Disadvantage and Discrimination of Immigrants in the Spanish Labour Market

Catia Nicodemo
Universitat Autònoma Barcelona

May 27, 2009

Abstract

The purpose of this paper is to analyze the differences that immigrants have in the Spanish labour market.

Immigrants in Spain come from a diversity of continents (Africa, South America, Eastern Europe, Asia, etc.), and there are substantial differences in characteristics not only among continents but also among countries in each continent.

These differences are reflected in the labour market and in particular are mirrored in the wage, so some immigrants are more discriminated that others because they have less advantage. At the same time it is possible to find discrimination between immigrants with the same origin and culture, just because the color of skin is different or because they have an advantage due to the geographical proximity to Spain. So when we study the pay gap and the gender pay gap we need to take into consideration the origin of immigrants.

We also want to study how the integration of immigrants evolved across years, if the wage gap that we find in the first episode of work between immigrants and natives disappears or continues to be present in the Spain labour market.

JEL. classification: *J16, J31, C2, C3*
Keywords: *Gender gap, quantile regression,immigration, counterfactual decomposition*

1 Introduction

Although it is explicitly prohibited by law in many countries there continue to exist many types of discrimination. Discrimination can be found between men and women, immigrants and natives, between types of contract, etc. In the year 2003 the European Union members formulated a plan to achieve a substantial reduction of gender differences in the member countries.

While many kind of discrimination has been eliminated or has decreased, the discrimination against immigrants increases every day, specially when the businesses cycle goes down.

It is normal to think that immigrants suffer discrimination but sometimes we don't consider the disadvantages that they have to leave from a situation of discrimination. These disadvantages are caused not for socials and economics reasons but for their characteristics such as nationality, skin color, religion, culture, etc.

Permanent-type of immigration of foreign nationality continued to increase, the OECD countries have experimented in 2006 an increase about 5% relative to 2005. The countries where was registered a large increase in inflow were United States, Korea and Spain.

Immigration in Spain started to grow in the middle of the year 1990 to achieve approximately 4 millions in 2007.

The immigration in Spain is quite different with respect to immigration experimented from other European countries, because in Spain we can find more than two large groups of immigrants with totally different characteristics. Most immigrants come from South America, Africa and East Europe (see graphs 1 and 2).

All these immigrants have of course different culture and characteristics from native people but their are also different among them and inside them. For example Latinos people speak the same language of natives, although they have different characteristics and this difference is also reflected among them.

We could divide the South American immigrants in two big groups: the Souther American Cone(Argentina, Chile and Uruguay) with a developed economy and the Rest of South American (Ecuador, Peru, Columbia) with a underdevelopment economy. Besides it's evident that the Latinos immigrants have an advantage with respect to African in the Spain labour market due to the similar culture and in particular the language. This advantage of Latinos push up disadvantage for African, increasing the risk of discrimination and integration, but this is not true for all African immigrants.

We need to distinguish inside the group of African immigrants people coming from Maghreb (Algeria, Morocco and Tunes) and the rest of the

African continent. Due to the geographic proximity of Maghreb to Spain their characteristics, culture and ability (such to speak Spanish)are better that the rest of African immigrants, so also in these groups we can see differences inside.

Figure 1: **Flow of Immigration**


Source: Eurostat
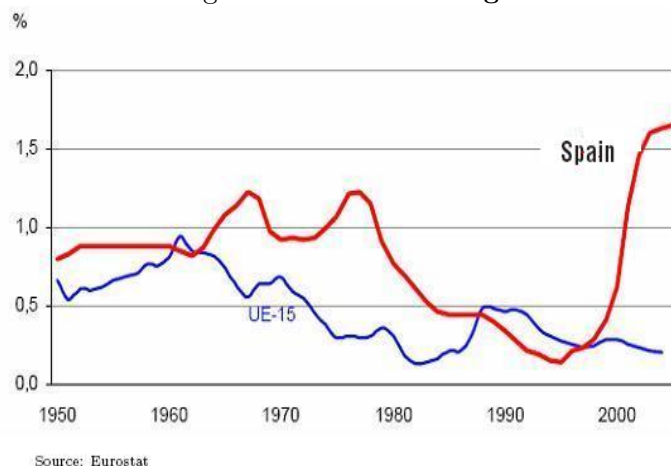
The purpose of this paper is to analyze the wage differences that immigrants from the same origin could have in the Spanish labour market, not only with respect to natives but also among them. We want to estimate how some characteristics of the country of origin give some advantages or disadvantages to immigrants and their impact on the level of discrimination and integration.

In addition, we also show how the reduction of the wage gap is considered as a measure of the assimilation of immigrants and how the discrimination between men and women evidence the presence of a glass ceiling or sticky floor effect. Usually, the literature has identified the existence of a glass ceiling when the pay gap is significantly larger at the top of the distribution and a sticky floor when the wage gap is larger at the bottom.

