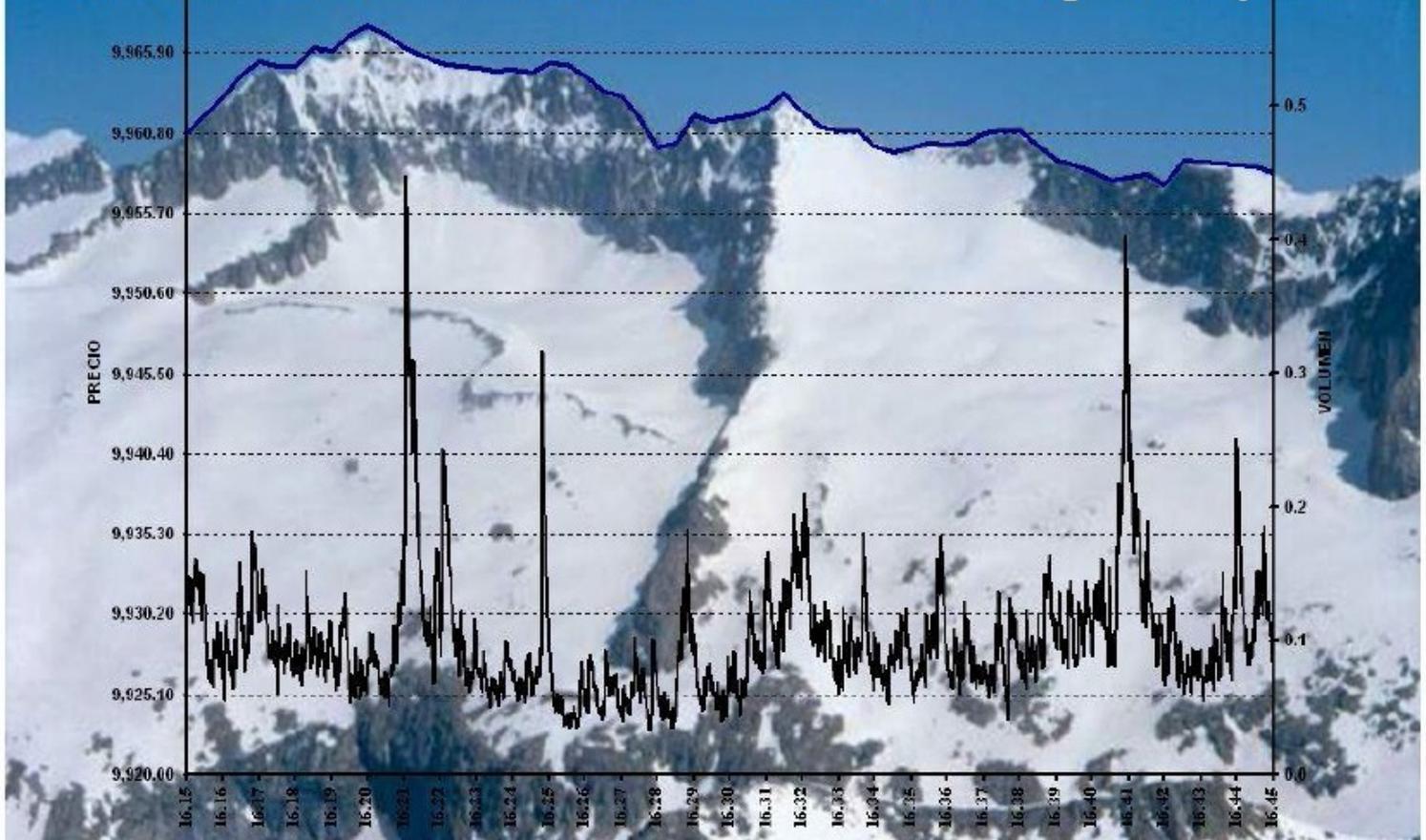


Economics, Finance and Mathematics from a high standpoint



Gender Differences in the Spanish Labor Market: a Review Before and After the Economic Crisis

Luz M^a Peña Langobardo

University of de Castilla – La Mancha, Spain

Antonio Fernández-Bolaños

University of de Castilla – La Mancha, Spain

Santiago Pérez-Camarero

University of de Castilla – La Mancha, Spain

Alvaro Hidalgo Vega

University of de Castilla – La Mancha, Spain

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Autores:

Luz María Peña

Antonio Fernández-Bolaños

Santiago Pérez-Camarero

Álvaro Hidalgo

Edita:

Departamento de Análisis Económico y Finanzas de la UCLM

Teléfono: 34 967 599 200. Extensión 2143

<http://www.uclm.es/dep/daef/>

Depósito Legal: AB-351-2009

ISSN: 1989-4856

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Gender Differences in the Spanish Labor Market: a Review Before and After the Economic Crisis

Peña-Longobardo, L.M.¹, Fernández-Bolaños, A.², Pérez-Camarero, S.³, Hidalgo-Vega, A.⁴

ABSTRACT: The main aim of this study was to analyze whether the discrimination rate between males and females has increased or decreased over the last decade in Spain, and to determine whether it has been influenced by the economic growth prior to 2007, as well as by the economic crisis after. Data from the Salary Structure Survey was used to obtain information related to the labor market in Spain from 1995 to 2010. Moreover, alternative methods for estimating the extent of labor market discrimination were used. All of the methods involved the decomposition of the differences in gross wage into both discrimination and productivity components. Additionally, a logistic regression was performed to analyze the main factors that explained the probability of being discriminated in Spain. Although the discrimination rate decreased over the analyzed period (especially during the first years of the economic expansion (1995-2002)), there was still a discrimination rate of 0.05 between males and females. Therefore, policies need to be adopted to combat this discrimination and take advantage of the adaptation.

