Immigrants, Natives and Job Quality: Evidence from Spain

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Abstract

Purpose – This paper seeks to test for the precondition for labour-market competition between immigrants and natives, which implies that both are willing to accept jobs that do not differ in quality.

Design/methodology/approach - To test this hypothesis, using Spanish data, we analyze whether immigrants and natives exhibit different tastes for working conditions. We proceed as follows. First, we estimate job satisfaction equations, where working conditions enter as covariates. Second, we test whether the package of (dis)amenities inherent to their jobs differ. Additionally, we also test for assimilation of immigrant workers in terms of job quality.

Findings - . We find that immigrant and native workers tend to exhibit the same taste for most on-the-job amenities. However, immigrants are more tolerant with jobs involving poorer environmental working conditions, more physically demanding tasks and higher exposure to physical damage. We also find that immigrant workers tend to be employed in lower quality jobs. However, some of the bad working conditions tend to improve over time, suggesting some assimilation in terms of job quality.

Originality/Value - The type of analysis we carry out here allows us to contribute to the literature by moving a step away from the conventional approach used in previous studies. While previous literature mostly analyzes the effect of immigration in natives' labour market outcomes and assimilation of immigrants in terms of wages and employment, ours is one of the few studies that focus on working conditions and the quality of jobs.

Keywords Job quality, working conditions, immigration, job satisfaction

Paper type Research paper

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1. Introduction

Two majors areas of enquiry in the literature regarding immigration and the labour market are: i) how labour market outcomes of native workers are affected by the presence of immigrants, and; ii) how host labour markets assimilate immigrant workers. The first branch of study looks into the effect of immigration on the employment opportunities of native workers (LaLonde and Topel, 1991; Card, 2001; Borjas, 2003), on their wages (Friedberg and Hunt, 1995; Pischke and Vellking, 1997; Borjas, 1999; Zorlu and Hartog, 2005) and their entrepreneurship activities (Borjas, 1986; Fairlie and Meyer, 1996; Basu, 1998; Clark and Drinkwater, 1998). The second branch, the assimilation theory first introduced by Chiswick in 1978, states that immigrants' wages will tend to converge with their equally qualified native counterparts (see also Borjas, 1985). This "catch-up" process is due to the fact that immigrants will acquire new skills appropriate to the host labour market. Several studies have also focussed on testing this assimilation process in other aspects of the labour market, such as the employment opportunities of immigrant workers (Lindstrom and Massey, 1994; LaLonde and Topel, 1992).

Since Grossman's (1982) seminal paper, the degree of competition in the labour market between natives and immigrants has received considerable attention. Previous international studies suggest that the degree of substitution between immigrant and native workers in low-skilled jobs is fairly small (e.g. Card, 2005; Venturini, 1999; Altonji and Card 1991). However, the most recent evidence is not unequivocal and academic debate on this issue is becoming quite controversial (Ottaviano and Peri, 2005; Borjas et al. 2008). The precondition for labour-market competition between immigrants and natives is that both are willing to accept jobs that do not differ in quality. This issue is relevant, since the most common argument in favour of immigration is that immigrants accept lower quality jobs that natives are less prone to take. On the contrary, the fact that immigrants take jobs away from natives, by e.g. accepting lower wages, is the main argument against immigration. Although these are

crucial aspects of immigration and the labour market, the number of studies comparing the quality of jobs between immigrants and natives is surprisingly scarce. Hamermesh (1998) analysed the quality of jobs for immigrants and native whites, blacks and Hispanics in the US.[1] Gazioglu and Sloane (1994) looked for the existence of compensating wage differentials for job disamenities in the immigrant workforce in the UK.

In this paper, we analyze whether the quality of the jobs taken by immigrants and natives differ. Additionally, we also analyze workers' tastes for on-the-job (dis)amenities as another element to be considered. To do so, we not only compare the working conditions between immigrants and natives, but also use as covariates these working conditions in a job satisfaction equation. We do not try to estimate the degree of substitution between immigrant and native workers or whether immigrants take jobs away from natives. Neither our data, nor our analysis allow for that. However, we find this is a suitable test for the pre-condition of labour market competition. We use Spanish data. More specifically, we resort to the Health Survey of Catalonia 2006 (ESCA2006). For the convenience of this study, our data contain two interesting features: i) it provides information regarding the working conditions for a representative sample of immigrants, and; ii) we can also identify internal migrants, who migrated from the poorer Spanish Southern regions to the richer Catalonia. As we will see in the next section, we think that this scenario allows us to contextualize much better the labour market immigrants meet in the host country if they migrate to a rich region, where low-skilled internal migrants may compete with them for some type of jobs. The type of analysis we carry out here allows us to contribute to the literature by moving a step away from the conventional approach used in previous studies. While previous literature mostly analyzes the effect of immigration in natives' labour market outcomes and assimilation of immigrants in terms of wages and employment, ours is one of the few studies that focus on working conditions and the quality of jobs.

In keeping with the aims described above, this paper is structured as follows. In section 2 we briefly overview internal migration in Spain between the 1960s and 1980s. In section 3 we explain our empirical framework. Section 4 describes the dataset and in section 5 we present the empirical analysis. Finally, section 6 contains a summary and the main conclusions.

2. Migration in Spain: internal migrants vs. immigrants

During the second half of the 20th century Spain experienced a very intensive process of internal migration. This process was especially active between the late 1950s and the 1980s. Internal migration was unidirectional, from the Southern poorer regions of Andalusia, Extremadura, Murcia to the richer regions of Catalonia, Basque Country and Madrid.[2] The Spanish migratory flows mainly consisted of low-skilled workers that moved from rural areas to highly industrialized urban areas. These migratory flows affected more than four million people, of which more than one million ended up in Catalonia. This has led to today's situation in which one quarter of the workforce in Catalonia is made up of Spaniards not born in Catalonia. The primary problems these internal migrants face are that they are generally not well educated and they are an aging segment of the population. Therefore, the majority of them have not been able to assimilate the intensive process of technological change experienced in developed economies during the 1990s. This combination of facts make that Spanish internal migrants are less competitive, and hence less mobile than their Catalan-born workers.

After four decades of intensive internal migration flows, during the last decade immigration from undeveloped and developing countries has also become a very important and controversial issue in Spain. In 1990 there were 407,647 foreign-born legal residents in

Spain, while in 2006 this number rose to 2,804,303, of which approximately 25% live in Catalonia. Foreign-born residents represent almost 10% of the workforce in Catalonia. [3]

According to the 2001 population census internal migrants reported the lowest level of education of the adult resident population in Catalonia. Almost 58.36% of the internal migrants completed only primary education or lower, while these figures are 34.95% and 6.68% for secondary and higher education, respectively. On the other hand, Catalan and foreign-born residents exhibit similar levels of education. For both groups the share of population that completed secondary education was about 50%, while this figure was 15-17% for higher education. Regarding age, only 24.3%of the internal migrants were younger than 45 years old, while these figures were 52.7% and 75.5% for Catalan and foreign born, respectively. All this information is reported in table 1.