In recent years many papers have studied the immigration and different aspects such as discrimination, assimilation and their impact on the Spanish labour market.

Canal-Dominguez and Gutierrez (2008) using the Wage Structure Survey data and the Oaxaca-Blinder method analyzed the wage gap between immigrants and natives in Spain and found that immigrants with low wages are discriminated. They didn't distinguish for type of immigrants. Carrasco

3

Figure 2: **Change in inflows of migrants by country of origin, 1995-2005 and 2006**
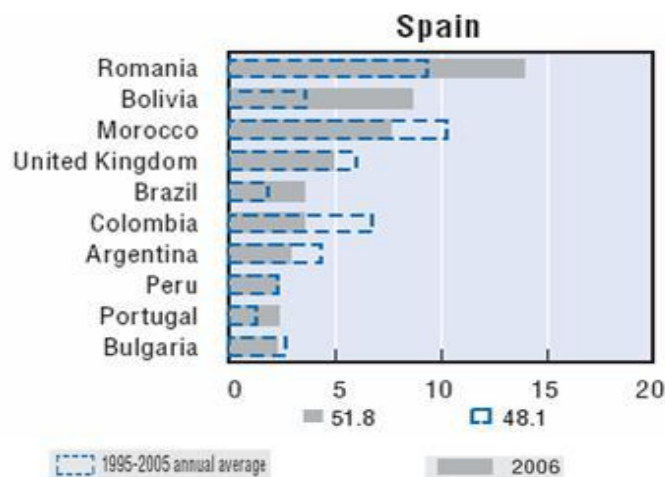
Source: OECD

et al.(2008) or Amuedo-Dorantes and De la Rica (2007b) studied the impact of immigrants in the Spanish labour market and the consequence for native workers, found a very smooth effect on native employment opportunities. Izquierdo et. all (2009) studied the assimilation of immigrants in Spain and dedued that it occurs after 5 or 6 years after the arrival. De la Rica, Dolado and Llorens (2005) using 1999 data for Spain found that the gender wage gap is expanding over the wage distribution only for the group with college/tertiary education. For less educated groups, the gender wage gap is wider at the bottom than at the top. Thus, in Spain for the better educated there is a glass ceiling while for the less educated there is not.

Exploiting the longitudinal data set on earnings in the Spanish labour market (Continuous Sample of Working Histories 2007), we carry out our analysis about discrimination and assimilation of immigrants. Using the quantile regression method is possible to analyze all the distribution of the wage gap and applying the method of Melly's decomposition we look how the wage gap between natives and immigrants and among immigrants is decomposed in two parts: one due to the difference in characteristics or explained part and another due to discrimination or unexplained part.

The paper is organized as follows. First section describes the data set and the characteristics of immigration. The second section is about the

model to calculate the decomposition. In the third section we present the results and on final section the conclusion.

2 Data and Sample Characteristics

We estimate the pay gap and the gender pay gap of immigrant workers and their assimilation in Spain using the MCVL data (Continuous Sample of Working Histories, Muestra Continua de Vidas Laborales) in year the 2007. These data represent more than 1 million of people related with the Social Security System.

The MCVL started in 2004 and workers are a random sample who are affiliated to the Social Security in the year when the survey was extracted, and reproduces the labour history of the affiliated starting from their first job. We have some problem of attrition because we don't observe workers when they go out off the labour market and because the complete information about contract and contribution sarted in year 1995.

There are other limitations: we don't know when these immigrants arrived in Spain and their total experience before entering the Spanish labour market, in addition a great part of immigrants are illegal and no information is available.

Although this limitation, the MCVL is a good database to study the labour market in Spain. Another database usually used is the EPA (Labour Force Survey). The MCVL is complementary to the EPA because it gives us more exhaustive information on the labor trajectory of workers, besides the MCVL contain information about the amount of contribution to the Social Security System, which is a good approximation at the wage of workers.

The data set gives information of all the historical relationships of any individual with the Social Security System (in terms of work and unemployment benefits). We also have information with respect to the type of contract, sector of activity, qualification and the earnings that every month an individual must pay to the Social Security System, date when entering or going out of the job market, par-time or full-time and size of firm. Moreover, it contains information on gender, nationality, residence and date of birth and level of education.

To study the discrimination this work takes into consideration immigrants who are at the first episode of their job in the Spanish labour market in the year 2007. We consider immigrants from Africa, South America and East Europe taking the birth place and not the nationality as a definition of immigrant. We consider males and females between 16 and 64 years old.

We use the hourly wage, calculated as the ratio between annual earnings divided by days worked during the year 2007 multiplied by the hours worked in one day. We eliminate observations when the daily earnings are below the minimum base or exceed the maximum base (Social Security System

6

has imposed the minimum base in 2007 around 500 euros, and maximum at 2800 euros) and we take into consideration when the worker presents more than one job, we also eliminate unemployment insurance earnings and self-employment. Females earnings present the problem of selection error due to the decision to participate or not in the labour market. We have correct this selection bias using the prediction of the inverse Mill's ratio, estimating the female participation with the ELFS (European Labour Force Survey) data set, because in the MCVL it is only present the employment but we don't have information about the participation.