¹ Corresponding author: Luz María Peña-Longobardo; faculty of Law and Social Sciences, Department of Economic Analysis and Finances, University of Castilla La-Mancha, Cobertizo San Pedro Martir s/n, 45071 Toledo, Spain; email: LuzMaria.Pena@uclm.es. Tlf: (+34) 925265741

² A. Fernández-Bolaños; faculty of Law and Social Sciences, Department of Economic Analysis and Finances, University of Castilla La-Mancha, Cobertizo San Pedro Martir s/n, 45071 Toledo, Spain; email:

³ S. Pérez-Camarero; faculty of Law and Social Sciences, Department of Economic Analysis and Finances, University of Castilla La-Mancha, Cobertizo San Pedro Martir s/n, 45071 Toledo, Spain; email:

⁴ A. Hidalgo-Vega; faculty of Law and Social Sciences, Department of Economic Analysis and Finances, University of Castilla La-Mancha, Cobertizo San Pedro Martir s/n, 45071 Toledo, Spain; email:

KEYWORDS: discrimination rate, wage, labor market, wage gap, salary

INTRODUCTION

The increasing participation of females in the labor market over the past few decades is a characteristic of Spain. Yet, in the Spanish labor market, females are still discriminated against in many ways, such as having less access to management positions (only 30.8% of the total management jobs in 2014 were females⁵), higher unemployment rates (24.7% for females, 22.8% for males), and lower activity rates (53.9% compared to 65.9% for males⁶). However, the economic and financial crisis have approached both the unemployment rate (Mingorance-Arnáiz and Olmedo 2015) and the activity rate between males and females. More precisely, on average in 2006, the activity rate for females and males was 48.4% and 69.2%, whereas the unemployment rate was 11.3% and 6.3%, respectively.

Additionally, governments in these countries (including Spain) have implemented policies and laws to increase the integration of females in the labor market, causing a lower discrimination of females (in terms of wages and general conditions). Overall, these measures have been positive and allowed for better integration for females. However, the achievement of a status of no discrimination is still far away and, therefore, further steps should be taken in this direction.

Studies about gender differences in wages reached a milestone in Becker's (Becker 1957) work. Since then, many authors have researched this subject. A summary of the findings can be found in several studies (Blau and Kahn 2000; Weichselbaumer and Winter-Ebmer 2005; Weichselbaumer and Winter-Ebmer 2007). The main result suggested that, although gender wage differences and discrimination still exist, they have been reduced over the last decades and, at the same time, it is getting closer among industrialized countries. In fact, economies

⁵ Data from EPA, INE (National Institute of Statistics).

⁶ Unemployment and activity rates data from EPA, INE (National Institute of Statistics), 2014 fourth term.

with more competitive markets and legal frameworks for improving gender equality had the lowest gender discrimination rates (Weichselbaumer and Winter-Ebmer, 2005).

A review of recent studies (Plasman and Sissoko 2005; Suh 2010; Diaz and Sanchez 2011; Hedija and Musil 2011; Sulis 2011; Fransen, Plantenga et al. 2012; Bartolucci 2013) on this subject in the European Union suggested that, despite the characteristics and productivities of males and females approaching over the last few years, there is still a gender gap that, at the least, can be explained through gender discrimination. On the other hand, this gender discrimination has been decreasing recently. The percentage of gender discrimination in wages may vary between 6% and 19.5%, depending on the methodology, assumptions, and country in each case.

Likewise, the gender gap seemed to be stable during the life cycle (Weinberger 2011), which may indicate that the causes of the gender gap have been present since the beginning of the working life. Although most studies have found that the gender gap exists, but is diminishing, a study in Belgium (Vandenberghe 2011) found that there is no gender gap in the Belgian private sector, according to data provided by firms and employees in that country.

Moreover, even though there are several studies that have analyzed the discrimination rates among females and males, there is no evidence about the evolution of such rates over the last two decades (before and after the economic crisis) in Spain. Therefore, our main aim is to analyze gender wage discrimination in Spain from 1995 to 2010. As we have had some years with very strong economic growth (from the 1990s to 2007) followed by a very severe crisis (from 2007 until now), we are able to analyze how the gender gap and wage discrimination have been affected by these different economic situations. Thereby, we investigate how the different wage determinants influenced this gender gap; prior, we would analyze what part of the wage gap was due to objective factors (such as different productivities, education levels

and so on), and what part of the wage gap was caused by discrimination (the remainder that cannot be explained through objective factors). Further, we estimate the main factors that may influence discrimination in Spain.

DATA AND METHODS

We used data from the Wage Structure Survey by the Spanish National Statistics Institute through the period 1995-2010. The sample includes information on 844,000 individuals in the analyzed period. The main objective of this survey is to ascertain gross annual earnings, classified by different characteristics of the worker, such as sex, occupation, economic activity, age, etc. The population scope is made up of all those workers who work for others, provide their services in contribution centers, and have been affiliated with Social Security for more than two months of the year, including October. The companies included are those with more than 50 workers.