Because of the historical picture presented above and the marked differences in the distribution of age and education by population groups, we think that the distinction between Catalan and Spanish non-Catalan born (internal migrants) within the native workforce is crucial. If competition for jobs exists, this would take place between low-skilled Spanish internal migrants and immigrants. In table 1 we report the distribution of occupations and industries according to birthplace. We observe that the distribution of workers by occupations is similar between internals migrants and foreign born workers. They tend be employed in lower skilled jobs than the Catalan born. The percentage of internal migrants employed as blue collars is about 22%, while the percentage working as managers, professionals, technicians or clerical is almost 19%. For foreign born workers, these figures are 23% and 20.5%, respectively. By contrast, only 9.3% of the Catalan are employed as blue collars, while more than 39% work as managers, professionals, technicians or clerical. Data on employment rates by industry show that foreign-born workers are the ones who are more prone to be employed in industries where working conditions are expected to be worse (environmental conditions,

physically demanding tasks, working time, contract type, etc.) Almost 50% of the foreign born workers are employed in agriculture, construction or restoration and commerce, while these figures are 30% and 28.4% for Catalan born and internal migrants, respectively. All this figures taken together suggest that the jobs, and hence working conditions, taken by Catalan-born, internal migrants and immigrant workers are probably different.

[Insert table 1 around here]

[Insert table 2 around here]

3. Empirical framework

A key issue in our study is determining which of the working conditions are perceived as (dis)amenities by the different groups of workers. That is, are the working conditions that generate disutility or positive utility the same for immigrant and native workers? To carry out this analysis we resort to the following empirical strategy. Let define U_{ij} as the utility for a worker *i* in job *j*, which can be expressed as follows:

$$U_{ij} = f(w_j, C_j; X_i), \qquad (1)$$

where w_j and C_j are the earnings and the working conditions linked to a given job, respectively, and X_i a vector of individual characteristics. It is assumed that $U_w = \partial U / \partial w > 0$, and that for a given working condition C_k that if $U_C = \partial U / \partial C \leq 0$, then C_k is a disamenity, while C_k will be an amenity if $U_C = \partial U / \partial C \geq 0$. The utility expressed in equation (1) can be approached by a satisfaction function $S_{ij}(\bullet)$, for which $S_{ij}(\bullet) > S_{kj}(\bullet)$ only if $U_{ij}(\bullet) > U_{kj}(\bullet)$ for $i \neq k$. In this study, we use satisfaction with working conditions as a proxy for the worker's utility. We

assume that the propensity of an individual *i* to report a certain level of satisfaction is driven by the following linear relationship:

$$S_i^* = \alpha + \delta w_i + \sum_k \beta_k C_k + \sum_m \gamma_m X_m + e_i, \quad (2)$$

where S_i^* is a latent outcome regarding worker's satisfaction and e_i is a random error term. According to equation (2), a given working condition C_k is considered as a disamenity if $\beta_k<0$. On the contrary, if $\beta_k>0$, then C_k can be assumed as an amenity. In equation (2), we do not observe S_i^* but instead an indicator variable of the type $S_i=j$ if $\mu_{j-1} < S_i^* \leq \mu_j$ ($j=1, \ldots, J$). Given the ordinal nature of the outcome variable, a natural option to estimate model (4) is the ordinal probit/logit model.

As we mention earlier, a crucial point in this analysis consists in disentangling whether immigrants and natives exhibit different tastes in relation with working conditions. This would be the case if estimated coefficients picking up the effect of working conditions on job satisfaction differ between immigrants and natives. In order to test this hypothesis, in equation (2) we consider interaction terms between birthplace dummies and working conditions. However, one shortcoming in discrete choice models is that the marginal effects of a variable that is interacted with another variable and the interaction term differ from the marginal effect of a variable that is not interacted with any variable. Mallick (2009) shows that marginal effects of the variables interacted and interaction terms are estimated by standard software with large error and even with wrong sign. An alternative option that allows estimating marginal effects for ordered response variables in a linear setting is the Probit Ordinary Least Squares model (POLS), proposed by Van Praag and Ferrer-i-Carbonell (2006). This framework involves the transformation of the observed ordinal outcome $S_i=j$ as $\ln(Z_i) = \left[\phi(\mu_{j-1}) - \phi(\mu_j)\right] / \left[\Phi(\mu_j) - \Phi(\mu_{j-1})\right]$, where $\phi(\bullet)$ and $\Phi(\bullet)$ are the normal density function

and the cumulative normal distribution function, respectively. They show that this transformation enables moving from the ordinal probit framework to the simple linear OLS approach without any loss of efficiency. This is why they call it Probit Ordinary Least Squares (POLS).

In order to test whether immigrants suffer of worse working conditions than natives, we use binary models where a set of dummies picking up workers' birthplace enter in the equation as covariates. In these models, the outcome is a binary variable that reflects the propensity of a worker to accept a given working condition. Additionally, we will carry out separate estimates for the immigrant workers where the variable *years since migration* to Spain (YSM) enters as a covariate in the choice equations. This analysis allows us to test whether exists assimilation in terms of job quality of the immigrant workforce. The package of on-the-job (dis)amenities is mostly inherent in one's choice of labour supply, which in turn depends on socio-demographic and economic factors, among other things. Therefore, in the working conditions choice equations we control for the set of workers' demographic characteristics.

4. Data and variables

The data used in this paper comes from the 2006 Health Survey of Catalonia (*Enquesta de Salut de Catalunya 2006* – ESCA2006), which was conducted by the Regional Government of Catalonia. The survey contains information on a representative sample of individuals residing in Catalonia at the time of the survey. For the first time, in 2006 the ESCA included a representative sample of immigrants. That is, the share of foreign-born individuals in the survey sample is proportional to the share of immigrants residing in Catalonia in 2005. We selected males and females aged between 16 and 65 who declared being employed as salaried. Given the specific characteristics of self-employed workers, we exclude this group from our sample. Our final sample consisted of 9340 adults, of whom 6580 (70.45%) were Catalan-

born, 1850 were internal migrants (19.8%) and 910 were immigrants (9.7%). The composition of the sample of immigrants by birthplace is the following: 380 individuals were born in Latin America (4.1%), 260 were African (2.8%), 150 were born in the EU15 and other wealthy countries (1.6%) and 120 were born in other countries (1.3%)[4].

Surveyed individuals are a random draw of the 2001 Population Registry of Catalonia. This registry is built from the municipal registries of population, where both legal and illegal immigrants can be registered. In Spain, municipal registration as a resident is voluntary, which means that not all the residents in a municipality are necessarily registered in that municipality; however, registration is compulsory in order to have free access to universal public services such as health or education. Therefore, most of the individuals, including illegal immigrants (without permit of residence) have incentives to be registered. Unfortunately, in the ESCA2006 there are no questions regarding the legal status of the immigrants; therefore, we cannot identify them.[5] We acknowledge that this is a limitation in our study; however, even if we were able of identifying illegal immigrants, they should represent a very small fraction of our sample.

The data provides information regarding individuals and households. At the individual level, because this is a health survey, elicited responses mainly refer to a large set of health-related questions. However, the survey also contains items which provide socio-demographic information such as economic status and employment and, conveniently for the purposes of this study, it includes a set of questions regarding the working conditions.

In order to check how representative our sample is, we resort to table 1. In this table we compare our sample coming from the Heath Catalan Survey 2006 with the 2001 Population Census of Catalonia. We show the distribution of the population older than 15 by birthplace, education and age. We observe that the distribution of our sample fits quite well the figures reported by 2001 Population Census.

4.1. Selected variables

The socio-demographic variables used in this study are age, gender, marital status, education, household size, area of residence and birth place. The information regarding working conditions is based on both subjective and objective variables. The subjective ones are the following nine questions: 1) Exposure to noise; 2) Exposure to dust; 3) Move heavy loads; 4) Repetitive movements; 5) Monotonous tasks; 6) Work autonomy; 7) Poor relationship with colleagues; 8) Poor relationship with superiors; 9) Possibility of working alone. Elicited responses are based on a four-point scale. The response scale is: (1) never (2) sometimes (3) often and (4) always.[6] Variable definitions are shown in table 3.