To look for the assimilation of immigrants in the Spanish labour market we need to study the wage of immigrants after two or three years in the labour market. This period is necessary to estimate if immigrants have achieved more or less the same wage of natives and to estimate if the discrimination, due to disadvantages such as language for example, has decreased. To do that we study the discrimination in the year 2007 for immigrant who enter for the first time in the labour market in 2004.

Tables 1 and 2 show the distribution of immigrants by gender in the year 2007 at their first episode of work in the Spanish labour market, the group of females is lowered respect to the group of men. The average age is around 33 years old for women and men and among immigrant countries, while natives are younger. African, Latinos and East Europeans are mainly occupied in the building sector, while the great majority of women from the same countries are employed in the hotel and restaurant sector. Asian men and women are employed in the food and beverage sector also. Natives are employed in activities such as education, public administration and services. Immigrants from South America and East Europe are more educated with respect to natives, Africans and Asians. Although it is essential to remind that the information about the level of education is not updated, so the interpretation of this variable will have to be careful. Normally the immigrants work in micro firms and they contracts are temporary with respect to natives, except for Asian immigrants, because usually they are self-employed more than employee.

Table 1: **Sample Characteristics: Men**

Men	Spain	Africa	Asia	South America	Est Europe
Age	23.10	31.19	32.49	33.36	33.50
Agric.	0.01	0.04	0.00	0.02	0.04
Rest. Hotel	0.09	0.09	0.34	0.13	0.08
Bulding	0.20	0.46	0.20	0.41	0.53
Industr.	0.13	0.10	0.05	0.09	0.11
Pub. Admin.	0.04	0.01	0.00	0.00	0.00
Primary Educ.	0.60	0.66	0.58	0.29	0.38
Secondary Educ.	0.38	0.30	0.37	0.65	0.57
Tertiary Educ.	0.01	0.02	0.02	0.05	0.03
Size-micro	0.28	0.26	0.22	0.26	0.29
Size-med	0.26	0.12	0.04	0.09	0.07
Size-large	0.18	0.04	0.02	0.04	0.01
Temporary Con.	0.89	0.88	0.72	0.80	0.80
Perman. Cont	0.11	0.12	0.28	0.20	0.20
Tot obs.	**11469**	**1655**	**482**	**4835**	**1705**

Data source: MCVL, 2007, men for their first
episode in the Social Security System

Table 2: **Sample Characteristics: Women**

Women	Spain	Africa	Asia	South America	East Europe
Age	26.10	31.16	31.68	33.05	32.33
Agric.	0.00	0.02	0.00	0.01	0.01
Rest. Hotel	0.13	0.28	0.34	0.31	0.40
Bulding	0.03	0.09	0.03	0.04	0.07
Industr.	0.06	0.09	0.13	0.05	0.10
Pub. Admin.	0.06	0.02	0.00	0.01	0.00
Primary Educ.	0.51	0.63	0.46	0.25	0.31
Secondary Educ.	0.46	0.32	0.46	0.68	0.61
Tertiary Educ.	0.02	0.03	0.07	0.07	0.06
Size-micro	0.27	0.26	0.20	0.24	0.26
Size-med	0.24	0.16	0.05	0.14	0.08
Size-large	0.21	0.11	0.03	0.14	0.04
Temporary Con.	0.89	0.85	0.63	0.80	0.75
Perman. Cont	0.11	0.15	0.37	0.20	0.25
Tot obs.	**9530**	**356**	**167**	**3187**	**890**

Data source: MCVL, 2007, women for their
first episode in the Social Security System

3 Quantile regression and wage decomposition

In recent years a new literature has estimated the gender pay gap based on the quantile regression, by looking at the effects of gender and other covariates on different quantiles of log wage distribution and not only at the average of variables.

Koenker-Basset (1978) proposed a complete new and different method of calculating the quantile regression that can be estimated by minimizing in $\beta(\tau)$ the following expression:

$$\widehat{\beta}(\tau) = min \; n^{-1} \left[\sum_i^n \rho_\tau (Y_i - X_i\beta) \right], \; (i = 1, ...n),$$

with the check function ρ_τ weighting the residuals μ_i asymmetrically:

$$\rho_\tau(\mu_i) = \begin{cases} \tau\mu_i & if \; \mu_i \geq 0, \\ (\tau - 1)\mu_i & if \; \mu_i < 0. \end{cases}$$

Starting from the study of Koenker-Basset (1978), Machado and Mata (M-M) in 2005 proposed a method to extend the traditional Oaxaca-Blinder decomposition based on the quantile regression. Considering two groups, 0 and 1, whose stochastic characteristics for each group are X_0 and X_1, the regression quantile can be written for each group as:

$$Q_y(Y|X) = X_i\beta(\tau) \qquad\qquad \forall \tau, i \in (0,1) \qquad\qquad (1)$$

where $Y|X$ is the conditional quantile. M-M propose an estimation of the counterfactual unconditional wage distribution, generate a random sample of size m from a uniform distribution $U[0,1]$, and then calculate the conditional quantile regression for each group. They simulate the wage distribution of the second group on the basis of the wage distribution and the characteristics of the first group, and repeat these steps m times.

