

*Working Paper 2009.2*

**Immigration and Discrimination in a Former  
Emigrant Country: The Case of Spain**

**by**

**José-Ignacio Antón**

**(University of Salamanca)**

**Rafael Muñoz de Bustillo**

**(University of Salamanca)**

**Miguel Carrera**

**(University of Salamanca)**

# IMMIGRATION AND DISCRIMINATION IN A FORMER EMIGRANT COUNTRY: THE CASE OF SPAIN

José-Ignacio Antón (corresponding author) \*

Rafael Muñoz de Bustillo

Miguel Carrera

## ABSTRACT

This article analyses the immigrant-native wage differentials in Spain, which only recently has become a host country. The paper exploits the *Earnings Structure Survey 2006*, which is the first nationally representative sample of both foreign and Spanish employees. Using the Machado-Mata econometric procedure, wage differentials between locals and foreigners are decomposed into the gap related to characteristics and the one due to different returns on endowments (i.e., discrimination). We find that, in absolute terms, the latter component grows across wage distribution, reflecting the existence of a kind of glass ceiling consistent with the evidence of over-education found by previous research.

**KEYWORDS:** Immigration, Wage differentials, Spain, Quantile regression.

**JEL CLASSIFICATION:** J71, F22.

---

\* Department of Applied Economics, University of Salamanca (Spain); Facultad de Derecho, Campus Miguel de Unamuno, s/n. 37007, Salamanca (Spain). Tel: (+34) 923 294500 ext. 1626; Fax: (+34) 923 294516; E-mail: [janton@usal.es](mailto:janton@usal.es)

## 1. INTRODUCTION

Three decades ago Spain was a country of emigrants, with more than 3 million workers abroad (around 10% of the total population), whose remittances financed around 10% of imports, contributing to alleviate serious balance of payments constraints (Oporto del Olmo, 1992). Dwarfing all expectations, in barely ten years, this country has witnessed a gargantuan increase in the number of immigrants. According to the *Spanish Censuses*, the proportion of the population born abroad rose from less than 2% in 1996 to roughly 12% in 2008, which made Spain the country undergoing the third largest increase in non-native population in the European Union during the last decade, after Greece and Ireland (Eurostat, 2006). However, there has been not only a radical shift in migration flows, but also a substantial change in the composition of the immigrant population, which is now predominantly composed of individuals born in countries less developed than Spain. The emergence of such a different reality makes it interesting to look at how immigrant workers are performing in the Spanish labour market, characterized by a high employment creation in construction and low-productivity services but also a high degree of segmentation and fixed-term contracts.

The aim of this paper is to analyse wage differentials between native and immigrant workers in Spain across the wage distribution using a nationally representative database. With that objective, we use a recently released earnings survey containing sufficient observations from immigrants, thus overcoming the problems present in previous studies. This feature makes the study the first one to provide a whole picture of wage penalties faced by foreign workers in Spain. Furthermore, we improve previous estimations by analytically computing standard errors for wage gaps.

The interest of the Spanish case derives not only from the impressive increase in immigration flows experienced by the country during the last decade, but also from the Spaniards' surprisingly rough attitudes towards foreigners according to opinion polls. For example, immigration was considered the most important problem in the country, well above unemployment and housing (CIS,

2006). In addition, most studies on wage discrimination of immigrants are focused on Anglo-Saxon, and Nordic countries, as well as Central Europe and Benelux, which have been the main host countries in the OECD during recent decades.

In spite of the relative novelty of immigration flows to Spain, there is some literature dealing with the labour market integration of foreign workers. The pioneering work of Dolado, Jimeno and Duce (1997) points out a negligible effect of migration on labour market outcomes at the beginning of the nineties, when the intensity of immigrations flows was very low. More recent research exploiting several data sources –among others, the *Spanish Earnings Structure Survey 2002*, which does not offer coverage of small firms- reports similar findings for the second half of the nineties (Carrasco, Jimeno and Ortega, 2008). Other researchers have focused on employment outcomes and occupational segregation of foreign workers, documenting different patterns of labour market integration among foreign-born workers depending both on socio-economic characteristics and country of origin (Amuedo-Dorantes and De la Rica, 2007; Simón, Sanromá and Ramos, 2008). These relatively poor employment outcomes, however, tend to eventually improve with the years of residence in Spain (Fernández and Ortega, 2008). Finally, the work of Canal-Domínguez and Rodríguez-Gutiérrez (2008) is the only one that, to our knowledge, aims to study wage differences between natives and foreigners in Spain, finding a substantial pay gap not explained by observable characteristics and which does not rise across the wage distribution, as in the case of highly educated women –the so-called glass ceiling phenomenon- (De la Rica, Dolado and Llorens, 2008). From our point of view, this work has three main limitations. First, it is based on the *Earnings Structure Survey 2002*, which does not include any information on firms with ten or less workers, which accounts for almost half of salaried workers in Spain. Second, in 2002 migration flows were not as important as they would be later and, according to the *Spanish Labour Force Survey 2002* (2<sup>nd</sup> quarter), less than 3% of employees had a non-Spanish nationality. Finally, this work does not compute any confidence interval for estimates or other mechanisms for determining whether differentials across the distribution are statistically significant.