To avoid multicolinearity and overlapping effects problems in the job satisfaction regressions, we use principal component analysis to collapse these nine self-reported working conditions into four orthogonal factors. The resulting factor loadings are quite coherent. The first factor (factor 1) is associated with exposure to noise, dust and moving heavy loads; the second factor (factor 2) refers to the relationship with colleagues and superiors; the third factor (factor 3) refers to monotonous tasks and repetitive movements, and; the fourth factor (factor 4) is associated with the degree of autonomy and the possibility of working alone. The four factors extracted capture almost 70% of the total variation contained by the original set of variables. In table 4 we show the results of the principal component analysis.

In our analysis, the objective information regarding working conditions is based on the following variables: the risk of injury/death at the workplace[7], type of labour contract (without contract, indeterminate duration, fixed-term or no contract), working time (morning, afternoon, night or irregular shifts), number of hours worked per week, flexibility in working time and net monthly earnings. Additionally, for the sample of immigrants, we also used a

variable reflecting whether individuals feel discriminated against in the workplace[8] and the number of years since migration to Spain (*YSM*).

[Insert table 3 around here]

[Insert table 4 around here]

4.2. Descriptive statistics

In table 5 and 6 we show summary statistics of the variables used in the analysis. We also report the results of the tests of equality of means by birthplace for all variables. We found some differences regarding socio-demographic variables and working conditions. Catalan-born workers are the ones who significantly report enjoying the best working conditions, while internal migrants and foreign-born workers report a similar pattern. For the latter group of workers, we also observe some differences by birthplace. African-born workers are the ones who report the worst working conditions, while for Latin American, EU15 and workers from other origins the tests of means do not report statistically significant differences in practically any of the working conditions. Results are commented in more detail bellow.

According to the injury/death risk indicator, on average, African-born workers tend to be employed in riskier jobs, 0.23%, while for the rest of the population groups the average values for this variable ranges from 0.12% for EU15 to 0.14% for internal migrants. The same pattern is observed if we consider flexibility in working time. With the exception of the African-born workers, there are no important differences by birthplace. Only 18.5% of African-born workers report enjoying flexible work hours, while for the rest of groups this percentage ranges between 39.6 and 47.1% for EU15 and Catalan-born workers, respectively.

Regarding self-reported working conditions associated with factor 1 (exposure to dust, noise and move heavy loads), we found that Catalan-born workers report the lowest exposure

to these on-the-job disamenities, while African-born workers report the highest exposure. There were not significant differences by birthplace with regard to the existence of a poor relationship with colleagues and superiors (factor 2). On average, Catalan and EU15-born workers are less likely to be engaged in jobs that involve monotonous tasks and repetitive movements (factor 3) than immigrants and internal migrants. African-born workers report the lowest levels of autonomy in their jobs (factor 4). The discrimination indicator reveals that almost 16% of the immigrant workers report having experienced discrimination in the workplace. By birthplace, the African-born workers are ones who report to feel more discriminated against (28%), followed by Latin Americans (14.4%), other (9.9%) and EU15 (4.9%).

Average net monthly earnings also reveal significant differences by birthplace. Catalan-born workers and EU15 immigrants report practically the same level of earnings (€1,116 and €1,095, respectively), followed by internal migrants (€1,058), Latin American (€936), other origin (€893) and African-born (€819). We also observed notable differences in the types of contracts held. Spanish and EU15-born workers report rates of permanent employment of over 70%, while for African and Latin American workers these rates are 36% and 45%, respectively.

Differences in the socio-demographic characteristics by birthplace are also significant. The internal migrants workforce is considerably older than the Catalan-born and foreign-born workforce. On the other hand, immigrant workers are much younger than native workers, both internal migrants and Catalan-born. Immigrants report similar levels of educational attainment as Catalan-born workers (around 11-12 years of schooling). However, internal migrants are less educated (about 10 years). [9] Splitting immigrants by birthplace reveals that Africans are the least educated (8.9 years), while Latin American and EU15 immigrants (both, 12.4 years) are in fact slightly more educated than Catalan-born workers.[10] One relevant variable in our

analysis is years since migration (*YSM*). This variable splits the sample of immigrants into two groups. On the one hand, the EU15 workers report an average length of stay of over 17.5 years. On the other hand, Latin American and African immigrants, report an average length of stay of approximately 6.6 and 9 years, respectively.

Finally, we also found some differences in the level of satisfaction with working conditions by birthplace. EU15 and Catalan-born workers are the most satisfied, 3.13 and 3.07, respectively, followed by internal migrants (3.00), Latin American (2.92) and African-born workers (2.87). The difference in the average job satisfaction between internal migrants and foreign-born workers is not statistically significant. This circumstance is also observed between Latin American and African-born workers, and between Catalan-born and EU15 workers.

[Insert table 5 around here]

[Insert table 6 around here]

5. Econometric results

5.1. Estimates of the job satisfaction equations

Table 7 reports the results of the estimates of equation (2). We first carried out estimates using the full sample with dummy variables for internal migrants and immigrant workers entering as covariates (not reported). This model indicates that after controlling for the determinants of job satisfaction available in our data, average differences in job satisfaction by birthplace are not statistically significant. This result indicates that we are able to capture most of the variation of workers' job satisfaction by birthplace through the covariates included in the regression. We also estimate two alternative models. In the first (model 1), we interact

birthplace dummies (Catalan, internal migrants and immigrants) with the other covariates included in the job satisfaction equation. Since this model provides one slope for each population group, it is equivalent to estimate three different regressions, one per birthplace. This specification allows us to test what working conditions are statistically significant in each group of workers, but not whether these coefficients are statistically different among them. In model 2, we interact the covariates in the job satisfaction equation with only two of the birthplace dummies (internal migrants and immigrants).This allows us to test whether estimated coefficients for internal migrants and foreign-born workers statistically differ from the estimated coefficients for Catalan-born workers. Results are reported in table 7.

According to model 1, results indicate that the significance of the individual characteristics that determine job satisfaction differ among population groups according to their birthplace. For native workers (Catalan and internal migrants) education does not affect job satisfaction. However, for immigrants this effect is negative and statistically significant. This result, combined with the fact that in our sample immigrants are not, on average, less educated than natives, may suggest that most of the immigrants in our sample are probably overeducated in relation to their jobs. We found that job satisfaction is U-shaped on age for Catalan-born workers; however it is not statistically significant for internal migrants and immigrant workers. This result might indicate low job mobility, at least in terms of job quality, for non-Catalan-born workers. We also observed that gender is not significant in any of the population groups. This result contrasts with the previous evidence reporting a greater job satisfaction for women.

Contract type and the working times also proved significant in determining job satisfaction. Not having a permanent/indefinite contract (fixed-term or without contract) exerts a negative effect on job satisfaction for both Spanish and foreign-born workers. Working at night causes dissatisfaction for immigrant and Catalan-born workers, though this effect is

remarkably larger for immigrants, while working with irregular or changing shifts affects (negatively) job satisfaction for internal migrants and immigrant workers.

An interesting result is the one regarding the effect of the risk of injury. We observe that this variable exerts a statistically significant effect (positive) on job satisfaction only for immigrant workers. This result suggests that foreign-born workers exhibit less aversion than natives to physical risks at the workplace.