The difference of the unconditional quantiles between the two groups can be decomposed as:

$$\widehat{F}_{Y1}^{-1}(\theta|T=1) - \widehat{F}_{Y0}^{-1}(\theta|T=0) = \underbrace{\widehat{F}_{Y1}^{-1}(\theta|T=1) - \widehat{F}_{Y1}^{-1}(\theta|T=0)}_{Characteristics}$$

$$+ \underbrace{\widehat{F}_{Y1}^{-1}(\theta|T=0) - \widehat{F}_{Y0}^{-1}(\theta|T=0)}_{Coefficients}$$

where $\widehat{F}_{Yt}^{-1}(\theta|T=t)$ denotes the θth quantile of wage Y for groups t's while $\widehat{F}_{Y1}^{-1}(\theta|T=0)$ is the counterfactual unconditional wage distribution.

Normally it is easy to estimate the conditional distribution function by inverting the conditional quantile function. However, the estimated conditional quantile function is not necessarily monotonic and so it may not be easy to invert it.

Melly in 2006 proposed integrating the conditional distributions over the range of covariates in order to obtain an estimate of the unconditional distribution. Melly showed that if the number of steps m repeated in M-M goes to infinity the procedure of the decomposition is the same as M-M when both the sample size and the number of quantiles are sufficiently large. Melly first estimates the conditional distribution of Y_t:

$$F_{yt}(q|X_i) = \int_0^1 1(F_{yt}^{-1}(\tau|X_i) \leq q) = \int_0^1 1(X_i\widehat{\beta}_t(\tau) \leq q)d\tau \qquad (2)$$

An estimator of the conditional distribution of Y_t given X_i at q is:

$$\widehat{F_{yt}}(q|X_i) = \int_0^1 1(X_i\widehat{\beta}_t(\tau) \leq q)d\tau = \sum_{j=1}^n (\tau_j - \tau_{j-1})1(X_i\widehat{\beta}_t(\tau) \leq q) \qquad (3)$$

This implies that the unconditional distribution function can be written as:

$$\widehat{F_{yt}}(q|T = t) = \frac{1}{n_t} \sum \widehat{F_{yt}}(q|X_i) \qquad (4)$$

The unconditional and counterfactual quantiles distribution are respectively:

$$\widehat{q_t}(\theta) = inf\{q : \frac{1}{n_t} \sum_t \widehat{F_{yt}}(q|X_i) \geq \theta\} \qquad (5)$$

$$\widehat{q_{c1}}(\theta) = inf\{q : \frac{1}{n_t} \sum_0 \widehat{F_{yt}}(q|X_i) \geq \theta\} \qquad (6)$$

The decomposition of the difference between the θth quantile of the unconditional distribution of two groups is:

$$\widehat{q_1}(\theta) - \widehat{q_0}(\theta) = \underbrace{\widehat{q_1}(\theta) - \widehat{q_{c1}}(\theta)}_{characteristics} + \underbrace{\widehat{q_{c1}}(\theta) - \widehat{q_0}(\theta)}_{coefficients} \qquad (7)$$

Selection bias is present when the outcome of interest is only observable for a sub-sample of individuals. Heckman in 1974 and 1979 proposed a parametric estimator to estimate covariates with selection bias. This approach is inconsistent if the error term is misspecified. Powell (1987)and Newey (1991) proposed a semi-parametric estimator for the sample selection model. More recently Das, Newey and Vella (2003) proposed a nonparametric estimator for this model. Buchinsky in 1998 and 2001 was the first to apply the semi-parametric sample selection model for quantile regression.

Concerning the selection in the wage equation of women, we follow the Buchinsky (1998a) estimation. We calculate the quantile regression of women as:

$$Q_y(Y_w|X) = X\beta_w(\tau) + h_\tau(z_w\gamma) \quad \forall \tau \in (0,1) \tag{8}$$

The vector Z is a set of observable characteristics that influence the probability that a woman participates in the labor market. These variables are uncorrelated with the log of the wage and they are: dummy for children with different ages, education, age, age square.