Regarding international case studies, there is plenty of evidence of important wage differentials between locals and migrants once we control for observable characteristics, although there is no consistent pattern across countries. For example, the pay disadvantage faced by foreign-born workers is concentrated mainly on the bottom of earnings distribution in Sweden (Hammarstedt and Shukur, 2006 and 2007) and the U.K. (Hunt, 2008) and increases along with wages in the U.S. and Australia (Chiswick, Le and Miller, 2008).

Apart from the role of productivity endowments, several theories can explain the existence of wage differentials between locals and migrants.<sup>1</sup> The point of departure is Becker's (1957) view based on employer's tastes: some employers dislike people from other ethnic groups –modelled as a utility loss derived from hiring them- and, in competitive labour markets, if the share of prejudiced employers is sufficiently large, foreign workers might earn a lower wage than locals. Theories of statistical discrimination also offer a framework for understanding the existence of wage gaps between natives and immigrants based on the lack of information or informational asymmetries (Arrow, 1972a, 1972b and 1973; Phelps, 1972). If there is no perfect information on certain characteristics of immigrants (for example, quality of education) or firms have less knowledge about them, employers will tend to base their hiring and pay decisions on observable characteristics of workers, like the ethnic group they belong to. Another interesting perspective of looking at this issue is the idea of monopsonistic discrimination, inspired by Mrs. Robinson's (1933) work on imperfect markets. Drawing on this framework, Barth and Dale-Olsen (2009) suggest that (apparently) unexplained wage differentials are associated with the existence of monopsonistic employers and different labour supply elasticities across population. Other things being equal, those collectives with more rigid labour supplies earn less than otherwise. If immigrant workers are employed in sectors where firms have some market power and their labour supply is less elastic than the local one (for example, because of a lower access to unemployment benefits and so on), their pay will be lower. This last hypothesis

---

<sup>1</sup> See Arrow (1998) for a comprehensive and didactic review.

might be especially relevant for the Spanish labour market, characterized by an excess of labour supply for many years.<sup>2</sup>

The rest of the article unfolds in three parts as follows. Section two provides a brief description of the database used in the paper. The methodology and results of the empirical analysis are discussed in the third part, while the last one summarizes and discusses the main findings of the research

## **2. DATA**

Previous studies of immigrant-native wage differentials have been constrained by serious data limitations, which, to some extent, are linked to the novelty of modern immigration in Spain. However, it should not be neglected that Spain is a step behind other OECD countries regarding data sources for analysing labour market and social outcomes.

This work is based on the *Earnings Structure Survey 2006* (EES), released by the Spanish National Statistics Institute on December 2008.<sup>3</sup> The EES has several advantages over previous databases. Firstly, while neither the *European Community Household Panel* nor the *Social Statistics on Living Conditions* (SILC) –i.e., the household surveys containing information on labour income from the middle-nineties- provides a large enough and representative sample of foreign workers, the EES includes a sample of local and foreign-born employees representative at national level and whose size can be considered appropriate for analysing foreigners' outcomes in isolation. For example, we have more than 10,000 employees born outside the European Union, which is a sample size higher than the whole SILC. In addition, the EES is based on administrative registers of employers, which, as Cowell (1995) points out, increases the reliability of wage data. In the second place, the EES 2006 overcomes the evident limitations of the

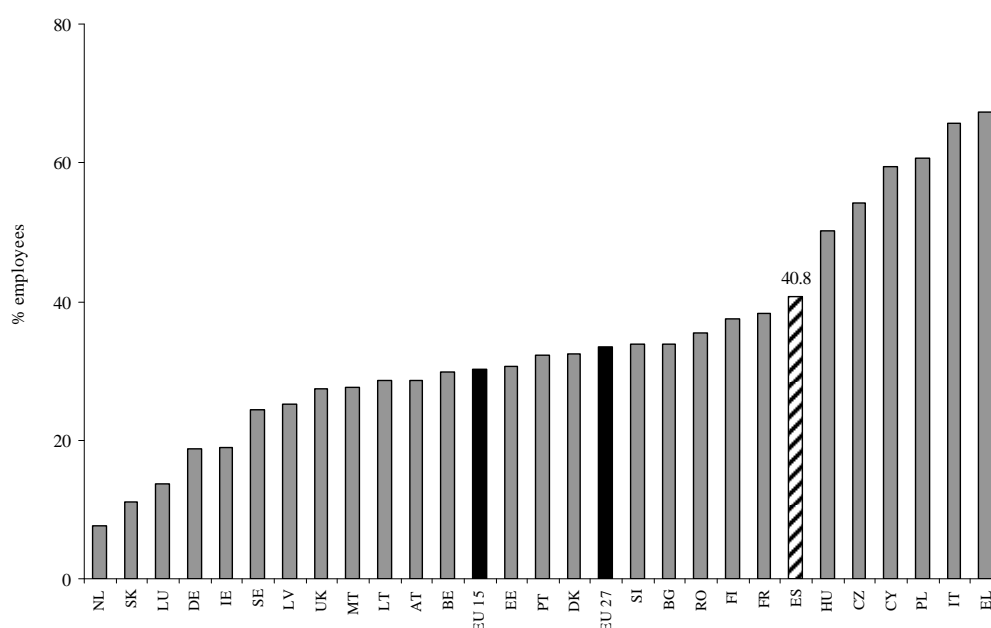
---

<sup>2</sup> According to OECD statistics, nowadays the unemployment rate in Spain is the highest in the European Union (11.3%) and was 8.5% in 2006. Furthermore, the proportion of over-qualified workers is remarkably high, as around 35% of males and 40% of females reported having jobs where their skills were underutilized (Budría and Moro, 2006).