Results regarding the effect of self-reported working conditions on job satisfaction indicate that job satisfaction is negatively affected by the existence of poor environmental conditions and physically demanding tasks (factor 1) for Spanish workers (Catalan and non-Catalan), while it is not for immigrants. Poor relations with superiors and colleagues (factor 2) and the execution of tedious tasks (factor 3) exert a significant negative effect on satisfaction in all population groups. Autonomy at the workplace (factor 4) exerts a positive and statistically significant effect on workers' satisfaction only for native workers, while enjoying flexible working hours positively affects job satisfaction in all population groops. Finally, the feeling of working too much depresses job satisfaction for all workers.

In order to test whether estimated coefficients in model 1 are statistically different by birthplace, we resort to model 2. In this model, since the covariates are interacted only with the internal migrant and immigrant dummies, estimated coefficients for these two groups are the difference with the ones reported by Catalan-born workers in model 1. Model 2 allows us to test for the potential existence of differential effects of the covariates on job satisfaction by birthplace. We observe that respect to natives, immigrants workers tend to be significantly less averse to jobs involving bad environmental conditions and physically demanding tasks (factor 1), and a greater risk of injury. On the contrary, they exhibit more aversion to jobs that involve working at night and excess of work. Our results also indicate that these differences are negligible when we compare Catalan-born workers with internal migrants.

We also carried out a separate estimate of the job satisfaction equation for immigrants to test whether jobs satisfaction tends to improve with years since migration to Spain (YSM). We find that this variable does not exert any statistically significant effect on job satisfaction. To test the possibility of differential effects of this variable by birthplace among immigrants, we also experimented with the interactions of the *YSM* with dummies for birthplace, but they turned out to be non-statistically insignificant.[11] This result is comparable to the effect of age for internal migrants, since in both cases it suggests that job satisfaction in the Catalan job market do not improve over time for these two population groups.

In the immigrants' satisfaction equation, we also include as a covariate a proxy for self-perceived on-the-job discrimination. This variable is a four-point ordinal scale. We transform this variable into a binary indicator that takes the value of one if the immigrant worker answers that she feels discriminated against at the workplace (constantly, often or sometimes) and zero if the worker declares that she has never felt discriminated against. The effect of this variable proved statistically significant and negative. We observe that the feeling of being discriminated against at work reduces job satisfaction around 16.1 percent.

Results obtained in this section allow us to conclude that immigrant workers and native workers do not exhibit remarkable differences regarding their taste for most of working (dis)amenities studied here. However, immigrant workers are more tolerant with jobs involving poorer environmental conditions, more physically demanding tasks and more risk of physical damage.

[Insert table 7 around here]

5.2. Estimates of working conditions equations

In the previous section, we test whether immigrants and Spanish-born workers exhibit the same taste for working conditions, which is the precondition for labour market competition. In this section we examine whether on-the-job amenity packages received by natives effectively differ from those received by their immigrant counterparts. We estimate the probability of enjoying/suffering a given (dis)ameninty holding socio-demographic variables constant, i.e. area of residence, age, education, marital status and family size. Additionally, we conduct a separate analysis for immigrants and include as a covariate the years since migration (*YSM*), which allowed us to test whether immigrants' working conditions converge to the ones enjoyed by natives.

According to the estimates of the job satisfaction equations, we consider on-the-job disamenities to be the following working conditions: fixed-term contract, working without contract, working in an occupation-industry with higher risk of injury/accident, working at night or with irregular shifts, poor environmental conditions (factor 1), poor relations with colleagues and superiors (factor 2), repetitive and monotonous tasks (factor 3). Following the same criteria, we assume as amenities: having a permanent or indeterminate duration contract, working the morning or morning/afternoon shift and enjoying flexible working times. We used the conventional probit model when the outcome variable is binary and the linear regression model otherwise (factor 1 to 4). In the separate working conditions equations for immigrants, we also include the variable of whether the worker feels discriminated against in the workplace as a covariate. We include this variable in order to control for the extent to which immigrants who feel discriminated against might exaggerate the level of disamenities they suffer in the workplace. This circumstance is common when working conditions are self-reported. Results are shown in tables 8 and 9. In order to allow for comparisons across alternative models, for the probit models we report estimated marginal effects instead of estimated coefficients. For

the sake of brevity, we omit the comments regarding the effect of the socio-demographic variables.

5.2.1. Differences in working conditions by birthplace

We run regressions with the full sample including a set of dummies picking up worker's birthplace. Once we control for socio-economic factors, we find that internal migrant workers tend to experience worse working conditions than their Catalan-born counterparts. More specifically, this group of workers is more likely: not having a permanent or indefinite duration contract (-4.6%), to enjoy less flexibility in the working time (-3.6%), to be exposed to worse environmental conditions and in more physically demanding jobs (10.8%) and to perform more monotonous tasks (13.0%).[12] Comparing now immigrant workers with Catalan-born workers, we observe that most of the working conditions of EU15-born workers do not differ significantly from those of Catalan-born workers, except those regarding their contractual situation. As internal migrants, EU15-born workers are less likely to have a permanent contract (-7.2) and are more likely to work without a contract (5.5%) than their Catalan-born counterparts. This result indicates that EU15 and Catalan-born workers tend to be employed in jobs where the package of amenities they enjoy is similar.

If we compare Latin American workers with their Catalan-born counterparts, we find that, assessing significance at 5% level, the former group of immigrants suffer worse working conditions in three aspects (having permanent contract, -33.1%, working without contract, 6.3%, working in a risky job, 6%, and performing monotonous tasks. So far, our results indicate that both Latin American and internal migrant workers suffer from worse working conditions than Catalan and EU15-born workers. However, we observe some differences between Latin American and internal migrant workers. Latin American workers report a larger

participation rate than internal migrants in jobs that involve a greater exposure to risk, more flexibility in working time, better environmental conditions and more monotonous tasks.

African-born workers are the ones suffering the worst working conditions. Differences in working conditions for African workers are significantly more important for contractual conditions, flexibility in working times, risk of injury and poor environmental conditions. For instance, respect to native workers, they are the ones that after controlling for socio-demographic characteristics, report the largest difference in the risk of injury/death (18.1%). However, the most important difference between natives and some of the immigrant workers concerns their contractual situation. Respect to natives, the probability of having a permanent contract decreases about 33.1 and 37.8% for Latin American and African workers, respectively.

5.2.2. Assimilation and discrimination

Results reported in this subsection are of special interest, since they explain to which extent immigrant workers improve their working conditions throughout time, i.e. assimilation in terms of job quality. As we explain earlier, to carry out these analyses, we include as a covariate in the working conditions equations for immigrants the variable picking-up the years since they migrated to Spain (YSM). [13]

Our results indicate that there is a certain degree of assimilation of immigrant workers in the improvement of some of their working conditions. The number of years since migration (*YSM*) increases the probability of having a permanent contract, enjoying flexibility in working times and autonomy in the workplace, whereas it reduces the probability of performing monotonous tasks in the workplace and working without a contract. However, the variable *YSM* does not exert a statistically significant effect on the probability of working in a riskier job. We also observe that the effect of the variable YSM on the probability of experiencing

poor environmental conditions is inverted U-shaped. That is, poor environmental conditions increase with *YSM* but it decreases after a given year. The two former results might indicate that while immigrants can improve their legal (type of contract) and, namely, social working conditions with *YSM*, they may experience low job mobility in that regarding the type of jobs they perfom. Immigrant workers employed in low-skilled jobs probably in construction, agriculture and restoration/commerce may experience difficulties in moving to better jobs.

