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*Decomposition of gender wage differentials among Portuguese top
management jobs*

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Abstract

This paper studies gender wage differentials among top managers in the Portuguese economy. The objective is to investigate whether men and women within the same occupational group, with relatively high levels of human capital, and who are evaluated basically on their performance, are treated unequally in relation to pay. The Oaxaca wage differential decomposition method is used, relying on 1999 micro data gathered by the Portuguese Ministry of Social Security and Employment. The main findings indicate that a substantial portion of the wage gap between male and female top managers in Portugal is explained by wage discrimination.

1. Introduction

Over the last decades the Portuguese labor market has been marked by some dramatic changes. Perhaps the most striking aspect of these transformations has been the sharp increase of women's participation in the labor force. This increase has been such that Portugal's female employment rate ranks among the highest within the European Union. Despite the significant progress of women in relation to their integration into the labor market, gender wage differentials persist in the Portuguese economy. In fact, when compared to other European countries, Portugal presents what is considered a substantially high gender wage gap (Santos and Gonzalez, 2003).

The factors that determine gender wage differentials have been the object of much discussion among economists. It is possible to divide the main theories provided over time to explain these differentials into three groups: human capital differences, labor market discrimination, and occupational gender segregation. Although the traditional approach in analyzing the determinants of the gender wage gap is to consider both the role of differences in workers' human capital characteristics and labor market discrimination, more recently scholars have considered occupational gender segregation as an important factor underlying the disparity between male and female wages.

The purpose of this paper is to study gender wage differentials among top managers in the Portuguese economy. Specifically, the objective is to investigate whether, in Portugal, men and women within the same occupational group, with relatively high levels of human capital, and who are evaluated basically on their performance, are treated unequally in relation to pay.

This paper uses the Oaxaca (1973) wage decomposition procedure to conduct the empirical analysis. This method decomposes wage differentials into two portions: a portion explained by observable differences in male and female human capital characteristics and an unexplained portion potentially due to wage discrimination. Although numerous empirical studies conducted in other countries (Barbezat, 1987; Bertrand and Hallock, 2001; Monk-Turner and Turner, 2001; Neuman and Weisberg, 1998) have based their investigation of the gender wage gap on the application of the Oaxaca technique, few studies have used this method to analyze gender wage differentials in the Portuguese economy (Kiker and Santos, 1991; Vieira and Pereira,

1992). Furthermore, no analysis is known to have applied this procedure to the decomposition of gender wage disparities among top managers in Portugal.

The study relies on micro data gathered annually by the Portuguese Ministry of Social Security and Employment (MSST). This database includes information on firms, establishments, and workers.

This paper is organized as follows. Section 2 briefly reviews the main theories that provide important explanations for gender wage differentials. Sections 3 and section 4 describe the empirical model and the data set used, while section 5 presents and discusses the results. Concluding remarks are presented in section 6.

2. Determinants of gender wage differentials

Why do women earn lower wages than men? The factors that determine gender wage differentials have been the object of much discussion among economists. The result of this ongoing debate is the development of various theories that provide some important explanations for these differentials. It is possible to divide the main reasons presented over time for the gender wage gap into three groups: human capital differences, labor market discrimination, and gender segregation, in particular across occupations.

The traditional approach in analyzing the determinants of the wage gap is to consider both the role of differences in human capital characteristics and labor market discrimination. The human capital theory (Mincer and Polachek, 1974) suggests that the gap is due to the fact that, when compared to men, women have fewer labor market qualifications, such as formal education, experience, and training. The results of these differences in human capital are lower levels of productivity for women and, therefore, lower wages. This theory's explanation for different acquisitions of human capital is based upon the traditional role of women within the family. Because they tend to have shorter and more interrupted working lives than men, women have less incentive to invest in labor market qualifications (Blau and Kahn, 2000).