<sup>3</sup> Details on sample design and questionnaires can be found in INE (2008a and 2008b).

previous wave of the survey, carried out in 2002. Firstly, the EES 2002 only contains information on workplaces with ten or more employees, an important shortcoming considering the undeniable relevance of small firms in Spain, where more than 40% of total salaried workers are employed in firms with less than ten workers, being one of the countries where small and medium enterprises account for a largest share of employment in the European Union (figure 1).

Figure 1. Percentage of employees working in firms with less than ten workers (2006-2007)

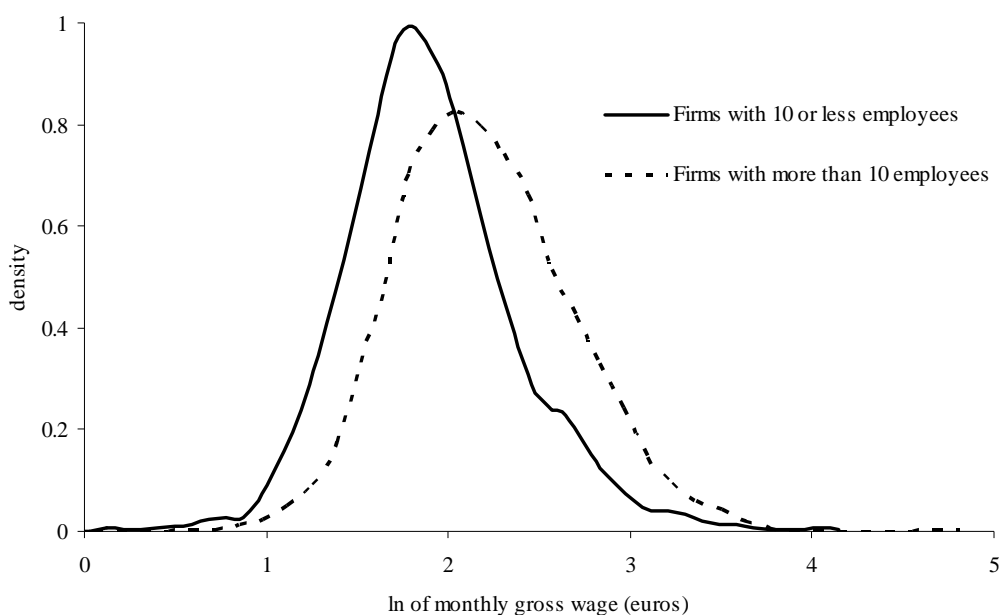


Source: Authors' analysis from 2007 *Observatory of European Small and Medium Enterprises Survey*.

In addition, this shortcoming might be especially problematic, since, according to data from the 2006 SILC, foreign workers are over-represented in small firms: while roughly 40% of native employees work in an enterprise whose size is ten or less, the proportion of immigrants is above 55%. Therefore, it is possible there is a selection bias, which, if it is based on unobservable characteristics or observable covariates not included in econometric analyses of wages, will lead to inconsistent estimation of the effect of human capital endowments on wages. As an illustration of these possible problems, Figure 3, computed from 2006 SILC micro-data, depicts the wage distributions of workers

working in firms with ten or less employees and those salaried individuals in the rest of enterprises.

Figure 2. Wage distributions by firm size (2006)



Source: Authors' analysis from 2006 SILC.

Furthermore, even if this non-negligible problem were absent, the considerable increase in the foreign population in Spain from 2002 to 2006 makes it clear that the issue on which this paper is focused deserves a new look anyway, as wage gaps might change with the intensity of immigration. Particularly, according to the *Spanish Labour Force Survey*, while in 2002 people with a nationality other than Spanish represent less than 3% of the working population aged between 25 and 55, in the 2<sup>nd</sup> quarter of 2006, this group accounts for more than 7% of the reference group.

It is worth mentioning that the database, though signifying a remarkable improvement over previous sources of information, also presents some shortcomings. In the first place, those people working in the informal sector and employees without a work contract are obviously not included in the survey, since



these activities are not legal. The same applies to undocumented foreign individuals. Nevertheless, both problems are probably common to all these sorts of data sources. In addition, agriculture, forestry and fishing sectors are not included by any wave of the Earnings Structure Survey, though, according to the *Spanish Labour Force Survey* they only accounted for 3% of the total salaried population in 2006.