First, we must define precisely what gender discrimination is, as the mere difference in wages between males and females does not imply the existence of discriminatory behaviors. Gender gaps may originate because of the division of labor within the family (Bartolucci 2013). As such, females will have lower incomes if they decide to play a more active role at home, taking more part-time jobs or spending less time and money in job training. This behavior causes lower incomes, independent of whether economic discrimination exists. That is why, according to Cain's point of view, we may define discrimination as the existence of permanent differences in wages between males and females that are non-attributable to differences in labor productivities or the voluntary sharing of housework (Zafar 2013).

However, this inefficiency might be caused by a higher or lower retribution of productivity, not being equivalent from a theoretical point of view. In the first case, there is favoritism toward

one group, which we define as nepotism (Goldberg 1982); whereas in the second, we found a damage, properly known as discrimination (Cain 1991).

Therefore, in the absence of discrimination, we can say that the ratio of wages between two groups (males and females) should be equal to their respective labor productivities (Becker 1957):

$$\frac{W_h^0}{W_m^0} = \frac{Pmg_h}{Pmg_m} \quad (1)$$

where W is the real wage, Pmg the marginal productivity of labor (h for males and m for females). If no wage discrimination exists, Equation (1) should be valid.

When the above condition is not fulfilled, some kind of discriminatory behavior occurs. In this case, we can measure this discrimination using the Oaxaca and Blinder decomposition method. We will presume that the favored group is males, whereas the damaged one is females (Blinder 1973; Oaxaca 1973). In these terms, we define the gross wage differential as follows:

$$G_{hm} = \frac{W_h}{W_m} - 1 \quad (2)$$

where W_h is the males' wage and W_m is the females'. As we have mentioned, with no discrimination, wage gaps should reflect just the differences in labor productivities (Q_{hm}):

$$Q_{hm} = \frac{W_h^0}{W_m^0} - 1 \quad (3)$$

where W^0 is the wage with no discrimination. Then, taking into account both equations, we can define the discrimination coefficient (D_{hm}) as the rate of change of ($G_{hm} + 1$) to ($Q_{hm} + 1$):

$$D_{hm} = \frac{(W_h / W_m - W_h^0 / W_m^0)}{(W_h^0 / W_m^0)} \quad (4)$$

The discrimination coefficient explains what percentage of the wage difference is because of discrimination. That is why we can use Equations (2) through (4) in order to decompose the logarithm of the observed ratio of wages into two parts:

$$\text{Ln}(G_{hm} + 1) = \text{Ln}(D_{hm} + 1) + \text{Ln}(Q_{hm} + 1) \quad (5)$$

Therefore, the wage difference observed in the labor market is the result of both the differences in productivity of the two groups and discriminatory component. However, in Equation (5), the discrimination coefficient only reports the percentage of such differences due to discrimination, without specifying what part of this percentage stems from favoritism for males or from discrimination against females. To clarify these effects, we can separate the coefficient into two components:

$$\begin{aligned} \text{Ln}(D_{hm} + 1) &= \text{Ln}(W_h / W_m) - \text{Ln}(W_h^0 / W_m^0) \\ &= \text{Ln}(W_h / W_h^0) + \text{Ln}(W_m^0 / W_m) \\ &= \text{Ln}(\delta_{ho} + 1) + \text{Ln}(\delta_{om} + 1) \end{aligned} \quad (6)$$

where $\delta_{ho} = W_h / W_h^0 - 1$ is the difference between the wages earned by males and such wages males should receive in the absence of nepotism, whereas $\delta_{om} = W_m^0 / W_m - 1$ is the difference between the salary that females should receive in the absence of discrimination and that they actually perceive.

Substituting Equation (6) into Equation (5), we get a decomposition of the gross salary differences. It provides us, in detail, how much of the wage gap is due to the better consideration of males and how much of the wage gap is produced by the worse treatment of females:

$$\text{Ln}(G_{hm} + 1) = \text{Ln}(\delta_{ho} + 1) + \text{Ln}(\delta_{om} + 1) + \text{Ln}(Q_{hm} + 1) \quad (7)$$

Once the decomposition is made, we should explain the method applied to quantify these concepts. We estimated earnings equations separately for males and females, with the following values:

$$Ln(\tilde{W}_h) = \bar{X}'_h \hat{\beta}_h \quad (8)$$

$$Ln(\tilde{W}_m) = \bar{X}'_m \hat{\beta}_m \quad (9)$$

where \tilde{W} is the geometric mean of wages⁷, \bar{X} is the vector of means of the explanatory variables, and $\hat{\beta}$ is the vector of estimated coefficients. Using Equations (8) and (9), wage differences are set out as follows:

$$\begin{aligned} Ln(G_{hm} + 1) &= Ln(\tilde{W}_h / \tilde{W}_m) \\ &= Ln(\tilde{W}_h) - Ln(\tilde{W}_m) \\ &= \bar{X}'_h \hat{\beta}_h - \bar{X}'_m \hat{\beta}_m \end{aligned} \quad (10)$$

Once the wage differentials have been estimated, we can also estimate their decomposition, contained in Equation (7), by:

$$Ln(G_{hm} + 1) = \bar{X}'_h (\hat{\beta}_h - \beta^0) + \bar{X}'_m (\beta^0 - \hat{\beta}_m) + (\bar{X}'_h - \bar{X}'_m) \beta^0 \quad (11)$$

where β^0 is the estimate of the coefficients when there is no wage discrimination. Comparing Equation (11) with (7), we would say that the first term reflects nepotism for males, the second reflects discrimination against females, and the third reflects the differences in labor productivity between the two groups.