In addition to differences in human capital characteristics, labor market discrimination is often pointed out as a main source of gender wage differentials. Blau and Ferber (1986: 229) consider that this form of discrimination exists when “two

equally qualified individuals are treated differently solely on the basis of their sex”. Thus, in accordance with the discrimination theory, gender disparities in earnings arise from the unequal treatment of equally productive male and female workers.

More recently, and apart from the two traditional explanations referred to above, scholars have considered occupational gender segregation as an important factor underlying the differentials in gender earnings. This type of segregation exists when women and men are employed in different types of occupations: those typically occupied by women and those typically occupied by men (Preston, 1999). The segregation theory suggests that gender differences in pay stem from the fact that female-dominated jobs are generally paid more poorly than male-dominated jobs (Boraas and Rodgers, 2003).

It is important to note that most economists do not necessarily consider these three factors as mutually exclusive reasons for the gender wage gap. Many authors refer to the possibility of more than one factor’s contribution to the determination of this gap. In her analysis of the Portuguese female labor force participation, Cardoso (1996) concludes that gender wage differentials do not result exclusively from lower levels of female human capital and from the concentration of female employment in less regarded occupations or economic sectors. This author considers that disparities between male and female wages are also due to the fact that, at each human capital level and in each occupational or economic sector, women with equal characteristics as that of men are paid less. Since occupational segregation is controlled for by choosing a very narrowly defined occupation (top managers), this paper analyzes the role of human capital differences and labor market discrimination as the determinants of gender wage differentials among Portuguese top managers.

Related to the theoretical discussion of reasons for the gender wage gap is the formulation of various mathematical and statistical methods aimed at decomposing wage differentials. One of the most often used methods for the decomposition of wage differentials between two comparison groups is the standard approach derived by Oaxaca (1973)¹. The next section summarizes this decomposition procedure that is used to conduct the analysis of wage disparities among top managers in the Portuguese economy.

¹ This method was also derived in Blinder (1973).

3. The model

The Oaxaca decomposition method divides average differences in wages into two components: one explained by observable differences in male and female human capital characteristics and the other, unexplained, that stems from the different rates of return to those characteristics (attributed to wage discrimination).

Following Oaxaca's method, two separate regressions are run for men and women:

$$\ln(W_m) = \beta_m X_m + \mu_m \quad (1)$$

$$\ln(W_f) = \beta_f X_f + \mu_f, \quad (2)$$

where subscripts m, f indicate the gender (respectively male and female); $\ln(W_m), \ln(W_f)$ are the logarithms of hourly wages; X_m, X_f are matrices of human capital characteristics; β_m, β_f are vectors of the coefficients to be estimated; and μ_m, μ_f are the error terms.

From the OLS estimation of equations (1) and (2) it results that:

$$\ln(\overline{W}_m) = \hat{\beta}_m \overline{X}_m \quad (3)$$

$$\ln(\overline{W}_f) = \hat{\beta}_f \overline{X}_f, \quad (4)$$

where $\hat{\beta}_m, \hat{\beta}_f$ are vectors of the estimated regression parameters and $\overline{X}_m, \overline{X}_f$ are matrices of the means of human capital characteristics. Given these results, the wage differential between men and women can be written as:

$$\ln(\overline{W}_m) - \ln(\overline{W}_f) = \hat{\beta}_m \overline{X}_m - \hat{\beta}_f \overline{X}_f. \quad (5)$$

By adding and subtracting $\hat{\beta}_m \overline{X}_f$ from the right-hand side of equation 5, it follows that:

$$\ln(\overline{W}_m) - \ln(\overline{W}_f) = \hat{\beta}_m (\overline{X}_m - \overline{X}_f) + \overline{X}_f (\hat{\beta}_m - \hat{\beta}_f). \quad (6)$$

This equation corresponds to the Oaxaca decomposition based on the returns to men. The first term on the right hand side represents the portion of the wage differential which is explained by differences in male and female human capital. This portion can also be interpreted as the wage gain women would obtain if they had the same average human capital characteristics as men. The second term indicates the portion of the wage differential that stems from different rates of return to those characteristics, usually interpreted as wage discrimination. It represents the wage gain that, given their average characteristics, women would obtain if they were paid the same as men.

