Gender roles in family and earnings differences in Brazil[1]

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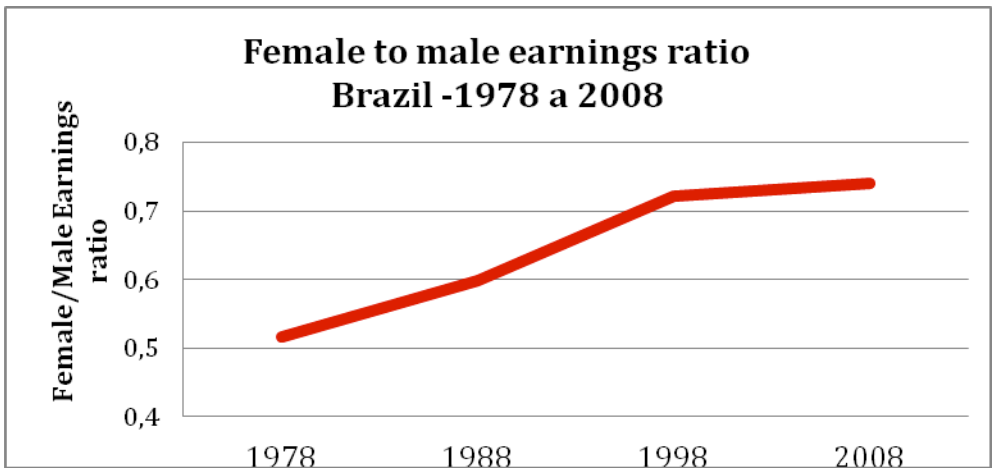
Introduction

The gender gap in the Brazilian labor market has been decreasing over the last decades with larger female labor force participation rates, improvements in educational levels for women, and declining fertility rates. By the end of the first decade of this millennium, female labor force participation in Brazil was approximately 47%, and women had improved their participation in almost every occupation. Differences in payments by gender have been declining steadily for 40 years, but the pace of reduction was lessened over the last decade (Wajnman, 2012). As seen in Figure 1, the female to male earnings ratio was slightly above 0.50 in 1978, reaching 0.72 in 1998. In the following decade, however, it was increased by only 0.02.

Figure 1



Several studies have tried to decompose the remaining gender gap in earnings, pointing that (i) differences in productive characteristics of men and women cannot explain men's advantage in earnings, since women have now attained higher education levels than men, and despite having less years of labor market experience, the returns to experience are

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higher for them; (ii) differences in occupational characteristics cannot explain male advantage either, as women are still segregated in specific jobs, but the average wage paid for female-typical jobs are not lower than those paid for the male-typical ones;[2] and (iii) the largest part of the earnings difference remains unexplained and it is usually attributed to discrimination against women (Barros et. al., 1995; Kassouf, 1998; Leme & Wajnman, 2000; Giuberti & Menezes-Filho, 2005).

Since earlier studies for other countries suggest that while the gender gap is narrowing down in the labor market, it remains in family life, my hypothesis is that the overcommitment of women with both paid work and housework is the fundamental constraint for equity in earnings in Brazil. Here I am naming housework in a broader sense, which includes not only the load of domestic obligations like cleaning, cooking, washing, and taking care of children, but all the effort spent on being the main responsible for the family group.

Therefore, the objective of this paper is to examine the extent to which family characteristics of Brazilian women and men help to explain the documented gender gap in earnings. To do that, I use Oaxaca–Blinder decomposition of the difference in earnings of men and women to assess the effect of the family characteristic controlling for all the usual individual and occupational variables.

Methods

I apply an Oaxaca-Blinder decomposition (Blinder, 1973, Oaxaca, 1973) of earnings equation for men and women, which divides the wage differentials between the two groups into a part that is "explained" by differences in productive characteristics such as education, experience and occupation, and a residual part that cannot be explained by these characteristics. The "unexplained" part is often used as a measure for discrimination, but it also encompasses the effects of group differences in unobserved predictors (Jann, 2008).