As shown in Equations (11) and (7), the essential assumption to quantify wage discrimination is to identify what the real wage structure is in the absence of discrimination, that is, what the

⁷ That is, to say: $\tilde{W} = \exp \left\{ \left[\sum_{i=1}^n \ln(W_i) \right] / n \right\}$.

value of β^0 is. Further, the parameter value is given by the following equation (Oaxaca and Ransom 1994):

$$\beta^0 = \Omega \hat{\beta}_h + (I - \Omega) \hat{\beta}_m \quad (12)$$

where Ω is the weighting matrix. It is clear that, given $\hat{\beta}_h$ and $\hat{\beta}_m$, any assumption about the vector of coefficients β^0 is reduced to give a specific definition to the Ω matrix.

For example, if the nondiscriminatory wage structure corresponds to females, its value would be $\Omega = 0$, whereas if it corresponds to males, $\Omega = I$. These two assumptions about the weighting matrix are made by Oaxaca and Blinder (Blinder 1973; Oaxaca 1973), as well as by many others in numerous studies based on those articles. However, subsequent studies suggested various other weights, for instance, Reimers, who chose $\Omega_r = (0,5)I$ (Grove, Hussey et al. 2011), or Cotton (Cotton 1988), who proposed a matrix $\Omega_c = I_{gm} * I$, where I_{gm} is the proportion that represents the largest group in the sample.

Thus, there seems to be a disagreement on which weight matrix should be used. Neumark (Neumark 1988) showed that, in order to get the value of the weighting matrix Ω , the pooled sample of males and females may be estimated by Ordinary Least Squares (OLS). Then, the coefficients vector β^0 would be estimated as follows:

$$\hat{\beta} = (X'X)^{-1}X'Y = \beta^0 \quad (13)$$

where X is the matrix of independent variables for the pooled sample and Y is the vector formed by the logarithm of wages for males and females. Once the non-discriminatory wage structure is estimated, the weighting matrix is defined as Ω , and allows for the obtaining of the vector of coefficients contained in Equation (13):

$$\Omega_0 = (X'X)^{-1}(X'_HX_H) \quad (14)$$

where X is the matrix of observations for the pooled sample and X_H is the matrix of independent variables for males (or any majority group). Applying matrix calculation, Oaxaca and Ransom (Oaxaca and Ransom 1994) demonstrated the following equality:

$$\beta^0 = \Omega_0 \hat{\beta}_h + (I - \Omega_0) \hat{\beta}_m = \hat{\beta} \quad (15)$$

which is the expression to be used to explain the wage gap when nepotism and discrimination exist simultaneously.

Therefore, these coefficients should be estimated in order to estimate the discrimination coefficient. In this regard, an important aspect to keep in mind is that the sample is collected in companies and, therefore, the data should be interpreted from the perspective of labor demand. In fact, our approach considers that employers would require workers based on their characteristics, labor productivity being the main requirement; however, depending on the time of recruitment, other features are also valued. This approach will be implemented based on the application developed by Corugedo for the labor market (Diaz-Serrano 2013) of the Lancaster and Gorman models (Ñopo, Daza et al. 2012; Ghinetti and Lucifora 2013), methodology applied by Perez and Hidalgo for the EES 1995 nationwide (Nicodemo and Ramos 2012), and models used in Hidalgo and Perez to estimate the wage determinants of youth (Smith, Smith et al. 2011).

Under the general assumptions of Lancaster's model on demand characteristics, we would consider that the employers do not know, a priori, the labor productivity of individuals whom they hire. Namely, there is asymmetric information on the labor productivity of individuals, so that employers, when hiring, will fix salaries based on factors that reveal the true labor productivity of workers. The essential factor is the educational attainment of the individual, as the employer assigns higher labor productivity to higher educational titles. On the other hand, employers also

consider a number of personal characteristics, such as sex, age, or nationality, which can partly influence an employee's wage.

Once an employee is hired, the employer will confirm (i) the forecasts about his/her labor productivity, changing his/her wage to adjust for his/her actual labor productivity, and (ii) the process of accumulation of human capital that the individual performs within the company. This is done using the variable of seniority, which summarizes the career path in the firm. Therefore, we introduced a number of variables to summarize the characteristics of both the job and company.

As such, the fundamental variables of the model are education (E), seniority (A), other personal characteristics (Z), those related to the job (T), and those related to the company (F). Then, the demand for labor in accordance with the characteristics is:

$$W = f(E, A, Z, T, F) \quad (16)$$

$$\frac{\partial W}{\partial E} > 0; \quad \frac{\partial W}{\partial A} > 0 \quad \frac{\partial W^2}{\partial A^2} < 0$$

This model's assumption is that wages grow with education (E) as the employer uses education level as a signal to identify the labor productivity of workers. Similarly, wages increase with seniority (A) because it reflects the accumulation of human capital that individuals develop within the company. The negative sign of the second derivative of wages, with respect to seniority, indicates the concavity of age-wage profiles, since the growth of wages regarding the antiquity is at a peak. The features of the job are the type of contract (*contrato*), type of job within the company (*ocupa*), working time (*jornada*), and level of responsibility within the company (*responsa*). Among the variables that define the characteristics of the company, we would use the size of the enterprise (*tamele*), type of market (*mercado*), type of ownership (*propiedad*), main activity of the company (*sector*), and its geographic location (*CCAA*). Finally, note that the dependent variable is the Napierian logarithm of the monthly/hourly salary with the annual bonus payments prorated.