The wage differential decomposition specified in equation (6) assumes that the non-discriminating wage structure corresponds to the male wage structure, that is, in the absence of discrimination, women will have the same rates of return as that of men. However, if it is assumed that the non-discriminating wage structure is the female wage structure², then the decomposition may be written as follows:

$$\ln(\overline{W}_m) - \ln(\overline{W}_f) = \hat{\beta}_f(\overline{X}_m - \overline{X}_f) + \overline{X}_m(\hat{\beta}_m - \hat{\beta}_f). \quad (7)$$

4. The data

The analysis is performed for the year of 1999³, based on micro data gathered by the Portuguese Ministry of Social Security and Employment (MSST). These data are based on an inquiry that every establishment with wage earners is legally obliged to fill out. The inquiry includes information on firms and establishments, such as their size, location, economic activity and employment, as well as information on workers, for instance, gender, age, occupation, schooling, skill, tenure with the current firm, monthly wages and hours worked.

The sample consists of 5,156 top managers⁴ that represent 3% of the total working force. For the year in analysis, only 25% of top management jobs were held by women,

² Although the assumption normally made is that the male wage structure prevails in the absence of wage discrimination, this paper uses both possibilities in the empirical analysis.

³ Given that 1999 is the last year for which information is available.

⁴ Due to their low representation, observations regarding the public administration and agricultural sectors were excluded. Observations coded zero for the variables birth date, admission date and schooling were dropped due to incoherent information.

indicating a disproportionate representation of women in Portuguese top corporate jobs. Table 1 summarizes the main characteristics of male and female top managers.

Table 1. Descriptive statistics of male and female top managers in Portugal, 1999

Characteristics (N = 5156)	Men			Women		
	%	Mean	Std. deviation	%	Mean	Std. deviation
Share of top managers in labor force	2.3			0.7		
Share of workers by gender	75.0			25.0		
Hourly wage (PTE)		2629	2207		1905	1745
Education (years)		12.163	4.153		12.210	4.152
<i>4 years</i>	10.0			10.4		
<i>6 years</i>	7.2			6.9		
<i>9 years</i>	14.2			12.2		
<i>12 years</i>	21.0			23.0		
<i>15+ years</i>	47.6			47.5		
Age (years)		43.409	10.687		39.225	10.232
Experience (years)		25.246	12.271		21.015	12.515
Tenure (years)		9.256	9.275		7.712	8.093
Skill levels						
<i>Top managers and professionals</i>	74.9			72.3		
<i>Other managers and professionals</i>	8.9			9.8		
<i>Foremen and supervisors</i>	0.5			0.5		
<i>Highly skilled personnel</i>	1.3			2.3		
<i>Skilled personnel</i>	0.3			0.8		
<i>Semi-skilled personnel</i>	0.1			0.0		
<i>Unskilled personnel</i>	0.1			0.2		
<i>Unknown</i>	13.9			14.1		

Source: Computations based on Portugal, MSST (1999).

Notes: Average hourly regular wages are computed as $(bw+ts+rs)/nh$: bw stands for the base wage, ts is the payment indexed to tenure, rs are regular subsidies and nh is the number of normal hours worked. Experience is computed as $(age-school-6)$. The equivalent of 200.482 PTE is 1 Euro.

In relation to pay, the average gross hourly wages of men are higher than that of women: women earn 0.72 of the average hourly wages earned by men. Differences in the educational attainments of male and female top managers are small. In fact, these two groups have very similar distributions among the different levels of their formal education. While the majority (48%) has 15 or more years of schooling, 35% have 9 to 12 years, 7% have 6 years, and 10% have 4 years.