The general method, as exposed by Jann (2008), can be applied to any two groups such as male and female workers. Given these two groups, there is an outcome variable (Y), here, represented by the log of the monthly wages, and a set of predictors. The question is how much the mean outcome difference $R= E(Y_M) – E(Y_W)$ is accounted for by differences in the predictors. Based on the linear model

[2] While women are overrepresented in domestic work, which pays lower salaries, they are also overrepresented in well-paid occupations in the public sector and social activities.

$$Y_l = X_l'\beta_l + \varepsilon_l, \qquad E(\varepsilon_l) = 0, \qquad l \in \{M, W\}$$

where X is a vector containing the predictors and a constant, β contains the slope parameters and the intercept, and ε is the error. The mean outcome difference can be expressed as the difference in the linear prediction at the group-specific means of the regressors:

$$R = E(Y_M) - E(Y_W) = E(X_M)'\beta_M - E(X_W)'\beta_W$$

To identify the contribution of group differences in predictors to the overall outcome difference, the regression can be rearranged as follows:

$$R = [E(X_M) - E(X_W)]'\beta_W + E(X_W)'(\beta_M - \beta_W) + [E(X_M) - E(X_W)]'(\beta_M - \beta_W)$$

As Jann (2008) points out, this is a "three-fold" decomposition, in which the outcome difference is divided into three parts:

$$R = E + C + I$$

The first component E, is

$$E = [E(X_M) - EX_W)]'\beta_W$$

which corresponds to the part of the differential that is due to differences in the male and female predictors. This is called the "endowments effect". The second component is

$$C = E(X_W)'(\beta_M - \beta_W)$$

which measures the contribution of differences in the coefficients, including the differences in the intercept. And the third component is:

$$I = [E(X_M) - E(X_W)]'(\beta_M - \beta_W)$$

which is the interaction term accounting for the fact that differences in endowments and coefficients exist simultaneously between the groups of men and women.

Adding variables with higher explanatory power to the model, may reduce the unexplained component. As Jann (2008) points out, there is an alternative form of decomposition, which results from the concept that there is a nondiscriminatory coefficients vector that should be used to determine the contribution of the differences to the predictors. If β* is such a nondiscriminatory coefficient vector, the outcome difference can then be written as:

$$R = [E(X_M) - E(X_W)]'\beta^* + [E(X_M)'(\beta_M - \beta^*) + E(X_W)'(\beta^* - \beta_W)]$$

Then, we have a "two-fold" decomposition

$$R = Q + U$$

Where the first component is:

$$Q = [E(X_M) - E(X_W)]'\beta^*$$

which is the part of the differential in earnings that is explained by the differences in male and female predictors (the "quantity effect") and the second component is:

$$U = E(X_M)'(\beta_M - \beta^*) + E(X_W)'(\beta^* - \beta_W)$$

which is the "unexplained" part. This part is usually attributed to discrimination, but it is important to recognize that it also captures all the effects of differences in unobserved variables.

To apply the latter "two-fold" decomposition, I use the Stata implementation in a command called "oaxaca", described in great detail in Jann (2008). The command first estimates the models to each group (men and women, in this case). Next, the results of the decomposition and their standard errors are computed based on the combined parameter vector and the variance-covariance matrix of the models coefficients.

The data come from the National Household Sample Survey (Pesquisa Nacional por Amostra de Domicílios - PNAD) of 2009. I restrict the analysis sample to residents in Brazil, who are workers with positive monthly earnings and who are also heads, spouses/partners, children or other relatives in the families. The final sample has 169,152 observations (before using sample weights).

In order to explain the differences in earnings between men and women, I include the most used variables in the literature. I use two different indicators of human capital: years of schooling, and experience, measure according to age and age squared. Since women tend to experience time out of the labor market to have and raise children, I also include the variable "tenure on the current job" to have some control for labor experience. Finally, I add a dummy for white color of skin, as there are many evidences of racial differences in the Brazilian labor market.

As for the occupational characteristics, I include the number of hours worked a week, five groups of occupations (managers and professionals; technicians and clerical workers; service sale and trade workers; agricultural workers; and production of goods and service workers),

and five categories for status in employment (registered worker; unregistered worker; self-employed and employer; domestic worker; public server and military). In addition I add a control for the five geographical regions of the country (North, Northeast, Southeast, South and Central-West) and a dummy for urban areas.