Finally, to study the main factors that explain the probability of suffering from discrimination in the labor market, a logistic regression model was carried out, where our outcome would be “1” if the person suffers from discrimination, and “0” otherwise.

The model’s specification is as follows:

$$y^* = \beta' X + \varepsilon$$

where y^* is not observed, X represents a vector of explanatory variables, β is a vector of the parameters, and ε is the standard error.

$$Y = \begin{cases} 1 & \text{if } Y^* > 0 \\ 0 & \text{if } Y^* \leq 0 \end{cases}$$

The discrimination rate variable was defined as follows; “1” if the difference between the real wage received and the wage that the worker should receive (according to education, age, expertise, etc...) is higher than 5 points, and “0” otherwise.

More precisely, the functional form is as follows:

$$\text{(Discrimination: “1” Yes, “0” No)}_i = \beta_0 + \beta_1 (\text{age}) + \beta_2 (\text{gender}) + \beta_3 (\text{educational level}) + \beta_4 (\text{years of experience}) + \beta_5 (\text{economic activity of caregiver}) + \beta_6 (\text{occupation}) + \beta_7 (\text{type of labor contract}) + \beta_8 (\text{size of enterprise}) + \beta_9 (\text{type of trade}) + \beta_{10} (\text{sector}) + u_i$$

RESULTS

The average hourly wage in Spain has increased from 7.80€ per hour in 1995 to 12.46€ per hour in 2010 (Table 1). The highest increase was for females, with 94.40% (53.38% for males).

The wage difference between males and females has been reduced during the analyzed period (1995-2010), dropping from 23.81% in 1995 to 12.79% in 2010 (Table 2). More precisely, the

difference in wages was 23.81% in 1995, 13.67% in 2002, 13.84% in 2006, and 12.79% in 2010.

With regard to the coefficient of the wage discrimination rate, it is observed that, as occurred with the wage difference, it has gone down during the period studied, ranging from 0.13 in 1995 to 0.05 in 2010 (Table 2). Of the total wage difference, 54.63% was due to the wage discrimination between males and females (45.37% due to difference in productivity) in 1995, 59.17% (40.83%) in 2002, 58.37% (41.63%) in 2006, and 45.97% (54.02%) in 2010.

Part of this wage discrimination might be due to a positive consideration of males in the labor market, and the other part might be due to a negative consideration of females (Table 2, Columns 3 and 4). During the analyzed period, the part of discrimination due to the positive consideration of males in the labor market has decreased sharply, from 42% in 1995 to 26.39% in 2010.

In addition, Table 3 shows the estimations from the logistic regression model, in which the probability of being discriminated against has been analyzed. According to these figures, males have 36% less probability of being discriminated against than females (Odd ratio, OR = 0.64). Likewise, people with high and medium levels of education have a higher probability of suffering from discrimination than those with low levels of education (OR = 15.66 and 5.81, respectively). Moreover, there is less likelihood that young people will be discriminated against than older people (OR = 0.28), and years of experience is positively associated with being discriminated against; that is, per one year of experience, the probability of suffering from discrimination is 15% higher (OR = 1.15). People with permanent and full-time contracts have a higher probability of being discriminated against than those with determinate and part-time contracts (OR = 3.64 and 2.10, respectively). Additionally, the sector was statistically significant to explaining the probability of suffering from discrimination. Those who work in

the public sector have 45% less probability of being discriminated against (OR = 0.55). The larger the enterprise, the higher the likelihood of being discriminated against. Alike, the scope of the trading of the company was also statistically significant to explaining the probability of being discriminated against. Concretely, those working for a company that markets in domestic trade have 71% more probability of being discriminated against than those who work for a company that markets in regional trade (OR = 1.71). This probability is double if the company markets in European trade (OR = 2.92) and tripled if it markets in world trade (OR = 3.96). Taking into account the sectors, in almost all of them (except in the supply, transport, and financial sectors) the probability of suffering from discrimination is lower than in the industry sector.

Broadly, we can observe that the characteristics related to the enterprise explain around 43% of the discrimination rate throughout the analyzed period, followed by the characteristics related to labor relationships and the employee (32% and 24%, respectively).

Regarding the gender wage gap, a number of factors, such as the presence of females in traditionally male sectors and more females in traditionally male occupations, have helped to reduce it, from 23.81% in 1995 to 12.79% in 2010. In addition, the coefficient of the wage discrimination rate has gone down during the studied period, from 0.13 in 1995 to 0.05 in 2010. However, we should be cautious when extrapolating the results as the survey used here just contains information of the Spanish enterprises with more than 10 workers, representing around 5% of the total companies in Spain.

Over recent decades, significant changes have taken place in the Spanish labor market, most notably the increased participation of females, jointly with the uneven distribution of tasks and occupations between males and females. The enormous advances in the education of females and their interests to participate in the labor market can generate a rapid disappearance of the

traditional inequalities between males and females; the truth is that this has been happening over the last years.

