with 10 or more employees2 Managers with less than 10 employees |   |   |   | 1 Managers |  |
| 3 Technicians and Professionals with tertiary education |  |  |  | 2 Professionals |  |
| 4 Technicians and Associate Professionals |   |   |   | 3 Technicians and Associate Professionals |  |
| 5 Administrative employees (Clerks) |  |  | 4 Clerical Support Workers |  |
| 6 Restaurant services workers7 Personal and Protective Service Workers8 Salespersons and Demonstrators |   |   | 5 Services and Sales Workers |  |
| 9 Skilled Agricultural, Forestry and Fishery Workers |  |  | 6 Skilled Agricultural, Forestry and Fishery Workers |  |
| 10 Semi-skilled and Skilled Construction Workers11 Skilled Workers in Extraction and Machinery Mechanics Industries12 Skilled Workers in Printing, Textile and Clothing, Food Processing and Wood Industries  |  |  | 7 Crafts and Related Trades Workers |  |
| 13 Plant and Machine Operators and Assemblers (except motor-vehicle drivers)14 Motor-Vehicle Drivers |  |  | 8 Plant and Machine Operators, and Assemblers |  |
| 15 Domestic Helpers and Cleaners16 Helpers and Cleaners in Offices, Hotels and other Establishments17 Agricultural, Forestry and Fishery Labourers18 Building and other Construction and Maintenance Labourers19 Labourers in Manufacturing, Mining and Transport  |  |  | 9 Elementary Occupations |  |
| 20 Others |  |  | 5 Services and Sales Workers8 Plant and Machine Operators, and Assemblers9 Elementary Occupations |  |

Source: CNO-94 ‘National Classification of Occupations 1994’, National Institute of Statistics (INE) and ISCO-08 ‘International Standard Classification of Occupations’ Volume 1, International Labour Office.

**Table A2 ISCO 2008 - Occupations mapped to educational skill levels**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ISCO major groups |   |   |   | Skill Level |
| 1 Managers |   |   |   | 3 + 4 | Second and first stage tertiary education |
| 2 Professionals |  |  |  | 4 | Second stage tertiary education |
| 3 Technicians and Associate Professionals |   |   |   | 3 | First stage tertiary education |
| 4 Clerical Support Workers |  |  |  2  | Lower or Upper secondary level of education |
| 5 Services and Sales Workers |  |  |
| 6 Skilled Agricultural, Forestry and Fishery Workers |
| 7 Craft and Related Trades Workers |  |
| 8 Plant and Machine Operators, and Assemblers |
| 9 Elementary Occupations |   |   | 1 | Primary level of education |

Source: ISCO-08 ‘International Standard Classification of Occupations’ Volume 1, International Labour Office.

**Figure 1 Employment status in Spain**

Source: Authors’ calculation using the National Immigrant Survey of Spain 2007.

1. For a general survey of the literature, see Hartog (2000), McGuiness (2006) and Leuven and Oosterbeek (2011). For a literature survey specific to immigrant mismatch, see Piracha and Vadean (2013). [↑](#footnote-ref-1)
2. McGuiness (2008) and Mavromaras *et al* (2009), using data from Northern Ireland and Australia, respectively, have also shown that previous mismatch has a significant impact on current mismatch. [↑](#footnote-ref-2)
3. While our focus in this paper is on immigrants only, Fernandez and Ortega (2006), in a rather descriptive paper, compared the incidence of overeducation between natives and immigrants in Spain. Using Spanish Labour Force Survey data (1996-2005), they showed that even after spending five years in Spain, immigrants remained more overeducated than natives. [↑](#footnote-ref-3)
4. Our analysis is done on the male sample because females tend to be tied-migrants and therefore are likely to participate in the labour market only to supplement family income (see Green *et al*, 2007 and Frank, 1978). [↑](#footnote-ref-4)
5. Similar results were found by Dolton and Vignoles (2000) and McGuinness (2003). [↑](#footnote-ref-5)
6. Studies that used the worker self-assessment approach include Sicherman (1991) and Dolton and Vignoles, (2000). [↑](#footnote-ref-6)
7. The terms ‘extraordinary pay checks’ and ‘extraordinary income’ are used in the survey to emphasise that immigrants should also include any salary regularly received other than the wages from their main job. [↑](#footnote-ref-7)
8. Restricting the sample to this time span reduces the bias arising from changes in the composition or quality of immigrants arriving at different points in time (Borjas, 1985 and 1995) and the possibility of return migration (Constant and Massey, 2003; Dustmann and Weis, 2007; Lubotsky, 2007). In addition, Reher *et al* (2008) emphasise that during this 10 year period, immigrants in Spain are homogeneous according to their country of origin. Finally, business cycle effects could also bias the results of labour market entry (Aslund and Rooth, 2007). [↑](#footnote-ref-8)
9. Different time lags were used to check the robustness of the estimates, the results did not change. [↑](#footnote-ref-9)
10. For the presence of dependent children, the age of the child is not observed and therefore a ‘lagged’ variable that reflects the presence of dependent children in the first job cannot be created. To ensure that the results weren’t biased because of this, the estimations of the first job were re-estimated by excluding the children variable and the results did not change. [↑](#footnote-ref-10)
11. Although the National Immigrant Survey of Spain also covers a more extended breakdown of 20 occupations taken from the CNO-94 (National classification of occupations), only the 9 major categories are used in order to be able to match them to the corresponding education level according to the ISCO-08 (see Table A1 in the Appendix for similarities). [↑](#footnote-ref-11)
12. There are also possible non-pecuniary costs of overeducation. For instance, overeducate workers are likely to have higher job dissatisfaction and overall unhappiness which can affect their mental health and can have other psychological implications. Tsang and Levin (1985) showed that job dissatisfaction can result in increased absenteeism and may adversely affect individual productivity. [↑](#footnote-ref-12)
13. The mean hourly wage of the over-educated is 6.41 euros while it is 7.17 euros for the non-overeducated group. This contrast is more pronounced for the relatively better educated as in that case the non-overeducated earn an average of 12.72 euros per hour, while overeducated immigrants with a university degree earn an average of 7.16 euros. [↑](#footnote-ref-13)
14. This variable only includes those who have obtained Spanish nationality after birth at a later stage in life (marriage with Spaniards etc.) [↑](#footnote-ref-14)
15. This variable represents those whose foreign education level has been formally assessed and recognised in Spain as equivalent to a Spanish degree. [↑](#footnote-ref-15)
16. The robustness checks for the exclusion restrictions are available upon request. [↑](#footnote-ref-16)
17. For the wage equations, log hours worked per week as well as sectors of activity are also estimated. [↑](#footnote-ref-17)
18. Unlike existing literature, the effects of a mismatch in the wage equation are captured by mapping the occupations to the corresponding level of education instead of years of schooling. [↑](#footnote-ref-18)
19. These findings are similar to those obtained by Dolton and Vignoles (2000) who found that 38 percent of graduates in the UK were over-educated in their first job and 30 percent were still over-educated six years later. This scarring effect has also been observed by McGuiness (2003) and McGuiness and Wooden (2009). [↑](#footnote-ref-19)
20. See Sanroma et al (2009) for a more detailed analysis of the link between origin country human capital and employment/wage assimilation in Spain. [↑](#footnote-ref-20)
21. 45 percent of those with tertiary education had their qualifications assessed in Spain. However, due to the small number of observations, we were unable to examine the incidence of overeducation according to degree validation. [↑](#footnote-ref-21)