Model 1 includes all the variables for personal and occupational characteristics. Model 2 adds to Model 1, two sets of family characteristics, which account for differences in the gender roles. In the first set, I test for the effect of having a spouse and of having at least one child under 14 years old on male and female earnings differences. The motivation for adding these variables is the evidence that children and marriage are sources of wage penalty for women, but wage premium for men , who would get higher wages for being both a parent and/or married (Heather, 1999; Waldfogel, 1998; Glauber, 2007; England et al. 2012). The second set of family characteristics include the average proportion of the weekly time spent as housework hours, measured as the ratio of weekly housework hours to weekly paid work hours subtracted of the total hours in a week.[3] It is undisputed that women do more household work than men, and therefore, it is expected that including housework time in the earnings equation may increase substantially the explained component of the gender wage gap (Straton & Herch, 1997, 2002).

Results

Table 1 shows the mean values and the coefficients of the variables included in the linear models. The dependent variable is the log of monthly earnings, which has a mean value of 6.63 and 6.32, for men and women, respectively, for the year 2009. It corresponds to a mean value of 1,234 Brazilian Reais for men and 897 for women, or a female to male ratio of 0.73. [4]

All the individual characteristics are significant at 1% level and show the expected signals. Men is slight older than women, and the earnings returns to age are larger among men. Age squared captures the concavity of the relationship between age and earnings and, as expected, reveals a decreasing incremental value of experience to individual remuneration

[3] That is: (housework hours/168 hours – weekly hours spent in paid work)

[4] Usually the equations for earnings or wages are expressed in terms of logs, as the coefficients in the log-linear equation can be interpreted as approximations of percentage effects. That is, coefficients can be read as an approximation of the effect on wages of an additional unit of the explained variable in percentage terms.

for both men and women. The job tenure at current employment is higher for men, but the effects on earnings are larger for women, indicating that one additional year at the same employment adds more to the remuneration of women than of men. As documented in the literature, women exhibit higher educational attainment - measured by years of schooling - than men, but obtain lower returns to education. Additionally, the prevalence of white workers is higher among women, probably because race/color discrimination in the labor market tends to be more severe for women than for men (Guimarães, 2002).

Regarding the occupational characteristics, the models confirm that mean weekly work hours are almost seven hours larger among men than women, but female hours of work receive higher returns. The prevalence of unregistered workers and domestic workers are larger among women; categories which receive the lowest earnings returns, On the other hand, there is a larger prevalence of other occupational groups among female workers, such as *managers and professionals*, t*echnicians and clerical workers* and *service sales and trade workers*, in which the level of returns are not at the bottom of the remuneration scale. These results are consistent with previous studies that have shown that segregation by gender in the Brazilian labor market does not always negatively affect women's wages (Giuberti & Menezes-Filho, 2005; Madalozzo, 2010). Both the controls for geographic regions and urban condition show unsurprising results. The prevalence of women workers is larger in the more developed regions (Southeast, South and Central-West) and in the urban areas of the country, where wage returns are higher.

The Model 2 reveals that the estimates for *have spouse* are positive and significant for both men and women, but stronger for male workers. Moreover, it is important to note that having a spouse is more frequent among male workers than among female workers. The proportion of workers having at least one child aged 14 years old or younger is almost the same for both sexes, but the coefficient is negative for men and positive for women. Therefore, the results suggest no maternity or marriage penalty for Brazilian women, when we control for all the other variables (indeed, there is a positive effect on female earnings).. However, the load of housework has a strong negative effect for the earnings of both men and women. The number of housework hours as a proportion of discounted time dedicated to paid work is almost four times larger for women than men, and the negative effect is also larger for female earnings.[5] The estimates suggest a substantial penalty for housework hours

[5] Considering the total of housework hours reported in PNAD 2009, men spent only 4.74, while women reported 18.43 hours of housework per week.

for both men and women, although it is considerably more severe among women, not only because they do more housework than men, but also because the negative effect over female earnings is higher.

