



From guests to hosts: immigrant-native wage differentials in Spain

From guests
to hosts

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Abstract

Purpose – The purpose of this paper is to analyse immigrant-native wage differentials in Spain.

Design/methodology/approach – 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).

Findings – The paper finds that, in absolute terms, the latter component grows across the wage distribution, reflecting the existence of a kind of glass ceiling, consistent with the evidence of over-education found in previous research.

Originality/value – The paper for the first time explores earnings differentials between immigrant and Spanish workers using a nationally representative database. In addition, standard errors are computed in order to determine if the gaps are statistically significant, a task not addressed by previous works. Finally, the work is relevant as Spain has become a host country only a few years ago.

Keywords Immigration, Pay, Employees, Spain

Paper type Research paper

1. Introduction

Three decades ago Spain was a country of emigrants, with more than three million workers abroad (around 10 per cent of the total population), whose remittances financed around 10 per cent 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 per cent in 1996 to roughly 12 per cent 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



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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 full 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 Organisation for Economic Cooperation and Development (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 *et al.* (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 (ESS) 2002*, which does not offer coverage of small firms- reports similar findings for the second half of the nineties (Carrasco *et al.*, 2008; González 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 *et al.*, 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 *et al.*, 2008). From our point of view, this work has three main limitations. First, it is based on the *ESS 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* (second quarter), less than 3 per cent 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 abundant 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, 2007) and the UK (Hunt, 2008) and increases along with wages in the USA and Australia (Chiswick *et al.*, 2008).

Apart from the role of productivity endowments, several theories can explain the existence of wage differentials between locals and migrants[1]. 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, b, 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 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 might be especially relevant for the Spanish labour market, characterized by an excess of labour supply for many years[2].

The rest of the article unfolds in three parts as follows. Section 2 provides a brief description of the database used in the paper. The methodology and results of the empirical analysis are discussed in the Section 3, while the Section 4 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 *ESS 2006*, released by the Spanish National Statistics Institute on December 2008[3]. The *ESS* has several advantages over previous databases. First, 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 *ESS* 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 *ESS* is based on administrative

registers of employers, which, as Cowell (1995) points out, increases the reliability of wage data. In the second place, the *ESS* 2006 overcomes the evident limitations of the previous wave of the survey, carried out in 2002. First, the *ESS* 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 per cent 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).

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 per cent of native employees work in an enterprise whose size is ten or less, the proportion of immigrants is above 55 per cent. 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 2, 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.

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 per cent of the working population aged between 25 and 55, in the second quarter of 2006, this group accounts for more than 7 per cent of the reference group.