In the sample, male top managers are older and have more work experience than female top managers by about four years. Tenure with the current firm is also greater for men than for women. On average, male top managers have worked with the same

firm for 9 years, while female top managers have dedicated 8 years to the same employer. In relation to skill levels, the majority of both male and female top managers are considered to have top working skills.

5. Results of the empirical analysis of gender wage differentials in Portuguese top management

Following Oaxaca's decomposition procedure, two separate wage regressions are run for male and female managers. Table 2 presents the results of these regressions. The following explanatory variables were included: years of schooling, years of experience, years of experience squared, years of tenure, and years of tenure squared.

Table 2. Results of wage regressions of male and female top managers in Portugal, 1999

Independent variables	Men	Women
Intercept	5.401*** (83.96)	5.041*** (46.05)
Education	0.120*** (38.81)	0.128*** (22.01)
Experience	0.033*** (9.05)	0.026*** (4.70)
Experience ²	-0.0004*** (-5.78)	-0.0003*** (-2.79)
Tenure	0.019*** (5.35)	0.040*** (6.50)
Tenure ²	-0.0001 (-0.69)	-0.0005** (-2.39)
Adjusted R ²	0.339	0.407
S _e	0.668	0.618
N	3866	1290

Source: Computations based on Portugal, MSST (1999).

Notes: Values in parentheses are t-statistics; *statistically significant at the 0.10 level; **at the 0.05 level; ***at the 0.01 level.

All of the regression coefficients are statistically significant at the 0.01 level except for tenure squared (for men and women). The results of the regression indicate an average rate of return to an additional year of schooling of 12% for men and 12.8% for women. The relationship between hourly wages and experience, as well as the relationship between hourly wages and tenure, take on a concave shape, i.e., experience and tenure have diminishing marginal effects on hourly wages.

From the analysis of the coefficients of the wage regressions, it is possible to conclude that there are differences in the returns to male and female top managers' human capital characteristics. While the returns to years of experience are larger for men than for women, the returns to year of schooling and years of tenure are larger for women.

The results of the application of Oaxaca's wage differential decomposition method are summarized in table 3. As stated above, the decomposition of the total wage gap is first performed assuming that the male wage structure is the prevailing wage structure (as in equation 6) and then assuming the female wage structure as the benchmark (as in equation 7).

Table 3. Results of the Oaxaca wage differential decomposition method

Decomposition	Total gap	Gap due to human capital differences	Gap due to discrimination
Decomposition based on male wage structure	0.33	0.09	0.24
Decomposition based on female wage structure	0.33	0.10	0.23

Source: Computations based on Portugal, MSST (1999).

The results of the decomposition, based on the male wage structure, reveal that 27% of the total wage gap is due to observable differences in the two groups' human capital characteristics, while 73% is attributable to wage discrimination. Similar to these results are those related to the decomposition based on the female wage structure. In this case, 30% of the gap results from differences in male and female characteristics and the remainder, 70%, is due to discrimination. It is possible to conclude that in both wage decompositions, a substantial portion of the wage differentials between male and female top managers in the Portuguese economy is explained by wage discrimination, whereas a small portion is attributable to the fact that these two groups have different levels of human capital.

6. Conclusion

This paper studied gender wage differentials among top managers in the Portuguese economy. The Oaxaca wage decomposition procedure was applied to 1999 micro data on firms and workers.

The main findings of this investigation indicate that wage discrimination underlies a substantial portion of the wage gap between male and female top managers in Portugal, whereas differences in human capital characteristics account for a small part of those differentials.

Future studies might involve an application of alternative decomposition procedures to the analysis of wage disparities among top managers in the Portuguese economy. On the other hand, and given the disproportionate representation of women in Portuguese top corporate jobs, one might also investigate the possibility of gender differences in job mobility, i.e., the possibility of men and women having different mechanisms of access to higher level jobs.

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