Tables 2 and 3 present the results of the Oaxaca-Blinder decomposition of the actual difference in male and female earnings before (Table 2) and after (Table 3) controlling for family characteristics. According to the results in Table 2, the "explained component" of the difference between female and male earnings is negative, and therefore, the "unexplained component" exceeds 100%. The reason is both the higher education levels and the most favorable occupational characteristics among women. If earnings were due only to education, female wages would be, on average, 29% higher than male wages. At the same time, the occupational variables alone would generate earnings 16% higher for women than for men. The earnings advantage for men is therefore a result of differences in the coefficients associated with variables of Model 1 (not the prevalences), as well the effect of unobserved variables.

Not surprising, the addition of family variables to Model 1 (Table 3), increases the "explained component" substantially. It becomes positive, explaining 16% of the difference between earnings of men and women. In addition, the proportion of housework hours represents the second largest single effect on the explained component (31%), only after the load of work hours. Both of them indicate that gender differences in time use are closely related to the labor market outcomes and should be better understood in order to explain the differences in earnings.

Discussion

The gender gap in the Brazilian labor market has visibly narrowed down over the last decades, as women kept increasing their education and labor force participation, and have succeeded in formerly male-dominated occupations and careers. Nevertheless, women still earn a fraction of approximately 70% of what men do. The reasons for the remaining gap are not yet clarified.

Several studies have tried to enrich the analysis of the pay differences between men and women, adding a perspective of gender differences in family roles to this discussion. In this paper, I approach this by introducing "family life" variables to the traditional decomposition of male-female earnings differential. As a result, I find no

maternity or marriage penalty explaining the differences. On the other hand, the housework hours, taken on mostly by women, is found to have a large effect on the "explained component" of the difference.

Unfortunately, Brazilian statistics do not yet provide detailed time use information. PNAD Survey has only one question about the mean number of weekly hours spent on housework, with no detail on the variety of activities the general term "housework" encompasses. However, researches on gender inequalities in the labor market should address the effects of non-professional activities on professional choices and their monetary returns. Using American Time Use Survey of United States Department of Labor, Korenman et al. (2005) have shown that additional hours spent by women on typical female activities, like cooking, cleaning and laundry, are associated with lower pay, as found in other studies, while the effect of time spent on gender-neutral activities is less clear and could even be positive. Brazilian household survey (PNAD) is currently being reformulated and will include, for the years ahead, greater details on household chores and other non-paid activities, making it possible to go further on this research in the near future.