Finally, marginal effects regarding the discrimination variable were found to be statistically significant only in some of the working condition equations. As we might expect, this variable tends to exert a statistically significant effect mostly on self-reported working conditions, which confirms the notion mentioned previously that immigrant workers who feel discriminated against may exaggerate the extent to which they are exposed to job disamenities. In our case, immigrant workers who feel discriminated against in the workplace are more likely to report poorer relations with superiors and colleagues and higher exposure to bad environmental conditions

[Insert table 8 around here]

[Insert table 9 around here]

6. Summary and concluding remarks

In this paper, we study whether immigrants and native workers (dis)like the same on-the-job (dis)amenities. We also test whether immigrants accept lower quality jobs than natives. From the first part of the analysis, i.e. the estimation of the determinants of job satisfaction, we conclude that the tastes for job (dis)amenities between native and immigrant workers differ, but not substantially. We find that immigrant and native workers tend to exhibit the same taste

for most on-the-job amenities. However, immigrants are more tolerant with jobs involving poorer environmental working conditions, more physically demanding tasks and higher exposure to physical damage. In order to test whether immigrants change these preferences over time, we interact working conditions with the variable years since migration (YSM). Again, we observed that these interactions do not exert any significant effect on job satisfaction.

When we analyze whether there exist differences between natives and immigrants workers in the package of on-the-job (dis)amenities, we observed that natives tend to enjoy better contractual conditions than immigrants, though for immigrants this situation tends to improve with years since migration. Regarding the remaining working conditions, we find that EU15 and Catalan-born workers are employed in jobs with similar amenities. On the other hand, African-born immigrants suffer the worst working conditions of all the groups of workers. This situation may be caused by the fact that they are mainly employed in construction and agriculture. It is noteworthy that internal migrants face worse working conditions than their Catalan-born counterparts, and in some aspects also worse than the Latin American workers. All this evidence taken together indicates that the quality of jobs taken by Catalan-born and immigrant workers differ. However, these differences are smaller if we compare internal migrants with immigrant workers.

We acknowledge that a caveat of this paper is that we cannot distinguish between legal and illegal immigrants. It is likely that illegal immigrants should be more prone to accept lower quality jobs than their legal counterparts. Unfortunately, we cannot account for immigrant legal status in our data.

Notes

[1] Hammermesh (1998) used as indicators of job quality the following variables: working time, risk of injury and a set of self-reported subjective variables regarding job security and interest, amount of work, the use of individual's skills and relations with colleagues.

[2] See Bover and Velilla (2002) for a historical overview of internal migration flows in Spain during the 20th century.

[3] Information about immigration flows comes from the Spanish Ministry of Internal Affairs.

[4] EU15 refers to the fifteen EU countries before the expansion in 2004, and the wealthy countries group includes the USA, Canada and Australia.

[5] According to own computations based on the National Immigration Survey 2007 (ENI2007), the share of illegal immigrants among immigrant residents in Spain was nearly 15%. This quantification is consistent with other official sources. For instance, according to the National Statistics Bureau, in 2010 there were in Spain 5.7 million of registered immigrants, but only 4.8 had a residence permit (legal). The difference between these two magnitudes yields the amount of illegal immigrants, who represent around 18% of the immigrant population.

[6] Self-reported working conditions are susceptible to be biased since often survey respondents tend to exaggerate the severity of their status. Panel data fixed-effects models would allow mitigate this problem. Unfortunately, this is an issue that cannot be handled in a cross-section framework.

[7] This information is not contained in the ESCA2006. However, we construct an injury risk indicator using 2006 administrative data from the Ministry of Labour. Our injury risk index is the injury/death rate per 100 employees aggregated into 80 occupation-industry cells (10 occupations and 8 industries).

[8] We include this variable in order to control for the extent to which immigrants who feel discriminated against might exaggerate the level of disamenities they suffer in the workplace (Hamermesh, 1978).

[9] These figures regarding age and education between native and immigrants workers is consistent with the results coming from the 2001 Population Census (table 2).

[10] The fact that immigrants in Catalonia are, on average, more educated than natives do not seem to be a specific feature of immigrants residing in Catalonia. Stoyanova and Diaz-Serrano (2010), using the Spanish Health Survey for 2005, reached the same conclusion for Spain.

[11] The results of the interaction terms between years of residence and origin are not included in table 7.

[12] All the percentages mentioned in section 5.2.1 are the estimated marginal effects for the birthplace dummies in the working conditions equations taking as base category the Catalan-born workers.

[13] The way we test for assimilation is the standard procedure in the literature (Chiswick, 1978). In a cross-section framework, the variable YSM allows us to test whether after controlling for workers' socio-demographic characteristics, the average immigrant are less/more likely to be employed in an occupation with a given (dis)amenity as they last their residence in the host country. That is, whether the average immigrant with *t* years since migration is more satisfied than the average worker with *t+1* years since migration, keeping other things constant. Occupations are not expected to be the same across the distribution of the variable YSM. Therefore, the estimated coefficients for this variable report how the average immigrant worker increases the probability year by year since the migrated to Spain. Undoubtedly panel data would provide a more suitable framework, since we could observe individual's employment transitions over time.

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Table 1: Distribution of the resident population in Catalonia by age and education (Health Survey 2006 vs. 2001 Census)

	Catalan born		Internal migrants		Foreign born	
	2001 Census	**ESCA2006**	**2001 Census**	**ESCA2006**	**2001 Census**	**ESCA2006**
Age						
15-25	15,1%	11,1%	2,1%	1,9%	17,0%	14,8%
25-35	19,8%	26,5%	6,3%	6,2%	33,1%	35,9%
35-45	17,8%	20,2%	15,9%	14,6%	25,3%	28,5%
45-55	15,1%	14,5%	23,1%	22,7%	11,9%	11,4%
55-65	12,0%	9,9%	21,6%	24,5%	5,9%	3,9%
>65	20,2%	17,9%	31,0%	30,1%	6,7%	5,4%
Education						
Primary or lower	32,3%	30,4%	58,4%	59,3%	36,6%	26,1%
Secondary	52,7%	51,3%	35,0%	31,6%	46,2%	52,3%
Higher	15,1%	18,3%	6,7%	9,0%	17,2%	21,6%
% overall population	65,4%	70,5%	28,4%	21,9%	6,2%	7,6%
N	3.742.589	9.916	1.625.804	3.087	356.027	1.067

Table 2: Distribution of employment by occupation and industry by birth of place

	Catalan		Internal migrant		Foreign born	
	N	*%*	*N*	*%*	*N*	*%*
Occupation						
Managers and professionals	1,195	15.81%	224	8.57% [c]	81	8.78%
Technicians and clerical	1,770	23.42%	267	10.21% [c]	107	11.59%
Restoration, services and commerce	1,483	19.62%	432	16.53%	238	25.79%
White collar and operators	2,407	31.85% [b]	1,133	43.34%	285	30.88%
Blue collar	702	9.29%	558	21.35% [c]	212	22.97%
Industry						
Agriculture & fishing, mining and energy	329	4.25% [a]	121	4.53%	64	6.67%
Manufacturing	2,221	28.72%	902	33.80%	175	18.25%
Construction	528	6.83%	251	9.40%	160	16.68%
Hostelry and commerce	1,460	18.88%	386	14.46%	254	26.49%
Transport, communications, finance, real estate and corporate services	1,373	17.76%	394	14.76% [c]	130	13.56%
Education, health and other services	1,822	23.56% [a]	615	23.04%	176	18.35%