One relevant issue involves the choice of the wage measure to be used in the empirical analysis. It is well-documented that immigrants are usually employed in jobs involving involve harder tasks or worse working conditions (Orrenious and Zavodny, 2009), which can contribute to reducing observed wage gaps if the principle of compensating differentials (at least partially) applies and detailed information on job characteristics is not available for researchers. Therefore, in order to estimate discrimination more precisely, we exclude bonuses associated with dangerous working conditions, night shifts and supplementary hours from our wage measure.

In the second place, it should be mentioned that we limit our analyses to men between 25 and 55 years old for two different reasons. The first one is related to the potential double discrimination suffered by foreign women because of their condition as both females and immigrants. Second, as our database only contains information on employees, there is likely to be some selection bias based on unobservable characteristics. By restricting our analysis to the group with higher employment rates, we try to minimize this bias.

A final point that requires some discussion is the definition of immigrant. The common approach is to consider as immigrants those born abroad, since naturalization rules can differ depending on the country of birth because of special agreements with former colonies and so on. This is, for example, the case of most Latin American workers living in Spain. Unfortunately, this variable is not available in our database, so we have to use citizenship as a proxy for immigrant status. An additional refinement is made: we only categorize as immigrants (and, hence, compare with Spaniards) foreigners with a nationality from geographical regions that, on average, have a lower level of development than Spain. In the

EES 2006, these cases correspond to South America, European countries not belonging the European Union, Oceania, Asia and Africa. There are two reasons for this strategy: first, the rest of the countries are not largely represented among immigrants; second, Spaniards tend to associate immigrants with people from poorer countries, not from other rich EU members or the U.S. or Canada.

As a result, our sample comprises more than 96,000 observations, of which almost 90,000 correspond to Spaniards and approximately 6,200 are foreign workers.

### **3. EMPIRICAL STRATEGY**

This section is divided into three parts. The first one describes the Machado-Mata procedure to decompose gaps across the whole wage distribution, while the second one briefly summarizes the main descriptive statistics of the variables used in the analysis. Finally, we present the main results of the empirical analysis and discuss their implications.

#### **3.1. THE MACHADO-MATA DECOMPOSITION**

The seminal contributions made by Oaxaca (1973) and Blinder (1973) propose relatively simple econometric techniques to decompose the average gap into a component related to observable endowments and another one associated with differences in characteristics (interpreted usually as a measure of discrimination in labour market studies). The main shortcoming of this approach is related to the fact that the gap in a certain outcome between two groups is likely to not be constant across the whole distribution of such outcome. For example, a null mean gap can be simply the average of large gaps of different signs at the tails, which obviously have very different policy implications than the absence of discrimination.

Several approaches have been proposed to address this issue and compute the gaps conditioned on observable characteristics across the whole wage distribution. We follow the approach firstly proposed by Machado and Mata (2005), though we apply their method following the slightly modified but equivalent version suggested by Albrecht, Björklund and Vroman (2003) and De la Rica, Dolado and Llorens (2008).<sup>4</sup> The basic idea is to construct the counterfactual immigrant's wage distribution that would exist in the hypothetical case that immigrants' characteristics were remunerated exactly with the returns locals get for their endowments.<sup>5</sup> In more detail, the procedure unfolds as follows:

- 1) Estimate quantile regressions for 99 percentiles using the native-born employees' dataset.<sup>6</sup>
- 2) For each quantile, take a draw from the locals' sample and compute the predicted log wage for native-born employees at each quantile  $q$ , i.e.,  $x^n b^n(q)$ . Repeat the process for the immigrants' database, calculating the predicted log-wage  $x^m b^n(q)$ .
- 3) Repeat step two  $M$  times and, in this way, obtain a counterfactual distribution of immigrants that reflects their remunerations as if they were paid as locals and the predicted distribution of immigrants retaining their characteristics and specific returns.
- 4) Profiting from the linearity of quantile regression, calculate the counterfactual gap, that is, the wage differential associated with coefficients, as  $x^m b^n(q) - x^m b^m(q)$ .

One task seldom addressed in Spanish literature is the computation of standard errors or interval confidence for the counterfactual gap, a non-negligible issue in order to test if gaps at different quantiles are significantly different from

---

<sup>4</sup> Other ways of analyzing unexplained wage gaps across the whole distribution have been proposed by DiNardo, Fortin and Lemieux (1996), based on semiparametric estimation methods, and Gardeazábal and Ugidos (2005) and Melly (2006) using quantile regression.

<sup>5</sup> We evaluate the gap at natives' coefficients, as De la Rica, Dolado and Llorens do when they address gender discrimination. On the contrary, Albrecht, Björklund and Vroman (2003) use the potentially discriminated group –in their work, women– as the reference group. Using this alternative assumption, we obtained qualitatively similar results. Estimates are available from the authors on request.