In Spain, several studies on the discrimination rate have been published since the 1990s. Most use the Salary Structure Survey, the European Union Household Panel, the Continuous Sample of Working Histories or the Survey on Living Conditions. The results of the most recent studies (Gardeazabal and Ugidos 2005; Hidalgo, Pérez et al. 2007; Simón, Ramos Lobo et al. 2008; Gradin and del Rio 2009; Pena-Boquete 2009; Pena-Boquete, De Stefanis et al. 2010; Moral-Arce, Sperlich et al. 2012; Guner, Kaya et al. 2014) vary significantly, depending on the data, year, methodology, and sectors considered in the analyses. Broadly, the gender gap varies between 13% and 45%, of which between 10% and 20% is associated with discrimination.

According to our figures, the wage gap has diminished from 23.81% in 1995 to 12.79% in 2010, with the main reduction taking place during the first years of the economic expansion (1995 to 2002, when the wage gap was just of 13.67%, very similar to that of 2010). Moreover, wage discrimination has also dropped from 0.13 in 1995 to 0.0588 in 2010, with the main reduction occurring between 1995 and 2002 (in the first years of economic growth, from 0.13 to 0.08) and 2006 to 2010 (last year of economic growth and beginning of the crisis, 0.08 to 0.05). Overall, the gender gap in 2010 was 53.7% of what it was in 1995, while wage discrimination between males and females in 2010 was just 45.2% of what it was in our first year considered (1995). Therefore, we can assume that the discrimination rate has dropped more than the gender gap; as a result, most of the gender gap can be explained by the differences in labor productivity between males and females over the analyzed period.

A recent study focused on the earning inequalities in Spain, analyzing their evolution from 1988 to 2010, using data from Social Security records (Bonhomme and Hospido 2013). They found that inequality decreased during the expansion periods (between 1995 and 2007), but

increased during recessions (after 2007). However, our figures showed the opposite. This difference in the results may be explained by the fact that Bonhomme and Hospido included earning inequalities as a whole, whereas we just included the gender gap. Generally, comparing our results with others may be quite difficult as, to our knowledge, there are no studies that have analyzed the evolution of the discrimination rate through such a wide time period as ours. However, several studies have estimated both the gender gap and gender discrimination in Spain from 1995 to 2002. Moral-Arce et al. (Moral-Arce, Sperlich et al. 2012) estimated a fall in the gender gap from 35% to 24% from 1995 to 2002, while gender wage discrimination remained almost constant (falling only from 25% to 24%). Likewise, Simón et al. (Simón, Ramos Lobo et al. 2008) showed a decrease in the gender wage gap from 1995 to 2002 (30.9% to 29.4%), with a portion non-associated with the objective factors, from 41.6% to 39.2% over those same years.

Moreover, there are several researchers that have analyzed the discrimination rate among immigrant workers (Anton, de Bustillo et al. 2012), and they concluded that the gender gap and female wage discrimination is higher for immigrant workers from poorer countries. Additionally, collective bargaining plays an interesting role in female wage discrimination (Felgueroso, Perez-Villadoniga et al. 2008); for females with low wages, collective bargaining might help to reduce discrimination. Further, when considering females with high wages and better jobs, bargaining provides for lower wage discrimination. Another interesting result for Spain is the fact that the gender gap is nearly non-existent in the public sector, taking place mainly in the private one (Aláez-Aller, Longás-García et al. 2011), a result that is similar to ours. Finally, Scicchitano (Scicchitano 2014) analyzed the wage gap among managers and concluded that, for those earning the highest wages, even though the characteristics of males and females working in equivalent jobs are the same, the wages are higher for males.

Some future lines of research that might continue and complement this work may be analyzing the discrimination rate among young people (younger than 30 years old) as well as among senior workers (older than 55 years old). Furthermore, analyzing the main determinants that make discrimination rate higher could be also useful for forthcoming studies.

CONCLUSION

Generally, although the discrimination rate has decreased over the analyzed period, there is still a discrimination rate of 0.0588 between males and females. Therefore, ways and measures to eliminate this discrimination should be undertaken as soon as possible. The future of employment of females in Spain seems to no longer depend on the ability to adapt to the changes imposed by the labor market, which females have been doing in the last decade. Therefore, to eliminate the wage gap, adopting policies to combat discrimination and take advantage of this adaptation will be needed. This need is justified because females are facing a series of cultural, social, and monetary barriers that hinder their access to the labor market. The employment opportunities for females are not the same as those for males. To combat this, there should be a direct intervention through laws, in order to combat the discrimination and inequalities that present in the labor market in Spain.

REFERENCES

- Aláez-Aller, R., J. C. Longás-García, et al. (2011). "Visualising gender wage differences in the European Union." Gender, Work and Organization **18**(Suppl 1): e49-e87.
- Anton, J. I., R. M. de Bustillo, et al. (2012). "Raining stones? Female immigrants in the Spanish labour market." Estudios De Economía **39**(1): 53-86.
- Bartolucci, C. (2013). "Gender Wage Gaps Reconsidered A Structural Approach Using Matched Employer- Employee Data." Journal of Human Resources **48**(4): 998-1034.
- Becker, G. (1957). The economics of discrimination. Chicago, University of Chicago Press.
- Blau, F. D. and L. M. Kahn (2000). "Gender Differences in Pay." Journal of Economic Perspectives **14**(4): 75-99.
- Blinder, A. S. (1973). "Wage Discrimination: Reduced Form and Structural Estimates." Journal of Human Resources **8**(4): 436-455.
- Bonhomme, S. and L. Hospido (2013). "Earnings inequality in Spain: new evidence using tax data." Applied Economics **45**(30): 4212-4225.