Source: Own computations based on the Health Survey of Catalonia 2006

Notes: (a) Equality of means between Catalan and internal migrants is not rejected. Significance is assessed at 5% level
(b) Equality of means between Catalan and immigrants is not rejected. Significance is assessed at 5% level
(c) Equality of means between internal migrants and immigrants is not rejected. Significance is assessed at 5% level

Table 3: Description of the variables ESCA2006

Variable	Description
Demographic characteristics	
Age	
Gender	
Years of schooling	
Married	Dummy variable takes the value 1 if the individual is married
Children	Number of individuals younger than 14 years old living in the household
Years since migration (YSM)	Years since the individual arrived in Spain
Birth place	
Catalan	Dummy variable takes the value 1 if the individual was born in Catalonia
Internal migrants	Dummy variable takes the value 1 if the individual was born in Spain outside of Catalonia
African	Dummy variable takes the value 1 if the individual was born in Africa
Latin American	Dummy variable takes the value 1 if the individual was born in Latin America
EU15	Dummy variable takes the value 1 if the individual was born in one of the 15 countries of the EU before the enlargement of 2004; wealthy countries such as Canada, USA or Australia are also considered in this group
Other	Dummy variable takes the value 1 if the individual was born in Asia, Oceania, Central or Eastern Europe
Objective working conditions	
Weekly hours	Number of hours worked per week
Net monthly earnings	Individual net monthly earnings intervals
Working times	FT Intensive morning; FT Intensive afternoon/evening; FT Intensive night; FT Changing shift; FT Irregular/variable shifts; Part-time; Other
Type of contract	Permanent; Indeterminate duration; Fixed-term; Self-employed; No contract; Other
Risk of injury/death	Percentage of workers that suffered an injury or death of all workers in each occupation-education cell (see table 1 for occupations and industries).
Subjective working conditions	
Flexible working times	Flexibility in working times? (Yes/No)
Working too much	Work too much? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Noise	Exposure to noise? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Dust	Exposure to dust? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Heavy	Move heavy loads? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Repetitive	Work tasks involve repetitive movements? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Monotonous	Work involves monotonous tasks? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Autonomy	Autonomy in the work place? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Alone	Work task involves working alone? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Colleagues	Poor relationship with colleagues? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Superiors	Poor relationship with superiors? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Discrimination	Only for immigrants. Do you feel discriminated against at work? (1. Never; 2. Sometimes; 3. Often; 4. Always)
Job Satisfaction	Satisfaction with the working conditions? (1. Very dissatisfied; 2. Dissatisfied; 3. Satisfied; 4. Very satisfied)

Table 4: Results of the principal component analysis

	Factor 1 (Environmental)	**Factor 2 (Relations)**	**Factor 3 (Monotonous)**	**Factor 4 (Autonomy)**	**Unexplained**
Factor loadings					
Exposure to noise	0,595	0,006	-0,079	-0,190	0,344
Exposure to dust	0,628	-0,017	-0,048	-0,002	0,312
Move heavy loads	0,460	0,010	0,140	0,181	0,484
Monotonous tasks	0,118	-0,028	0,590	0,099	0,363
Repetitive movements	-0,133	-0,012	0,697	-0,201	0,283
Degree of autonomy	-0,031	-0,010	-0,049	0,908	0,132
Working alone	0,092	0,092	0,369	0,231	0,679
Bad relations with colleagues	-0,012	0,707	-0,006	0,025	0,184
Bad relations with superiors	0,006	0,700	-0,010	-0,044	0,184
Statistics					
Variance	1,841	1,646	1,523	1,026	
Difference	0,195	0,123	0,497		
% variance explained	20,5%	18,3%	16,9%	11,4%	
% cummulative	20,5%	38,7%	55,7%	67,1%	

Table 5: Summary statistics (ESCA2006)

	Catalan-born			Internal migrant			Foreign-born		
	Mean	*S.D.*	*N*	*Mean*	*S.D.*	*N*	*Mean*	*S.D.*	*N*
Individual characteristics									
Age	37.471	12.212	6,580	49.258	10.877	1,850	35.105	9.782	910
Years of schooling	11.878	2.954	6,579	9.939	3.346	1,850	11.295	3.643	908
Women	0.502[a]	0.5	6,580	0.496	0.5	1,850	0.427	0.495	910
Household size	3.231	1.151	6,580	3.09	1.104	1,850	3.644	1.59	910
Years living in Spain							8.95	9.542	908
Job characteristics									
Monthly net earnings(€)[1]	1,116.85	325.6	4,677	1057.79	325.92	1,295	923	294.29	679
Weekly hours worked	39.539[a,b]	9.714	5,779	39.946[c]	9.316	1,560	40.245	10.453	811
Permanent contract	0.742	0.438	6,580	0.784	0.412	1,850	0.471	0.499	910
Fixed-term contract	0.222	0.415	6,580	0.162	0.368	1,850	0.436	0.496	910
Without contract	0.032	0.175	6,580	0.051	0.22	1,850	0.091	0.288	910
Working conditions									
Flexible working times	0.382	0.486	5,167	0.315[c]	0.465	1,193	0.305	0.461	745
Risk of injury	0.122	0.149	6,568	0.143	0.147	1,848	0.163	0.174	910
Work too much[2]	2.156	0.997	5,139	2.262[c]	1.054	1,189	2.226	1.019	736
Factor 1									
Exposure to noise[2]	1.655	0.938	5,139	1.796[c]	1.025	1,189	1.772	1.021	736
Exposure to dust[2]	1.595	0.974	5,139	1.816[c]	1.1	1,189	1.865	1.106	736
Move heavy loads[2]	1.562	0.911	5,139	1.68	0.981	1,189	1.78	1.029	736
Factor 2									
Poor relationship with colleagues[2]	1.110[a]	0.451	5,139	1.129[c]	0.493	1,189	1.148	0.523	736
Poor relationship with superiors[2]	1.134[a,b]	0.473	5,139	1.140[c]	0.5	1,189	1.159	0.543	736
Factor 3									
Repetitive movements[2]	2.33	1.191	5,139	2.575[c]	1.193	1,189	2.539	1.173	736
Monotonous tasks[2]	1.969	1.103	5,139	2.268[c]	1.22	1,189	2.308	1.13	736
Factor 4									
Work alone[2]	2.726[a,b]	1.147	5,139	2.691[c]	1.183	1,189	2.345	1.184	736
Work autonomy[2]	1.943[a]	1.095	5,139	1.99	1.148	1,189	1.955	1.122	736
Discrimination							0.158	0.365	877
Satisfaction working conditions[3]	3.074	0.613	5,139	3.001[c]	0.601	1,189	2.971	0.676	736

Notes: (1) This variable is in intervals. We considered the wage to be the middle point of the salary interval reported by the respondent.
(2) The codes for the variable are: 1. Never; 2. Sometimes; 3. Often; 4. Always
(3) The codes for the variable are: 1. Very dissatisfied; 2. Dissatisfied; 3. Satisfied; 4. Very satisfied
(a) Equality of means between Catalan and internal migrants is not rejected. Significance is assessed at 5% level
(b) Equality of means between Catalan and immigrants is not rejected. Significance is assessed at 5% level
(c) Equality of means between internal migrants and immigrants is not rejected. Significance is assessed at 5% level
FT: Full time

Table 6: Summary statistics (ESCA2006)