<sup>6</sup> We applied a slightly modified version of Machado-Mata's method, as they take random draws from a uniform distribution between 0 and 1. Both approaches are equivalent in large samples.

zero.<sup>7</sup> Two different ways have been proposed in the literature: bootstrapping or deriving an asymptotic expression for the covariance matrix (Albrecht, Van Vuuren and Vroman, 2009). To compute bootstrapped standard errors with large samples might be computationally cumbersome<sup>8</sup>, so we have used the latter procedure, which, as far as we know has only been implemented by Albrecht and his co-authors. The relevant issue here is to compute the variance of the difference between the predicted quantiles of the unconditional counterfactual distributions. According to Albrecht, Van Vuuren and Vroman (2009), the variance of  $\theta_{mn}(q) - \theta_m(q)$  is given by

$$Var[\theta_{mn}(q) - \theta_m(q)] = \frac{1}{99M} \left\{ \frac{q(1-q)}{f_m[\theta_{mn}(q)]^2} + \frac{q(1-q)}{f_m[\theta_m(q)]^2} - 2 \frac{q(1-q)}{f_{mn}[\theta_{mn}(q)]f_m[\theta_m(q)]} \right\} <1>$$

This variance can be consistently estimated using the predicted quantiles,  $\hat{\theta}_m(q) = x^m b^m(q)$  and  $\hat{\theta}_{mn}(q) = x^m b^n(q)$  -which Albrecht and his co-authors prove to be consistent estimators of the true quantiles  $\theta_m(q)$  and  $\theta_{mn}(q)$ - and estimating by kernel density  $f_{mn}(\cdot)$  and  $f_m(\cdot)$ , which represents the density functions of the counterfactual distributions evaluated at each percentile. Obviously, the population density functions are not known; however, as long as the sample is large, it is possible to estimate them using kernel density methods.<sup>9</sup> Note that standard errors for the difference between  $\hat{\theta}_m(q)$  and  $\hat{\theta}_n(q)$  will be larger, since they are not correlated and, hence, the covariance is null.

The procedure described above allows us to compute not only the estimated gap at each quantile, but also to determine if those differentials are statistically significant.

Regarding quantile regressions, following Koenker (2005), the model to be estimated can be expressed in the following way:

---

<sup>7</sup> De la Rica, Dolado and Llorens's (2008) work is a remarkable exception to this trend.

<sup>8</sup> For example, with our database, it took us more than two hours to run the model in Stata once.

<sup>9</sup> Particularly, we use a Gaussian kernel and the optimal bandwidth suggested by Silverman (1986).

$$Y(q) = x\beta(q) + \varepsilon(q) \quad \langle 2 \rangle$$

where  $Y$  denotes monthly gross wages (in logs),  $x$  includes a set of employee's observable characteristics,  $\beta_q$  is the parameter to be estimated, which captures the proportional wage change in the  $q^{th}$  quantile conditional on  $x$  and  $\varepsilon_q$  is a disturbance satisfying  $E(u(q) | x) = 0$ . Therefore, one can write conditional population quantiles  $Quant_q(Y | X = x)$  as

$$Quant_q(Y | X = x) = x\beta(q) \quad \langle 3 \rangle$$

$\beta$  can be consistently estimated by minimising the sum of weighted absolute deviations using  $q$  and  $1-q$  as weighting factors for positive and negative errors, respectively. Finally, the set of covariates includes age, squared age, education, tenure, firm size and regional dummies.

### 3.2. DESCRIPTIVE STATISTICS

The main descriptive statistics of the sample used in the analysis are reproduced in Table 1. They basically indicate that immigrants are younger and have lower stocks of human capital –educational level and tenure- than nationals. In addition, foreign workers tend to be concentrated in small and medium-size firms.

Table 1. Main descriptive statistics

	Spaniards		Immigrants	
	Mean	Standard deviation	Mean	Standard deviation
Hourly gross wage (euros)	7.08	4.51	5.46	2.17
Age	38.48	8.42	35.04	7.29
Education				
Less than primary education	0.0673	0.2505	0.2018	0.4013
Primary education	0.1955	0.3966	0.4270	0.4947
Lower secondary education	0.2892	0.4534	0.2265	0.4186
Upper secondary education	0.2558	0.4363	0.1001	0.3001
University	0.1922	0.3940	0.0448	0.2068
Tenure	7.15	8.20	1.48	1.99
Firm size				
Less than 50 employees	0.5874	0.4923	0.7799	0.4143
Between 50 and 199 employees	0.1891	0.3916	0.1452	0.3523
200 employees or more	0.2235	0.4166	0.0749	0.2632

Source: Authors' analysis from ESS 2006.

### 3.3. ECONOMETRIC RESULTS

Selected quantile regressions (at the 10<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 90<sup>th</sup> percentiles) for Spaniards and immigrants are presented in Tables 2 and 3, respectively.