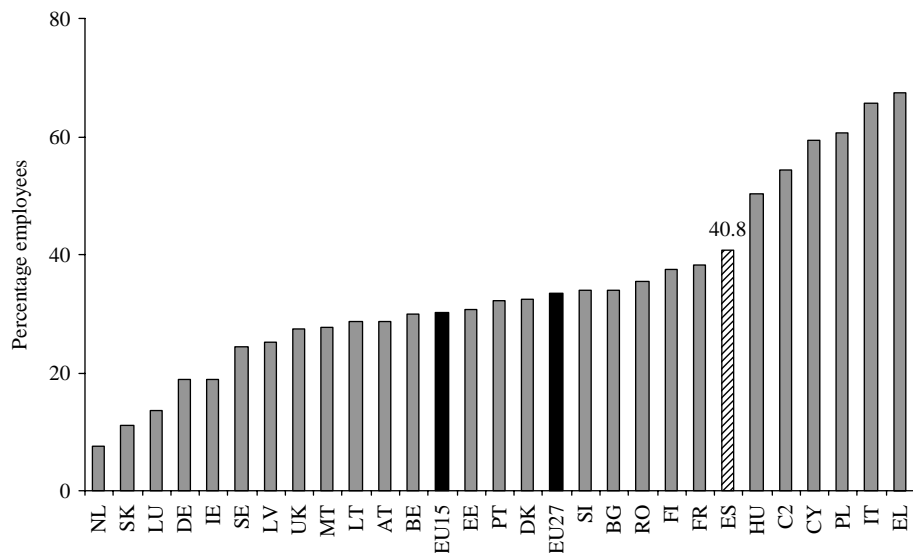
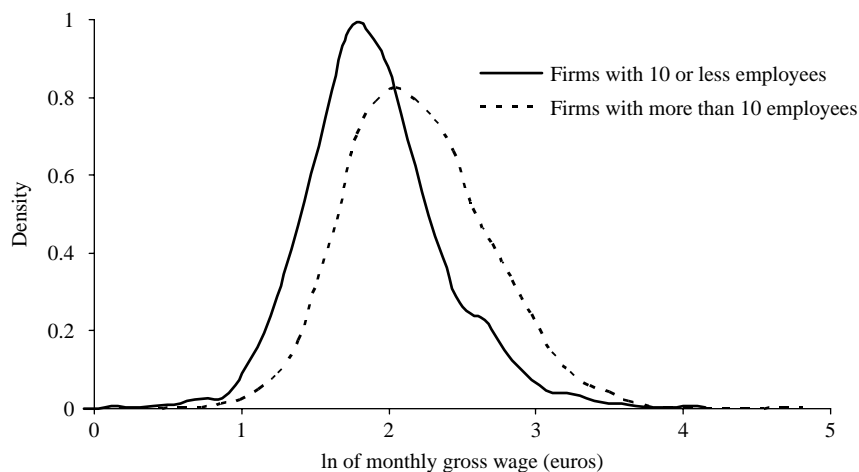


Figure 1.
Percentage of employees
working in firms with less
than ten workers
(2006-2007)

Source: Authors' analysis from 2007 observatory of European small and medium enterprises survey



Source: Authors' analysis from 2006 *SILC*

Figure 2.
Wage distributions by
firm size (2006)

It is worth mentioning that ESS 2006, though meaning 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 *ESS*, though, according to the *Spanish Labour Force Survey* they only accounted for 3 per cent 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 harder tasks or worse working conditions (Orrenius 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. This topic is likely to require a specific analysis exploring this issue and probably also offering an analysis of employment differentials using a labour force survey[4]. 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 (that is, males), we try to minimize this bias.

An additional 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 *ESS 2006*, these cases correspond to South America, European countries not belonging to 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 USA 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.

Last, it is worth mentioning the existence of an alternative database, the *Continuous Sample of Working Lives (CSWL)*, based on Spanish Social Security records. A detailed discussion on the merits and disadvantages of this data source are provided by González and Ortega (2008). The last version of this database presents several strengths, like its size and coverage. However, there are also some shortcomings that, from our point of view, make it inappropriate for our purposes. First, the coding of educational levels are taken from local registers in 1996, so there will be problems with at least individuals who did not have finished formal education by then. In addition, such schooling information is provided on a voluntary basis. Because of these facts, the Social Security Administration considers that data on educational levels in this database are not reliable (Seguridad Social, 2009). Second, there are many important job characteristics not available from the *CSWL*, among others, working hours, firm size and tenure.

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. All statistical procedures are performed using Stata 10.1.

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 *et al.* (2003) and de la Rica *et al.* (2008)[5]. 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[6]. In more detail, the procedure unfolds as follows:

- Estimate quantile regressions for the 99 percentiles (one for each percentile) using the native-born employees' dataset[7].
- For each quantile, take a draw from the locals' sample and compute the predicted logarithm of hourly gross wage for native-born employees at each quantile q , i.e. $x^{nb}(q)$. Repeat the process for the immigrants' database, calculating the predicted log-wage $x^{mb}(q)$.
Repeat step two M times and, in this way, obtain a counterfactual wage 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. Following, Albrecht *et al.* (2008) and de la Rica *et al.* (2008), M is set to 100[8].
- Profiting from the linearity of quantile regression, calculate the counterfactual gap, that is, the wage differential associated with coefficients, as $x^{mb}(q) - x^{nb}(q)$.