	African			Latin American			European Union			Other origin		
	Mean	*S.D.*	*N*	*Mean*	*S.D.*	*N*	*Mean*	*S.D.*	*N*	*Mean*	*S.D.*	*N*
Individual characteristics												
Age	34.208[a,c]	9.665	260	35.171[e]	9.564	380	37.127	10.593	150	34.317	9.396	120
Years of schooling	8.903	4.079	259	12.403[d]	2.959	380	12.423	3.126	149	11.55	2.653	120
Women	0.254	0.436	260	0.497[d,e]	0.501	380	0.540[f]	0.500	150	0.442	0.499	120
Household size	3.942[a,c]	1.81	260	3.695[e]	1.502	380	2.987	1.331	150	3.658	1.423	120
Years living in Spain	8.923	8.572	259	6.591	6.909	379	17.513	13.697	150	5.758	5.256	120
Job characteristics												
Monthly net earnings(€)[1]	819.48[c]	216.3	188	935.72	298.0	304	1094.9	362.48	105	893.5	230.5	82
Weekly hours worked	40.21[a,b,c]	9.577	224	40.16[d,e]	11.50	350	39.77[f]	9.312	128	41.11	9.973	109
Permanent contract	0.358	0.48	260	0.447[e]	0.498	380	0.7	0.46	150	0.508	0.502	120
Fixed-term contract	0.538	0.499	260	0.453[e]	0.498	380	0.227	0.42	150	0.425	0.496	120
Without contract	0.104[a,b,c]	0.306	260	0.097[d,e]	0.297	380	0.073[f]	0.262	150	0.067	0.25	120
Working conditions												
Flexible working times	0.163	0.37	199	0.382[d]	0.487	314	0.385	0.489	122	0.255	0.438	101
Risk of injury	0.231	0.198	199	0.134[d,e]	0.158	314	0.117	0.124	122	0.165	0.179	101
Work too much[2]	2.442	1.008	199	2.197[e]	1.004	314	2.049[f]	1.067	122	2.099	0.964	101
Factor 1												
Exposure to noise[2]	1.970[b,c]	1.054	199	1.618[e]	0.949	314	1.861[f]	1.108	122	1.752	0.994	101
Exposure to dust[2]	2.131	1.134	199	1.774[d,e]	1.086	314	1.680[f]	1.07	122	1.851	1.081	101
Move heavy loads[2]	2.206	1.065	199	1.618[d,e]	0.966	314	1.541[f]	0.955	122	1.733	0.999	101
Factor 2												
Poor relation colleagues[2]	1.191[a,b,c]	0.646	199	1.108[d,e]	0.376	314	1.107[f]	0.382	122	1.238	0.737	101
Poor relation superiors[2]	1.216	0.666	199	1.118[d,e]	0.402	314	1.098[f]	0.394	122	1.248	0.754	101
Factor 3												
Repetitive movements[2]	2.683[a]	1.037	199	2.545[d,e]	1.202	314	2.402[f]	1.257	122	2.406	1.21	101
Monotonous tasks[2]	2.427[a,c]	1.041	199	2.315[d,e]	1.18	314	2.131[f]	1.12	122	2.267	1.139	101
Factor 4												
Work alone[2]	1.809[b,c]	0.976	199	2.529[d,e]	1.199	314	2.607[f]	1.168	122	2.515	1.213	101
Work autonomy[2]	1.774	0.987	199	2.080[d,e]	1.184	314	1.967[f]	1.135	122	1.911	1.123	101
Discrimination	0.279	0.45	246	0.144	0.351	372	0.049	0.217	147	0.099	0.3	112
Job satisfaction [3]	2.869[a]	0.683	199	2.92	0.699	314	3.131[f]	0.616	122	3.138	0.633	101

Notes: (1) This variable is in intervals. We considered the wage to be the middle point of the salary interval reported by the respondent.
(2) The codes for the variable are: 1. Never; 2. Sometimes; 3. Often; 4. Always
(3) The codes for the variable are: 1. Very dissatisfied; 2. Dissatisfied; 3. Satisfied; 4. Very satisfied
(a) Equality of means between African and Latin American is not rejected. Significance is assessed at 5% level
(b) Equality of means between African and EU15 is not rejected. Significance is assessed at 5% level
(c) Equality of means between African and other origin is not rejected. Significance is assessed at 5% level
(d) Equality of means between Latin American and EU15 is not rejected. Significance is assessed at 5% level
(e) Equality of means between Latin American and other origin is not rejected. Significance is assessed at 5% level
(f) Equality of means between EU15 and other origin is not rejected. Significance is assessed at 5% level

Table 7: Probit ordinary least squares (POLS) estimates of the satisfaction equations

	Model 1		**Model 2**	
	Coef.	*t-stat*	*Coef.*	*t-stat*
Individual characteristics				
log(Years of schooling)	0.039	1.05		
x internal migrant	0.065	1.07	0.025	0.36
x immigrant	-0.117*	-2.15	-0.156*	-2.38
log(age)	-1.718*	-3.21		
x internal migrant	-0.750	-0.50	0.968	0.61
x immigrant	-1.764	-1.11	-0.046	-0.03
log(age) squared	0.240*	3.17		
x internal migrant	0.100	0.49	-0.139	-0.64
x immigrant	0.253	1.11	0.013	0.05
woman	0.010	0.61		
x internal migrant	0.030	0.81	0.020	0.49
x immigrant	0.027	0.56	0.017	0.33
Contract (base: permanent/ indefinite)				
Fixed-term contract	-0.055*	-2.59		
x internal migrant	-0.073	-1.51	-0.017	-0.33
x immigrant	-0.111*	-2.55	-0.055	-1.14
Without contract	-0.232*	-4.12		
x internal migrant	-0.254*	-2.49	-0.022	-0.19
x immigrant	-0.229*	-2.73	0.003	0.03
Working time (base: fulltime morning-evening shift)				
Fulltime night shift	-0.099***	-1.94		
x internal migrant	-0.096	-1.06	0.003	0.03
x immigrant	-0.375*	-3.43	-0.276*	-2.29
Fulltime Irregular or changing shift	-0.016	-0.59		
x internal migrant	-0.103***	-1.81	-0.087	-1.37
x immigrant	-0.132***	-1.71	-0.116	-1.41
Working conditions				
log(weekly hours worked)	-0.027	-1.35		
x internal migrant	0.000	0.00	0.027	0.54
x immigrant	-0.070	-1.35	-0.043	-0.77
Risk of injury	0.031	1.56		
x internal migrant	-0.009	-0.24	-0.041	-0.93
x immigrant	0.099**	2.03	0.068	1.29
Flexible working times	0.128*	7.84		
x internal migrant	0.116*	3.22	-0.012	-0.30
x immigrant	0.135*	2.90	0.007	0.14

Table 7 (continuation)

	Model 1		**Model 2**	
	Coef.	*t-stat*	*Coef.*	*t-stat*
Factor 1 (Dust, noise, move heavy loads)	-0.051*	-6.00		
x internal migrant	-0.056*	-3.38	-0.004	-0.24
x immigrant	-0.002	-0.11	0.049**	2.12
Factor 2 (Bad relations colleagues and superiors)	-0.076*	-9.85		
x internal migrant	-0.036*	-2.55	0.040**	2.43
x immigrant	-0.061*	-3.55	0.015	0.81
Factor 3 (Repetitive and monotonous tasks)	-0.103*	-11.67		
x internal migrant	-0.092*	-5.40	0.011	0.57
x immigrant	-0.092*	-4.01	0.011	0.44
Factor 4 (Flexibility, working alone)	0.027*	3.33		
x internal migrant	0.047*	2.91	0.019	1.08
x immigrant	0.025	1.17	-0.003	-0.11
Work too much	-0.064*	-7.09		
x internal migrant	-0.070*	-3.96	-0.005	-0.28
x immigrant	-0.133*	-5.56	-0.069*	-2.70
Discriminated against at work - Only immigrants	-0.161*	-2.57		
log(YSM) - Only immigrants	0.001	-0.01		
Origin (base: Catalan)				
Internal migrant	5.598*	6.01	-1.799	-0.62
Immigrant	3.799	1.38	0.695	0.24
Constant	6.293*	2.27	5.598*	6.01

Notes: All regressions include dummies for geographical areas.