Table 2. Estimated results for quantile for male native-born employees (2006)

	Coefficients (standard errors in brackets) by percentile				
	10th	25th	50th	75th	90th
Age	0.009 *** (0.002)	0.008 *** (0.002)	0.009 *** (0.001)	0.017 *** (0.002)	0.025 *** (0.003)
Squared age	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)
Education (less than primary education=0)					
Primary education	-0.008 (0.008)	-0.006 (0.006)	0.000 (0.006)	0.014 * (0.008)	0.043 *** (0.013)
Lower Secondary education	-0.005 (0.008)	0.007 (0.006)	0.014 ** (0.006)	0.021 *** (0.007)	0.044 *** (0.013)
Upper secondary education	0.059 *** (0.008)	0.083 *** (0.006)	0.114 *** (0.006)	0.183 *** (0.007)	0.290 *** (0.013)
University education	0.228 *** (0.008)	0.285 *** (0.006)	0.392 *** (0.006)	0.578 *** (0.008)	0.715 *** (0.014)
Tenure	0.005 *** (0.000)	0.006 *** (0.000)	0.007 *** (0.000)	0.010 *** (0.000)	0.013 *** (0.000)
Firm size (less than 50 employees=0)					
50-199 employees	0.007 (0.004)	0.020 *** (0.003)	0.022 *** (0.003)	0.031 *** (0.004)	0.050 *** (0.007)
200 or more employees	0.027 *** (0.005)	0.043 *** (0.003)	0.081 *** (0.003)	0.147 *** (0.004)	0.175 *** (0.007)
Observations	8,970	8,970	8,970	8,970	8,970
McFadden R <sup>2</sup>	0.057	0.078	0.127	0.197	0.222

\*\*\* significant at 1%; \*\* significant at 5%; \* significant at 10%.

Note: An intercept and seventeen regional dummies are also included in all regressions.

Source: Authors' analysis from ESS 2006.

Table 3. Estimated results for quantile for male foreign-born employees (2006)

	Coefficients (standard errors in brackets) by percentile				
	10th	25th	50th	75th	90th
Age	0.001 (0.005)	-0.003 (0.005)	0.000 (0.003)	-0.015 *** (0.004)	-0.014 * (0.008)
Squared age	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 *** (0.000)	0.000 * (0.000)
Education (less than primary education=0)					
Primary education	0.006 (0.010)	-0.006 (0.011)	-0.007 (0.007)	0.016 * (0.009)	0.008 (0.018)
Lower Secondary education	-0.008 (0.011)	-0.009 (0.012)	-0.008 (0.007)	0.022 ** (0.010)	-0.005 (0.018)
Upper secondary education	0.018 (0.014)	0.037 ** (0.015)	0.071 *** (0.009)	0.089 *** (0.012)	0.093 *** (0.023)
University education	0.059 *** (0.018)	0.103 *** (0.019)	0.138 *** (0.012)	0.326 *** (0.016)	0.605 *** (0.030)
Tenure	0.003 (0.002)	0.007 *** (0.002)	0.009 *** (0.001)	0.007 *** (0.001)	0.023 *** (0.003)
Firm size (less than 50 employees=0)					
50-199 employees	-0.021 ** (0.009)	0.001 (0.009)	0.004 (0.006)	0.005 (0.008)	0.024 (0.015)
200 or more employees	-0.027 ** (0.011)	-0.026 ** (0.012)	-0.015 ** (0.008)	0.010 (0.010)	0.039 ** (0.019)
Observations	6,240	6,240	6,240	6,240	6,240
McFadden R <sup>2</sup>	0.055	0.676	0.050	0.065	0.097

\*\*\* significant at 1%; \*\* significant at 5%; \* significant at 10%.

Note: An intercept and seventeen regional dummies are also included in all regressions.

Source: Authors' analysis from ESS 2006.

Estimates of the wage gap associated with differences in returns –that is, the component aiming to proxy for discrimination- are computed following the method described above and presented in Table 4 and Figures 3 and 4. The counterfactual gap is significantly different from zero across the whole distribution. In general terms, our results point to the existence of increasing wage differentials across the distribution conditioned on endowments; pointing to the existence of a sort of glass ceiling similar to those described for female workers. In fact, previous works have identified a higher degree of over-education among



immigrants than among Spaniards (Fernández and Ortega, 2008). At the bottom, the gap is very small, which might be explained by two factors. Firstly, by the existence of compensating differentials not remunerated by specific bonuses but included in the base wage. As long as immigrants' jobs can involve riskier and unpleasant work activities or environments that yield some wage premium, differences at the bottom may be understandably lower. In the second place, our database is limited to formal and legal work relations, so all benefits and constraints associated with labour market institutions apply here. For example, collective bargaining agreements and minimum wages (which have considerably risen since 2004) might be contributing to the existence of a lower gap at the bottom by imposing minimum earnings thresholds. However, it is also noteworthy that there is a slight increase of the pay gap around the 20<sup>th</sup> percentile, which is not easy to interpret. A possible explanation, following the arguments of Hammarstedt and Shukur (2008) for Sweden, would be the existence of a group of foreign workers who have just arrived in the country and whose human capital endowments are not fully transferable to the Spanish labour market in the short or medium run, a circumstance that could be reinforced by an eventual lack of language proficiency.