The term $h_\tau(z_w\gamma)$ correct the selection at θ^{th} quantile. It represents the inverse Mill's ratio in the Heckman method. To estimate this term Buchinsky (1998a) suggests a series of estimators, we consider this one:

$$h_\tau(z_w\gamma) = \imath\delta_0(\tau) + \delta_1(\tau)\lambda(z_w\gamma) + \delta_2(\tau)\lambda(z_w)^2 \tag{9}$$

The asymptotic distribution of $\beta(\tau)$ for a given quantile τ is a non iid setting. We calculate the asymptotic variance of $\sqrt{nX_i}\widehat{\beta}_t(\tau_j)$ using the "Hendricks-Koenker sandwich" following Hendricks and Koenker (1992), Koenker (2005), and Melly (2006), and we correct the standard error with a bootstrap estimation for 100 times.

4 Empirical Results of Quantile Regression

According to the methodology of quantile regression in this we report section the different results about discrimination and assimilation of immigrants.

First, we estimate the wage gap among immigrants, after we study the difference in wage between immigrants and native and at the end the distribution of the wage gap between women and men, analyzing the sticky floor or glass ceiling that women suffer with respect to men.

The variables that we use are: age, type of occupation, level of education, qualification, size of firm, permanent or temporary contract and community of residence.

Figure 3 shows the distribution of the hourly wage gap (*overall*) divided in two components: *discrimination* or *coefficients* effect and *characteristics* or *explained* effect.

As we have told before one of the objectives of this paper is to estimate the discrimination among immigrants in the host labour market, when they have the same characteristics such as culture, language, nationality etc, so in figure 1 we report the discrimination that we find when we analyze the difference in wage between immigrants from the same continent when they enter the Spanish labour market for the first time in 2007,.

We analyze men immigrants and we report Argentina versus Ecuador and Peru, Bulgaria against Romania and Morocco versus Rest of Africa.

We find a positive grade of discrimination , i.e., the unexplained part is positive and explains a great part of the wage gap, while the effect due to characteristics is much weakened across the distribution and in particular at the beginning, and the amount of discrimination varies along the distribution. In general the discrimination goes up until the percentile 40, goes down very fast between percentiles 40-60, and after that it continues to be positive and constant across the distribution.

The "*characteristic effect*" or "*explained effect*" is positive especially at the end of the distribution. Although countries such as Morocco versus Rest of Africa and Argentina versus Peru have a positive and big difference in characteristics or explained effect, the first ones at the beginning of the distribution and the second ones at the end of the distribution. This evidences that immigrants who also have same characteristics, because they come from same continent, in are discriminated in the Spanish labour market . While for Southern Americans we know that they speak the language of natives and we can think that the wage gap inside them is due to discrimination (different skin color), for Africans and Marocain is different, because part of wage gap inside them is due to proximity to Spain that Marocain have with respect to the Rest of African, which gives them more advantages.

In graph 4 we report the wage gap distribution between Spanish people and immigrants who enter the job market for the first time in 2007. We can

Figure 3: **Differences between Immigrants**
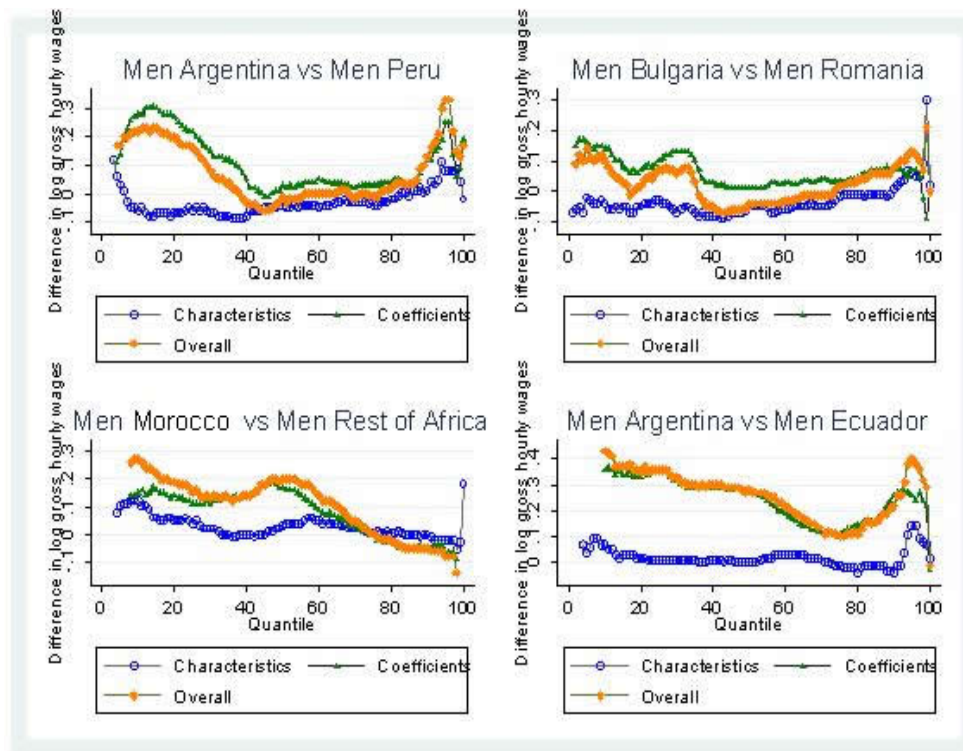
see how the wage gap is positive across all percentiles. The component due
to the discrimination is higher at the bottom of the wage distribution where
the characteristics effect is negative. A negative percentage value implies
that immigrants have better characteristics than natives which compensates
them for discrimination. At the top of the wage distribution a great part of
the wage gap is due to natives having more human capital, better occupation
and so they are more productive than immigrants.