(*) Significant at 1% level; (**) Significant at 5% level; (***) Significant at 10% level

Table 8: Estimates of the working condition equations (Binary probit)

	Permanent contract				Without contract				Risk of injury/death[(1)]				Flexibility			
	Full sample		Immigrants		Full sample		Immigrants		Full sample		Immigrants		Full sample		Immigrants	
	m.e.	*z-val.*	*m.e.*	*z-val.*	*m.e.*	*z-val.*	*m.e.*	*z-val.*	*m.e.*	*t-val.*	*m.e.*	*t-val.*	*m.e.*	*t-val.*	*m.e.*	*t-val.*
Years schooling	0.018*	10.63	0.018*	3.22	-0.005*	-10.48	-0.015	-5.38	-0.020*	-13.52	-0.015	-2.89	0.021*	10.65	0.018*	3.20
Age	0.043*	15.73	0.003	1.36	-0.005*	-7.65	0.000	-0.16	-0.001	-1.15	0.003	1.49	0.009*	2.30	0.001	0.27
Age squared	0.000*	-12.84			0.000*	7.82							0.000*	-2.63		
YSM			0.009*	3.61			-0.008	-2.75			-0.002	-0.91			0.005**	2.07
YSM squared							0.000	1.89								
Woman	-0.117*	-12.10	-0.072***	-1.90	0.047*	13.69	0.094	4.82	-0.278*	-31.36	-0.401	-11.48	-0.013	-1.14	0.017	0.46
Household size	-0.012*	-2.93	-0.007	-0.59	0.002**	2.10	0.000	-0.08	-0.003	-0.95	0.009	0.85	0.001	0.13	0.012	1.01
Married	0.078*	5.89	0.097*	2.32	-0.006	-1.54	-0.020	-1.10	-0.006	-0.56	-0.070	-1.79	0.032**	2.06	-0.026	-0.63
Widow	-0.062	-1.63	-0.027	-0.14	0.000	-0.06			0.018	0.52	0.268	1.44	0.121**	2.03	-0.174	-1.02
Separated	0.012	0.42	0.043	0.36	-0.003	-0.45	0.112	1.78	0.003	0.11	-0.100	-0.90	0.073**	2.08	0.092	0.84
Divorced	-0.006	-0.16	0.112	1.06	-0.008	-0.99			-0.021	-0.68	-0.118	-1.13	0.034	0.77	-0.060	-0.64
Discrimination			-0.188*	-3.80			0.002	0.10			0.007	0.15			0.048	0.95
Internal migrants	-0.046*	-3.32			0.001	0.26			0.016	1.40			-0.036**	-2.17		
African	-0.378*	-11.65	-0.212*	-3.45	0.052*	4.71	-0.030	-1.13	0.183*	6.48	0.171	2.86	-0.179***	-4.96	-0.145***	-2.49
Latin American	-0.331*	-12.70	-0.176*	-3.05	0.063*	6.59	-0.008	-0.32	0.060*	2.63	-0.005	-0.10	-0.017	-0.60	0.036	0.67
EU15	-0.072***	-1.88			0.055*	3.72			0.052	1.45			-0.011	-0.25		
Other	-0.244*	-5.49	-0.062	-0.88	0.036*	2.42	-0.045	-1.75	0.065***	1.71	-0.017	-0.26	-0.126*	-2.72	-0.064	-0.98
Log-likelihood		-4,679		-541		-1,334		-218		-4,871		-451		-4,523		-415
Sample size		9,337		875		9,337		841		9,337		875		9,337		731

Notes: m.e. refers to marginal effects; Estimates also include territorial dummies.
(1) The outcome variable is a dummy variable that takes the value 1 if the worker is employed in occupation-industry cell in top quartile of the injury/death distribution; m.e. refers to marginal effects. Estimates also include territorial dummies. (*) Significant at 1% level; (**) Significant at 5% level; (***) Significant at 10% level

Table 9: Estimates of the working condition equations (linear regression)

	Poor environmental conditions (factor 1)				**Poor relations at the workplace (factor 2)**				**Monotonous tasks (factor 3)**			
	Full sample		**Immigrants**		**Full sample**		**Immigrants**		**Full sample**		**Immigrants**	
	m.e.	*z-val.*	*m.e.*	*z-val.*	*m.e.*	*z-val.*	*m.e.*	*z-val.*	*m.e.*	*t-val.*	*m.e.*	*t-val.*
Years schooling	-0.060*	-15.28	-0.025*	-2.10	0.011*	2.53	0.020	1.46	-0.085*	-21.27	-0.040*	-3.48
Age	-0.005*	-3.77	0.001	0.16	0.001	0.99	-0.082*	-2.51	0.007	0.92	0.001	0.29
Age squared							0.001*	2.70	0.000	-1.06		
YSM			0.037*	2.54			0.004	0.71			-0.009***	-1.79
YSM squared			-0.001*	-2.62								
Woman	-0.479*	-20.47	-0.752*	-9.10	-0.039	-1.55	0.017	0.18	0.145*	6.12	0.249*	3.14
Household size	-0.008	-0.77	0.027	1.08	-0.005	-0.45	-0.016	-0.57	-0.007	-0.66	0.016	0.67
Married	0.015	0.50	0.003	0.04	-0.008	-0.25	0.105	0.99	-0.002	-0.05	0.103	1.22
Widow	-0.157	-1.36	0.527	1.21	0.104	0.84	-0.140	-0.28	0.179	1.53	0.061	0.15
Separated	0.056	0.82	-0.480**	-1.97	-0.025	-0.33	-0.033	-0.11	0.013	0.19	-0.140	-0.59
Divorced	0.019	0.23	-0.059	-0.27	0.109	1.20	-0.020	-0.08	-0.013	-0.16	-0.084	-0.40
Discrimination			0.216***	2.00			0.580*	4.66			0.025	0.24
Internal migrants	0.108*	3.26			0.010	0.29			0.130*	3.87		
African	0.168*	2.36	0.025	0.18	0.208*	2.73	0.197	1.26	0.271*	3.76	0.301*	2.32
Latin American	0.010	0.17	-0.065	-0.52	-0.049	-0.80	-0.041	-0.29	0.321*	5.61	0.111	0.93
EU15	0.082	0.93			-0.048	-0.50			0.091	1.01		
Other	0.074	0.77	-0.047	-0.31	0.289*	2.77	0.358**	2.07	0.105	1.07	-0.101	-0.70
Constant	1.091*	12.95	0.635***	2.37	-0.230*	-2.55	0.784	1.22	0.685*	4.41	0.351	1.39
Sample size		7,061		731		7,061		731		7,061		731

Notes: (*) Significant at 1% level; (**) Significant at 5% level; (***) Significant at 10% level