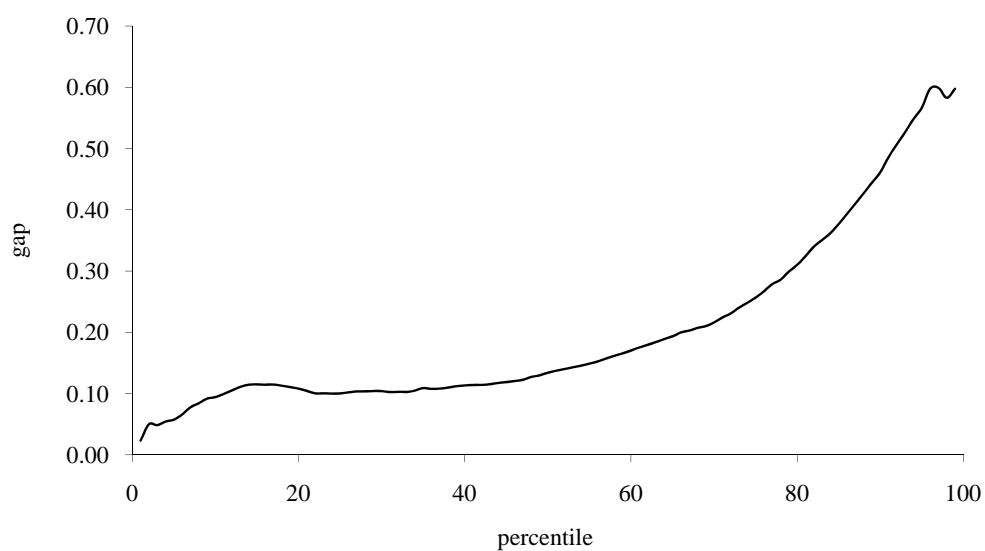
*Table 4.* Estimated raw and counterfactual wage gaps by percentile between local and migrant employees (2006)

Percentile	Raw gap (Standard errors in brackets)	Counterfactual gap (Standard errors in brackets)
10th	0.094*** (0.006)	0.047*** (0.001)
25th	0.100*** (0.006)	0.038*** (0.001)
50th	0.134*** (0.005)	0.027*** (0.000)
75th	0.257*** (0.008)	0.052*** (0.001)
90th	0.461*** (0.013)	0.136*** (0.004)

\*\*\* significant at 1%; \*\* significant at 5%; \* significant at 10%.

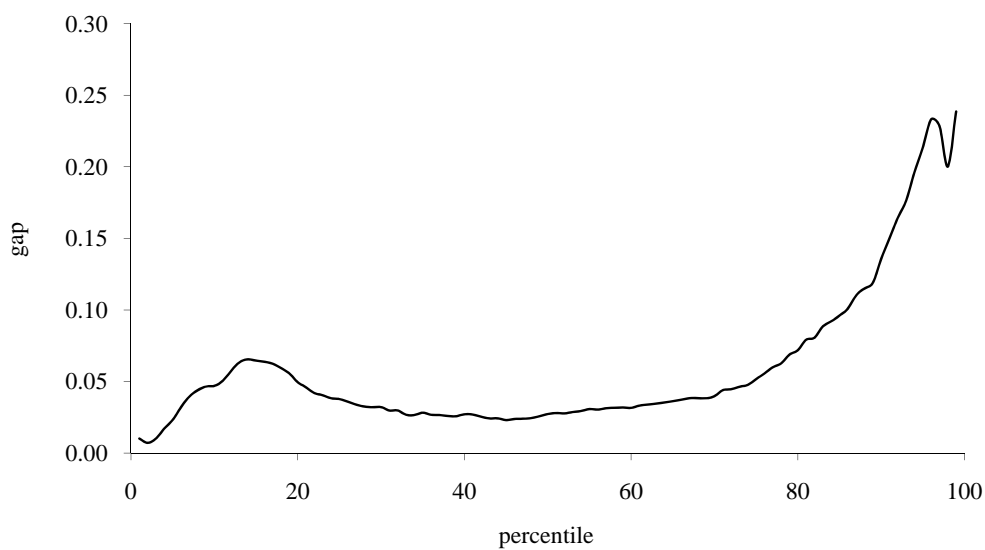
Source: Authors' analysis from ESS 2006.

Figure 3. Raw wage gap between local and migrant employees in Spain (2006)



Source: Authors' analysis from EES 2006.

Figure 4. Wage gap explained by differences in returns between local and migrant employees in Spain (2006)



Source: Authors' analysis from EES 2006.

## 4. CONCLUSIONS

Immigration has become an increasingly important phenomenon in Spain, a country that had been country of emigrants until few years ago. In this paper, we have analysed the native-immigrant wage gap across the whole distribution using the M-M decomposition. The main contribution of the paper has been to address the issue for first time using a representative survey of the labour force and not limiting the scope of the analysis to large firms, which are not numerous in Spain and among which foreign-born workers are under-represented. In addition, standard errors for counterfactual gaps have been estimated, a task not addressed by previous research on the topic in Spain or in most other national case studies.

The main finding of the paper is the existence of an important glass ceiling for foreign workers from developing countries living in Spain, that is, the wage gap significantly grows across wage distribution, reaching around 25% for the last wage decile.