In the next figure (5) we show the wage gap calculated between Spanish
versus African and Spanish versus South American.

The composition of the characteristics effect and coefficients effect is
different in these two immigration countries. First of all the wage gap is less
for Latinos than Africans. At the bottom of the wage distribution both suffer
discrimination but for Souther Americans the wage gap decreases faster with
respect to African. Concerning the characteristics effect, African have less
characteristics than Spanish, while the characteristics effect of Latinos with
respect to natives is negative and positive only at the end of the distribution.

13
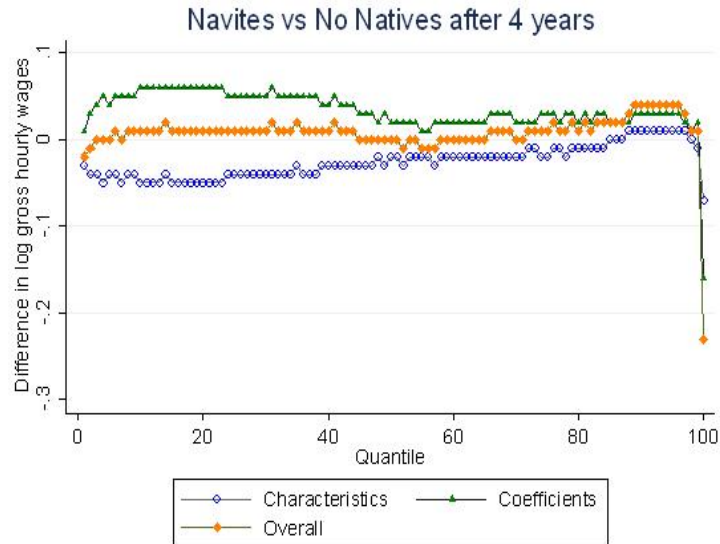
Figure 4: **Quantile regression decomposition**

Natives vs Non-Natives

Figure 5: **Quantile regression decomposition**

14

Figure 6: **Quantile regression decomposition**
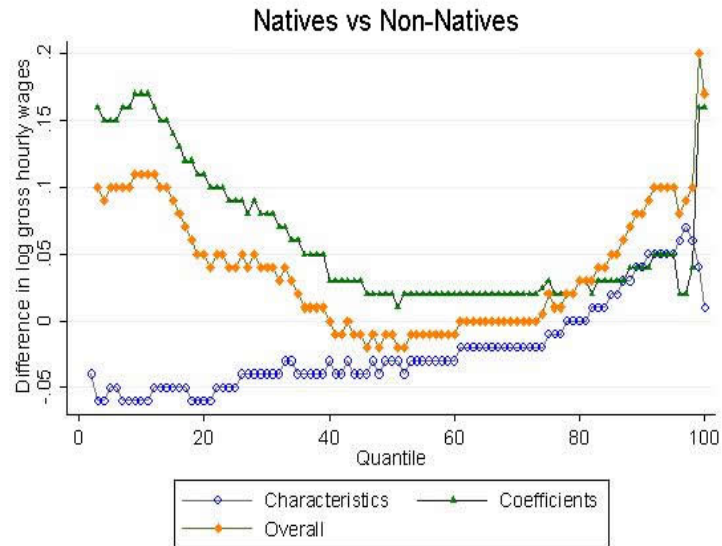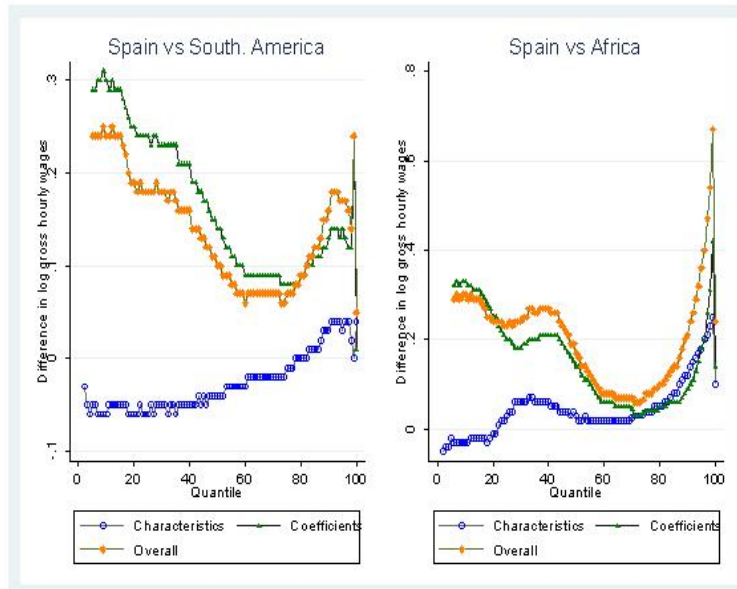
Data source: MCVL, 2007