- Cotton, J. (1988). "Discrimination and Favoritism in the United-States-Labor-Market - the Cost to a Wage Earner of Being Female and Black and the Benefit of Being Male and White." American Journal of Economics and Sociology **47**(1): 15-28.
- Diaz-Serrano, L. (2013). "Immigrants, natives and job quality: evidence from Spain." International Journal of Manpower **34**(7): 753-775.
- Diaz, M. A. and R. Sanchez (2011). "Gender and potential wage in Europe: a stochastic frontier approach." International Journal of Manpower **32**(4): 410-425.
- Felgueroso, F., M. J. Perez-Villadoniga, et al. (2008). "The effect of the collective bargaining level on the gender wage gap: Evidence from Spain." The Manchester School **76**(3): 301-319.
- Fransen, E., J. Plantenga, et al. (2012). "Why do women still earn less than men? Decomposing the Dutch gender pay gap, 1996-2006." Applied Economics **44**(33): 4343-4354.
- Gardeazabal, J. and A. Ugidos (2005). "Gender wage discrimination at quantiles." Journal of Population Economics **18**(1): 165-179.
- Ghinetti, P. and C. Lucifora (2013). "Public-private wage gaps and skill levels: evidence from French, British and Italian micro data." International Journal of Manpower **34**(5): 429-446.
- Goldberg, M. S. (1982). "Discrimination, Nepotism, and Long-Run Wage Differentials." Quarterly Journal of Economics **97**(2): 307-319.
- Gradin, C. and C. del Rio (2009). "Aspectos distributivos de las diferencias salariales por razón de género en España: Un análisis por subgrupos poblacionales." Hacienda Publica Espanola(189): 9-46.
- Grove, W. A., A. Hussey, et al. (2011). "The Gender Pay Gap Beyond Human Capital." Journal of Human Resources **46**(4): 827-874.
- Guner, N., E. Kaya, et al. (2014). "Gender gaps in Spain: policies and outcomes over the last three decades." SERIEs: Journal of the Spanish Economic Association **5**(1): 61-103.
- Hedija, V. and P. Musil (2011). "Gender Pay Gap--Application in the Specific Enterprise." Review of Economic Perspectives **11**(4): 223-236.
- Hidalgo, A., S. Pérez, et al. (2007). La discriminación laboral de la mujer. Una década a examen. Madrid, Instituto de la Mujer. Ministerio de Igualdad.
- Mingorance-Arnáiz, A. C. and R. P. Olmedo (2015). "Mitos y realidades del mercado de trabajo español. (Spanish)." Myths and Realities of the Spanish Labour Market. (English) **33**(1): 223-257.
- Moral-Arce, I., S. Sperlich, et al. (2012). "Trends in the Gender Pay Gap in Spain: A Semiparametric Analysis." Journal of Labor Research **33**(2): 173-195.
- Neumark, D. (1988). "Employers Discriminatory Behavior and the Estimation of Wage Discrimination." Journal of Human Resources **23**(3): 279-295.
- Nicodemo, C. and R. Ramos (2012). "Wage differentials between native and immigrant women in Spain." International Journal of Manpower **33**(1): 118-136.
- Ñopo, H., N. Daza, et al. (2012). "Gender earning gaps around the world: a study of 64 countries." International Journal of Manpower **33**(5): 464-513.
- Oaxaca, R. (1973). "Male-Female Wage Differentials in Urban Labor Markets." International Economic Review **14**(3): 693-709.
- Oaxaca, R. L. and M. R. Ransom (1994). "On Discrimination and the Decomposition of Wage Differentials." Journal of Econometrics **61**(1): 5-21.
- Pena-Boquete, Y. (2009). "A comparative analysis of the evolution of gender wage discrimination: Spain vs. Galicia." Papers in Regional Science **88**(1): 161-180.
- Pena-Boquete, Y., S. De Stefanis, et al. (2010). "The Distribution of Gender Wage Discrimination in Italy and Spain: A Comparison Using the ECHP." International Journal of Manpower **31**(2): 109-137.
- Plasman, R. and S. Sissoko (2005). "The Gender Wage Gap in an International Perspective." Brussels Economic Review/Cahiers Economiques de Bruxelles **48**(4): 419-442.
- Scicchitano, S. (2014). "The gender wage gap among Spanish managers." International Journal of Manpower **35**(3): 327-344.

- Simón, H. J., R. Ramos Lobo, et al. (2008). "Evolucion de las diferencias salariales por razon de sexo. (Trends in the Gender Wage Gap in Spain. With English summary)." Revista de Economia Aplicada **16**(48): 37-68.
- Smith, N., V. Smith, et al. (2011). "The gender pay gap in top corporate jobs in Denmark." International Journal of Manpower **32**(2): 156-177.
- Suh, J. (2010). "Decomposition of the Change in the Gender Wage Gap." Research in Business and Economics Journal **1**: 1-18.
- Sulis, G. (2011). "Gender wage differentials in Italy: a structural estimation approach." Journal of Population Economics **25**(1): 53-87.
- Vandenberghe, V. (2011). "Firm-Level Evidence on Gender Wage Discrimination in the Belgian Private Economy." Labour **25**(3): 330-349.
- Weichselbaumer, D. and R. Winter-Ebmer (2005). "A Meta-Analysis of the International Gender Wage Gap." Journal of Economic Surveys **19**(3): 479-511.
- Weichselbaumer, D. and R. Winter-Ebmer (2007). "The Effects of Competition and Equal Treatment Laws on Gender Wage Differentials." Economic Policy(50): 235-273, 282-287.
- Weinberger, C. J. (2011). "In Search of the Glass Ceiling: Gender and Earnings Growth among U.S. College Graduates in the 1990s." Industrial and Labor Relations Review **64**(5): 949-980.
- Zafar, B. (2013). "College Major Choice and the Gender Gap." Journal of Human Resources **48**(3): 545-595.