## REFERENCES

- Amuedo-Dorantes, C. and De la Rica, S. (2007): "Labor Market Assimilation of Recent Immigrants in Spain", *British Journal of Industrial Relations*, 45(2), 257-284.
- Arrow, K.J. (1972a): "Models of Job Discrimination", in A.H. Pascal (ed.) *Racial Discrimination in Economic Life*, Lexington: D.C. Heath, 83-102.
- Arrow, K.J. (1972b): "Some Mathematical Models of Race Discrimination in the Labor Market", in A.H. Pascal (ed.) *Racial Discrimination in Economic Life*, Lexington: D.C. Heath, 187-204.
- Arrow, K.J. (1973): "The Theory of Discrimination", in O. Ashenfelter and A. Rees (eds.) *Discrimination in Labor Markets*, Princeton: Princeton University Press, 3-33.
- Arrow, K.J. (1998): "What Has Economics to Say about Racial Discrimination?", *Journal of Economic Perspectives*, 12(2), 91-100.
- Barth, E. and Dale-Olsen, H. (2009): "Monopsonistic Discrimination, Worker Turnover and the Gender Wage Gap", IZA Discussion Paper No. 3930.
- Becker, G.S. (1957): *The Economics of Discrimination*, Chicago: Chicago University Press.
- Budría, S. and Moro, A.I. (2008): "Education, educational mismatch, and wage inequality: evidence for Spain", *Economics of Education Review*, 27(3), 332-341.

- Canal-Domínguez, J.F. and Rodríguez-Gutiérrez, C. (2008): “Analysis of wage differences between native and immigrant workers in Spain”, *Spanish Economic Review*, 10(2), 109-134.
- Carrasco, R., Jimeno, J.F. and Ortega, C. (2008): “The effect of immigration on labor market performance of native-born workers: some evidence for Spain”, *Journal of Population Economics*, 21(3), 627-648.
- Centro de Investigaciones Sociológicas (CIS) (2006) *Barómetro Septiembre 2006*, Madrid: CIS.
- Chiswick, B., Le, A.T. and Miller, P.W. (2008): “How Immigrants Fare across the Earnings Distribution in Australia and the United States”, *Industrial and Labor Relations Review*, 61(3), 353-373.
- Cowell, F.A. (1995): *Measuring Inequality*, 2<sup>nd</sup> edition, Hemel Hempstead: Harvester Wheatsheaf.
- De la Rica, S., Dolado, J.J. and Llorens, V. (2008): “Ceilings or floors? Gender wage gaps by education in Spain”, *Journal of Population Economics*, 21(3), 751-776.
- DiNardo, J., Fortin, N.M. and Lemieux, T. (1996): “Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach”, *Econometrica*, 64(5), 1001-1044.
- Dolado, J.J., Jimeno, J.J. and Duce, R. (1997): “Los efectos de la inmigración sobre la demanda de trabajo cualificado vs. Poco cualificado: evidencia para España”, *Cuadernos Económicos del ICE*, 64, 11-29.
- Eurostat (2006): “Non-national populations in the EU Member States”, *Statistics in focus*, 8/2006.
- Fernández, C. and Ortega, C. (2008): “Labor market assimilation of immigrants in Spain: employment at the expense of bad job-matches”, *Spanish Economic Review*, 10(2), 83-107.
- Gardeazábal, J. and Ugidos, A. (2005): “Gender discrimination at quantiles”, *Journal of Population Economics*, 18(1), 165 -179.
- Hammarstedt, M. and Shukur, G. (2006): “Immigrants’ relative earnings in Sweden -a quantile regression approach”, *International Journal of Manpower*, 28(6), 456-473.
- Hammarstedt, M. and Shukur, G. (2006): “Immigrants’ relative earnings in Sweden -a cohort analysis”, *Labour*, 20(2), 285-323.
- Hunt, P. (2008): “Are immigrants so stuck to the floor that the ceiling is irrelevant”, Warwick Economic Research Paper No. 838.
- Instituto Nacional de Estadística (2008a): “Encuesta de Estructura Salarial 2006. Cuestionario”. Available at <http://www.ine.es/daco/daco42/salarial/cues06.pdf> [last accessed: March 10, 2009].
- Instituto Nacional de Estadística (2008b): “Encuesta de Estructura Salarial 2006. Metodología”. Available at <http://www.ine.es/metodologia/t22/t223013306.pdf> [last accessed: March 10, 2009].
- Melly, B. (2006): “Decomposition of differences in distribution using quantile regression”, *Labour Economics*, 12(4), 577-590.

- Oporto del Olmo, A. (1992): *Emigración y ahorro en España 1959-1986*, Madrid: Ministerio de Trabajo y Seguridad Social.
- Orrenious, P.M. and Zavodny, M. (2009): “Do immigrants work in riskier job?”, Working Paper No. 901, Federal Reserve Bank of Dallas.
- Phelps, E.S. (1972): “The Statistical Theory of Racism and Sexism”, *American Economic Review*, 62(4), 659-661.
- Robinson, J. V. (1933): *The Economics of Imperfect Competition*, London: MacMillan.
- Simón, H., Sanromá, E. and Ramos, E. (2008): “Labour segregation and immigrant and native-born wage distributions in Spain: an analysis using matched employer-employee data”, *Spanish Economic Review*, 10(2), 135-168.