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 zero[9]. Two different ways have been proposed in the literature: bootstrapping or deriving an asymptotic expression for the covariance matrix (Albrecht *et al.*, 2008). To compute bootstrapped standard errors with large samples might be computationally cumbersome[10], 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 *et al.* (2008), the variance of $\theta_{mn}(q) - \theta_m(q)$ is given by:

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

This variance can be consistently estimated using the predicted quantiles $\hat{\theta}_m(q) = x^{nb}(q)$ and $\hat{\theta}_{mn}(q) = x^{mb}(q)$ – 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[11]. Note that standard errors for the difference between $\hat{\theta}_m(q)$ and $\hat{\theta}_{mn}(q)$ 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:

$$Y(q) = x\beta(q) + \varepsilon(q)$$

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

$$Quant_q(Y|X = x) = x\beta(q)$$

β 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 I. 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.

3.3. Econometric results

Selected quantile regressions (at the 10th, 25th, 50th, 75th and 90th percentiles) for Spaniards and immigrants are presented in Tables II and III, respectively. Particularly, one should highlight the remarkable differences in educational, age and tenure returns and the impact of firm size. The estimated coefficients of these variables are larger in the case of local workers, showing the existence and relevance of unexplained factors affecting hourly gross wage differentials between both groups.

	Spaniards		Immigrants	
	Mean	SD	Mean	SD
Monthly gross wage (€)	1,213	757	939	441
Weekly working hours	37.0	6.6	37.3	6.8
Hourly gross wage (€)	7.08	4.51	5.46	2.17
Age	38.48	8.42	35.04	7.29
<i>Education</i>				
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
<i>Firm size</i>				
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

Table I.
Main descriptive
statistics

Source: Authors' analysis from ESS 2006

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

Notes: Significance at *10, **5, ***1 per cent; an intercept and seventeen regional dummies are also included in all regressions
Source: Authors' analysis from ESS 2006

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

Table III.
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 (0.000)	-0.015*** (0.003)	-0.014* (0.004)
Squared age	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000* (0.000)
<i>Education (less than primary education = 0)</i>					
Primary education	0.006 (0.010)	-0.006 (0.011)	-0.007 (0.012)	0.016* (0.007)	0.008 (0.009)
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)
<i>Firm size (less than 50 employees = 0)</i>					
50-199 employees	-0.021** (0.009)	0.001 (0.009)	0.004 (0.006)	0.005 (0.006)	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^2	0.055	0.676	0.050	0.065	0.097

Notes: Significance at *10, **5 and ***1 per cent; an intercept and seventeen regional dummies are also included in all regressions
Source: Authors' analysis from ESS 2006

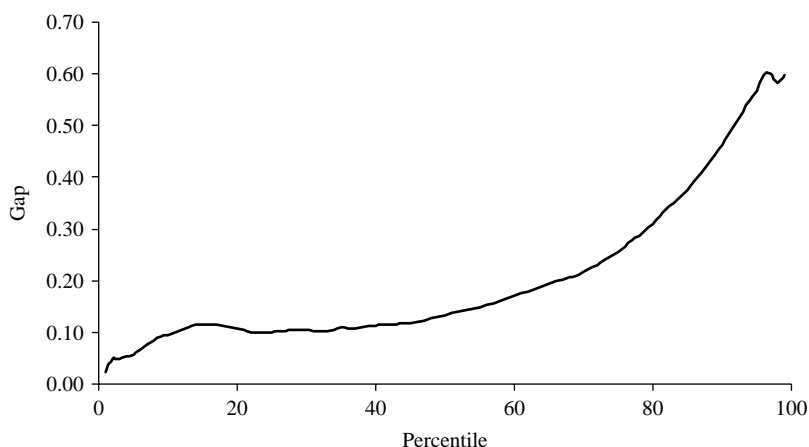
Estimates of the wage gap associated with differences in returns – that is, the component aiming to proxy for discrimination – are computed following the method described above and presented in Table IV and Figures 3 and 4. The counterfactual gap is significantly different from zero across the whole 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. First, 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