Table 1. Average hourly wage by gender (1995-2010)

	Female	Men	Both
1995	6.26	8.26	7.80
2002	6.66	7.85	7.43
2006	7.80	9.22	8.67
2010	12.17	12.67	12.46
Difference %	94.40%	53.38%	54.74%

Source: Authors of this paper using data from Salary Structure Survey (1995-2010)

Table 2. Gender difference in wages between men and female (1995-2010)

1995		Ln (G_{hm} + 1) = 0.2381		Ln (D_{hm} + 1) = 0.1301	
Structure	Ln (D _{hm} + 1)	Ln (Q _{hm} + 1)	Ln (δ _{ho} + 1)	Ln (δ _{om} + 1)	
	(1)	(2)	(3)	(4)	
Difference	0.1301	0.1080	0.1000	0.0301	
Percentage	54.63	45.37	42.00	12.63	
2002		Ln (G_{hm} + 1) = 0.1367		Ln (D_{hm} + 1) = 0.0809	
Structure	Ln (D _{hm} + 1)	Ln (Q _{hm} + 1)	Ln (δ _{ho} + 1)	Ln (δ _{om} + 1)	
	(1)	(2)	(3)	(4)	
Difference	0.0809	0.0558	0.0523	0.0286	
Percentage	59.17	40.83	38.27	20.90	
2006		Ln (G_{hm} + 1) = 0.1384		Ln (D_{hm} + 1) = 0.0808	
Structure	Ln (D _{hm} + 1)	Ln (Q _{hm} + 1)	Ln (δ _{ho} + 1)	Ln (δ _{om} + 1)	
	(1)	(2)	(3)	(4)	
Difference	0.0808	0.0576	0.0493	0.0315	
Percentage	58.37	41.63	35.63	22.74	
2010		Ln (G_{hm} + 1) = 0.1279		Ln (D_{hm} + 1) = 0.0588	
Structure	Ln (D _{hm} + 1)	Ln (Q _{hm} + 1)	Ln (δ _{ho} + 1)	Ln (δ _{om} + 1)	
	(1)	(2)	(3)	(4)	
Difference	0.0588	0.0691	0.0337	0.0250	
Percentage	45.97	54.02	26.39	19.57	

Note: (1) Expresses the discrimination rate. (2) Expresses the differences in wages due to productivity. (3) Positively consideration to men. (4) Negative consideration to women. Source: Authors of this paper using data from Salary Structure Survey (1995-2010)

Table 3. Results from the logistic regression model

	Odds Ratio	Std. Err.	P>z
Male	0.6392	0.0098	0.000
High Education	15.6697	0.5689	0.000
Mid Education	5.8147	0.0816	0.000
Young	0.2803	0.0037	0.000
Years of experience	1.1539	0.0023	0.000
Professions associated with 2nd and 3rd university degree	0.3513	0.1323	0.006
Professions associated with 1st university degree	0.2742	0.1028	0.001
Technical and profesional support	0.3960	0.1432	0.010
Administrative employees	0.3158	0.1146	0.001
Workers in catering and personal services	0.1829	0.0654	0.000
Safety Service workers and security	0.0197	0.0070	0.000
Skilled building trade workers	0.0151	0.0053	0.000
Machinery Operators	1.0250	0.4232	0.952
Skilled extractive industry, metallurgy workers.	0.0311	0.0112	0.000
Skilled textile and art industry workers	0.0162	0.0058	0.000
Operators in machinery industry	0.1700	0.0614	0.000
Drivers and operators of machinery	0.0296	0.0105	0.000
Unskilled service workers	0.0460	0.0164	0.000
Military Workers	1.0163	0.3771	0.965
Elemental Workers	0.0034	0.0012	0.000
Permanent Contract	3.6478	0.0531	0.000
Full Time Contract	2.1040	0.0348	0.000
Public Sector	0.5554	0.0167	0.000
Small entreprise	3.0099	0.0461	0.000
Medium entreprise	7.9355	0.1560	0.000
Big entreprise	1.3698	0.0621	0.000
Domestic Trade	1.7132	0.0242	0.000
European Trade	2.9256	0.1077	0.000
World Trade	3.9691	0.1724	0.000
Extractive Industry	0.6880	0.0154	0.000
Supply Industry	17.4697	2.5750	0.000
Electricity Sector	0.4832	0.0114	0.000
Building Trade	0.5059	0.0146	0.000
Finalcial Services	1.2327	0.0488	0.000
Transport services	14.3535	3.1838	0.000
Telecommunication services	0.3087	0.0075	0.000
Catering Sector	0.1601	0.0129	0.000
Education	0.5890	0.0330	0.000
Health and Social services	0.1209	0.0039	0.000
Other activities and services	0.5009	0.0162	0.000
Intercept	25.4019	9.0714	0.000

Source: Authors using data from the Salary Structure Survey (1995-2010)