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Table 1

Earnings equations for men and women – Brasil, 2009

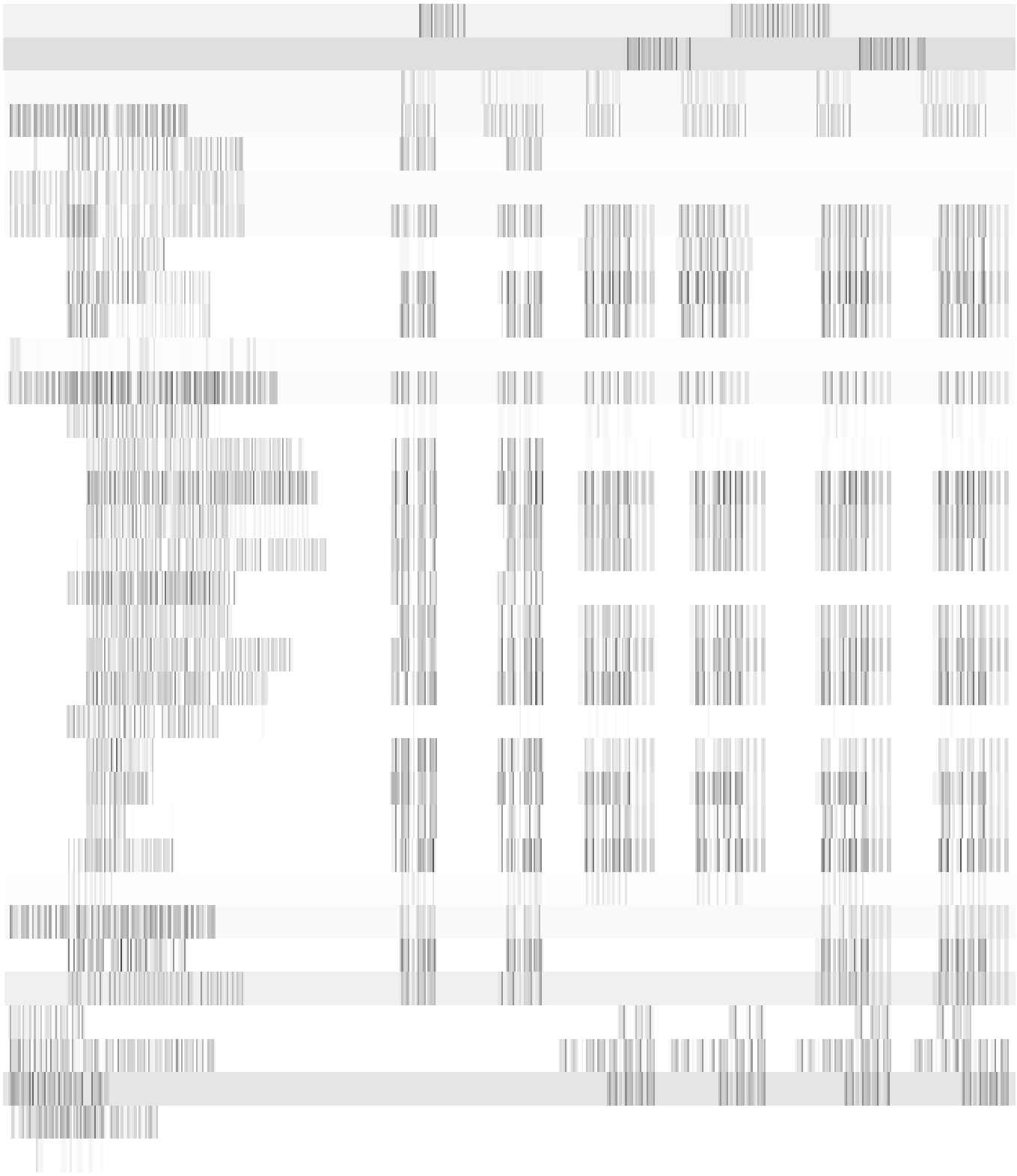

Table 2

Explaining diferences between earnings of men and women: Oaxaca- Blinder decomposition – Model 1 - Brazil, 2009

Synthesis				
ln do rendimento masculino	6,648			
ln do rendimento feminino	6,333			
difference	0,315			
	explained component		**unexplained component**	
	-0,052	-17%	0,366	117%
Individual Characteristics				
Years of schooling	-0,090	-29%	0,045	14%
age and current work experience	0,012	4%	0,225	71%
race	-0,005	-2%	0,007	2%
Occupational Characteristics				
Work hours	0,102	32%	-0,251	-80%
Ocupational variables	-0,050	-16%	-0,012	-4%
Regions and urban area	-0,020	-7%	-0,085	-27%
Constant			0,438	139%

Table 3

Explaining diferences between earnings of men and women: Oaxaca- Blinder decomposition – Model 2 - Brazil, 2009

Synthesis				
ln do rendimento masculino	6,648			
ln do rendimento feminino	6,333			
difference	0,315			
	explained component		**unexplained component**	
	0,050	16%	0,265	84%
Individual Characteristics				
Years of schooling	-0,091	-29%	0,069	22%
age and current work experience	0,012	4%	0,010	3%
race	-0,005	-2%	0,009	3%
Occupational Characteristics				
Work hours	0,100	32%	-0,264	-84%
Ocupational variables	-0,055	-17%	-0,013	-4%
Regions and urban area	-0,021	-7%	-0,085	-27%
Family Characteristics				
having spouse	0,012	4%	0,051	16%
havind children	0,000	0%	-0,016	-5%
% of housework hours	0,097	31%	0,020	6%
Constant			0,485	154%