Figure 6 refers to the study of the wage gap 4 year after immigrants
enter the Spanish job market (2003). We have analyzed that because after
this period normally immigrants are more integrated in the society, knowing
better the culture, language and characteristics of natives so they tend to
internalize them.

We can see how the wage gap decreases, in particular at the bottom of
the wage gap distribution. Besides, the characteristics effect continues to be
negative at the bottom but is reduced a lot at the top.

Usually, the literature has identified the existence of a glass ceiling when
the pay gap is significantly larger at the top of the distribution and a sticky
floor when the wage gap is larger at the bottom. We define the existence of
a glass ceiling if the 95th percentile wage gap is higher than 2% with respect
to the 50th percentile, while the sticky floor effect exists if the 10th percentile
wage gap is higher than the 25th percentile by at least 2%.

In graph 7 we can see the discrimination effect between genders in the
Spanish labour market for natives or Souther Americans.

The wage gap is different in these two groups. Women in the native
country have negative characteristics, so as we have told before they need
better characteristics than men to compensate the discrimination, while the
characteristic effect across the wage gap distribution of South America is
around zero and is positive at the top and the bottom of the distribution,

15

Figure 7: **Quantile regression decomposition**
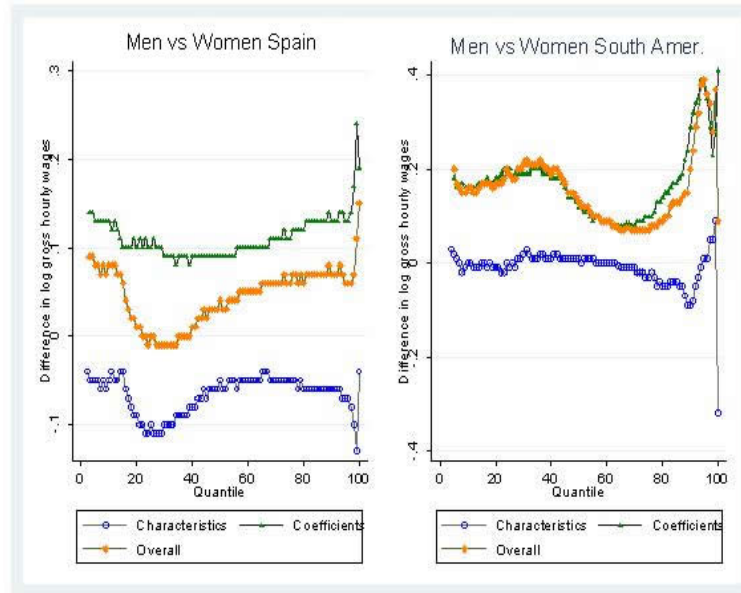
meaning that men Latinos are more better educated or have a better job. The discrimination effect is positive and both groups suffer of the sticky flor and the glass ceiling effect, but Latinos women are more discriminated and effects are stronger with respect to Spanish women. To promote Latinos women to higher responsibility job is unlikely such as most women are segregated in low skills jobs.

5 Conclusion

By applying the quantile regression procedure, we understand the different wage gap between immigrants and between immigrants and natives along their wage distribution. Is evident that the Spanish have better opportunities and so the wage gap at the top of the distribution is due to that and not a discrimination.

The wage pay gap is positive when we analyze the earnings of immigrants, and most of it is made up of the discrimination effect, while the characteristics effect is near zero and substantially the same between immigrants and natives specially at the bottom of the distribution. Immigrants with low a wage are more discriminated with respect to natives.

Africans are more discriminated in comparison to Latinos although the last have better characteristics. This makes us think that because African are less language skilled with respect to South American when they enter for the first time in the Spanish labour market, African are discriminated, so maybe they need an integration language program when they arrive. This could help immigrants eliminate the language disadvantage and reduce their discrimination and integration. This has been proofed when we analyze the Marocain and the Rest of Africans, because the first have better characteristics and are less discriminated.

It is important to take into consideration the origin of the immigrants when we want to study the wage in the Spanish labour market, because their discrimination and the wage gap is different, not only between natives and no natives, but also between immigrants that come from same continents with same culture.

The assimilation and integration of immigrants is possible, also if it takes a long period. Policies that help integrate people faster are needed. Policies based on the possibility to increase abilities such as the language or based in the elimination of segregation of immigrants in some types of work are necessary to decrease the disadvantage that immigrants find in the host country.