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)

Note: Significance at *10, **5 and ***1 per cent

Source: Authors' analysis from ESS 2006

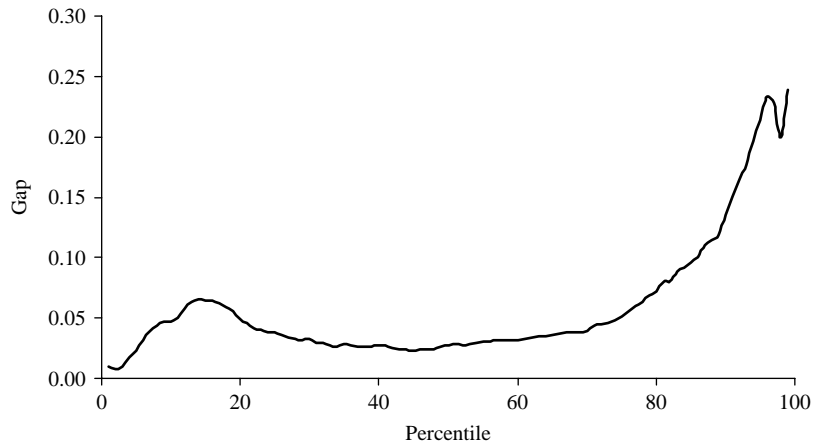
Table IV.
Estimated raw and counterfactual wage gaps by percentile between local and migrant employees (2006)



Source: Authors' analysis from EES 2006

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

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



Source: Authors' analysis from *EES* 2006

increase of the pay gap around the 20th percentile, which is not easy to interpret. A possible explanation, following the arguments of Hammarstedt and Shukur (2007) 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[12].

In order to test for the robustness of these findings, we have repeated the analysis using the logarithm of total monthly gross wages, obtaining similar results to those reported above. These results are available from the authors upon request.

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 per cent for the last wage decile.

Notes

1. See Arrow (1998) for a comprehensive and didactic review.
2. According to OECD statistics, the unemployment rate in Spain is the highest in the European Union (18.5 per cent in July 2009) and was 8.5 per cent in 2006. Furthermore, the proportion of over-qualified workers is remarkably high, as around 35 per cent of males and 40 per cent of females reported having jobs where their skills were underutilized (Budría and Moro, 2006).

3. Details on sample design and questionnaires can be found in INE (2008a, b).
4. See, for example, the works of Beach and Worswick (1993) for Canada and Shamsuddin (1998) for Canada and Husted *et al.* (2000) for the Danish case.
5. Other ways of analyzing unexplained wage gaps across the whole distribution have been proposed by DiNardo *et al.* (1996), based on semiparametric estimation methods, and Gardeazábal and Ugidos (2005) and Melly (2006) using quantile regression.
6. We evaluate the gap at natives' coefficients, as de la Rica *et al.* do when they address gender discrimination. On the contrary, Albrecht *et al.* (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.
7. We applied a slightly modified version of Machado-Mata's method, as in the original paper they take random draws from a uniform distribution on the interval [0,1]. Both approaches are equivalent in large samples (Albrecht *et al.*, 2003, 2008; de la Rica *et al.*, 2008).
8. Another reasonable approach can be to construct a counterfactual distribution whose size mimics the true distribution of immigrants (6,240 observations). We have applied this rule (which means $M = 63$) and standard errors are remarkably similar as our sample is quite large.
9. de la Rica *et al.*'s (2008) work means a remarkable exception to this trend.
10. For example, with our database, it took us more than two hours to run the model in Stata once.
11. Particularly, we use a Gaussian kernel and the optimal bandwidth suggested by Silverman (1986).
12. An interesting issue related to language proficiency is the situation of Latin American workers. At this respect, we have not found any significant difference between immigrants from this region and the rest of foreign workers, which is likely to be associated to the fact that most immigrants are employed in low-skill jobs, where language proficiency is not an important asset (Antón *et al.*, 2009).

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Further reading

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