The gender pay gap is present not only for the native women but also for immigrant women. Of course the glass ceiling or the sticky floor effect are more evident between immigrants than between natives. It is evident that discrimination affects more immigrant women than immigrant men, in addition this kind of discrimination exists between the groups of immigrants before arriving to host country.

6 References

Albrecht Aico van Vuuren Susan Vroman, 2003. Quantile regression with sample selection: Estimating women's return to education in the U.S.

Amuedo-Dorantes, S. de la Rica (2007b). Labour Market assimilation of recent immigrants in Spain, Iza.

Beblo, M., D. Beninger, A. Heinze and F. Laisney, 2003. Measuring Selectivity- Corrected Gender Wage Gap in EU. ZEW Mannheim, discussion paper No. 03 74.

Becker, G. 197). The Economics of Discrimination. Series: (ERS) Economic Research Studies.

Blinder, A. S. 1973. Wage Discrimination: Reduced Form and Structural Estimates, The Journal of Human Resources, 8(4), 436-455.

Chamberlain, G., 1980. Analysis with qualitative data, Review of Economic Studies 47, 225-238.

Blau F. D. and L. M. Khan, 1996. Wage structure and Gender Earnings Differentials: An international comparison, Economica 63.

Blau F. D. and L. M. Khan, 2003. "Gender Differences in Pay," NBER Working Papers 7732, National Bureau of Economic Research.

Buchinsky, M. (1998a). The Dynamics of Change in the Female Wage Distribution in the USA: A Quantile Regression Approach.Journal of Applied Econometrics 13; 1-30.

Buchinsky, M. 1998b. Recent Advances in Quantile Regression Models. Journal of Human Resources 33; 88-126.

Canal J., Rodriguez C. Analysis of wage differences between native and immigrant workers in Spain. Spanish Economic Review, 2008.

Carrasco et all. El efecto de la inmigracion en las oportunidad de empleo de los trabajadores nacionales: evidencia para Espaã. Fundacion BBVA, 2006.

De la Rica S., J. Dolado , V. LLorens, 2005. "Ceilings and Floors?: Gender Wage Gaps by Education in Spain," DFAEII Working Papers 200501

Employment in Europe 2005. Brussels: European Commission.

García J., P. Hernandez and A. Lopez-Nicolas. 2001. How Wide is the Gap? An Investigation of Gender Wage Differences Using Quantile Regression. Empirical Economics. March, 26:1, pp. 14967.

Heckman, James J. 1979. Sample Selection Bias as a Specification Error. Econometrica. January, 47:1, pp. 15361.

Hendricks, Wallace and Roger Koenker. 1992. Hierarchical Spline Models for Conditional Quantiles and the Demand for Electricity. Journal of the American Statistical Association. March, 87:417, pp. 5868.

Koenker, Roger and Gilbert Bassett. 1978. Regression Quantiles. Econometrica. January, 46:1, pp. 3350.

Joshi, H. and P. Paci (1998). Unequal Pay for Women and Men. London: The MIT Press Cambridge.

Izquierdo et all. (2009). Assimilation of immigrants in Spain: a longitudinal analysis. Bank of Spain.

Machado, J., and J. Mata (2003), Counterfactual Decomposition of Changes in Wage Distribution Using Quantile Regression, mimeo, Universidade de Lisboa.

Melly B. 2006, Estimation of counterfactual distributions using quantile regression, Review of Labor Economics 68, 543-572.

Miller, P. W. (1987), Gender Differences in Observed and Offered Wages in Canada, 1980, The Canadian Journal of Economics, 20 (2), 225-24.

Miller, P. W. Rummery S. (1991) Male-Female Wage Differentials in Australia: A Reassessment, Australian Economic Papers

Mincer, J. (1974), Investment in Human Capital and Personal Income Distribution, Journal of Political Economy, 66(4), 281-302.

C. Nicoletti and F. Peracchi 2002: A cross-country comparison of survey participation in the ECHP, Working papers of the. Institute for Social and Economic Research.

Plasman R. and S. Sissoko, 2002. National Reports on the Unadjusted and Adjusted Gender Pay Gap in Belgium. European Expert Group on Gender and Employment Report to the Equal Opportunities Unit, DG Employment.

Oaxaca R. L. and M. Ransom, 1998. Calculation of approximate variance for wage decomposition differentials. Journal of Economic and Social Measurement 24, 55-61.

Oaxaca R., 1973. Male-Female Wage Differentials in Urban Labor Markets. International Economic Review 14, 693-709.

Rice, P. (1999), Gender Earnings Differentials: The European Experience, The World Bank Development Research Group, WP No.8.

Sissoko et al. (2006), Does unobserved Heterogeneity Matter? A Panel Data Analysis of the Gender Pay Gap, working paper 2006.

Wooldridge, J.M., 2002, Econometric analysis of cross section and panel data. MIT Press: Cambridge, MA. 33