Self-Employment and Discrimination An Analysis for Brazil

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ABSTRACT

Purpose: The aim of this study is to evaluate the wage gap between men and women who seek self-employment in Brazil, whether because they want to become entrepreneurs, out of necessity, or because of the flexible hours.

Design/methodology/approach: The data used are from the 2015 National Household Sample Survey (PNAD) and the methods are the Ordinary Least Squares for the Mean and the Unconditional Quantile Regression (RIF) for the distribution of gains of both genders, both associated with the Oaxaca-Ransom decomposition in order to separate the differential between the part explained by attributes and the unexplained part.

Findings: The main results show that women earn less than men in the mean and throughout the distribution. The average difference is 27.79%, varying between 19.24% and 48.26% in the distribution. The inclusion of occupational variables shows that the glass door phenomenon exists even in self-employment, that is, women choose occupations with lower incomes.

Originality/value: Stimulating self-employment has been an alternative policy for the insertion of women and minority groups in the labor market. This is the first study on the wage gap in self-employment in the Brazilian labor market. The country has recently been through a labor market deregulation, and these measures can have positive or negative effects on the high wage differentials between men and women.

Keywords: Discrimination. Gender. Self-employment. Brazil. Microeconometrics

JEL: J31; J16; J82.

RESUMO

Objetivo: O objetivo deste trabalho é avaliar o diferencial salarial entre homens e mulheres que buscam o auto emprego no Brasil, seja por empreendedorismo, por necessidade em época de crise ou por flexibilidade de horários.

Metodologia/dados: Os dados utilizados são da Pesquisa Nacional por Amostras de Domicílios (PNAD) para o ano de 2015 e os métodos são os Mínimos Quadrados Ordinários para a média e a Regressão Quantílica Não Condicional (RIF) para a distribuição dos ganhos de ambos os gêneros, ambos associados à decomposição de Oaxaca-Ransom afim de separar o diferencial entre a parte explicada por atributos e a parte não explicada.

Resultados: Os principais resultados mostram que as mulheres recebem menos que os homens na média e ao longo da distribuição. A diferença média é de 27,79%, variando entre 19,24% e 48,26% na distribuição. A inserção de variáveis ocupacionais evidencia

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que há o fenômeno de porta de vidro mesmo no auto emprego, ou seja, as mulheres ingressam em ocupações com menores rendimentos.

Originalidade: O estímulo ao auto emprego está sendo usado como política alternativa para a inserção das mulheres e de grupos minoritários no mercado de trabalho. Este é o primeiro estudo sobre o diferencial de salários no auto emprego no mercado de trabalho brasileiro. O país recentemente desregulamentou o mercado de trabalho e essas medidas podem surtir efeitos positivos ou negativos sobre os elevados diferenciais salariais entre homens e mulheres.

Palavras-chave: Discriminação. Gênero. Auto emprego. Brasil. Microeconometria.

Área 8 - Econometria

INTRODUCTION

Women receive, on average, lower incomes than men, although they have the same paying occupations, and have productive attributes similar to their male counterparts, such as education level, general and specific experience, as well as skills and training – according to UN's Progress of the World's Women. However, women receive, on average, 24.3% less than men working in the same functions (UN, 2015). A part of these wage differentials is due to the number of hours worked and occupation choice (Altonji and Blank, 1999). However, a significant part of this difference remains unaccounted for, as demonstrated by (Blinder, 1973; Oaxaca, 1973). This shows that there is employment discrimination against the female sex (Lechmann and Schnabel, 2012).

The neoclassical discrimination theory assumes the existence of three discrimination sources: employer, co-workers, and consumer (Becker, 1957). Within a perfect competition market, individuals act on their preferences in order to maximize their utility. The employer who has discriminatory preferences will reduce the income of women in order to compensate for the disutility of employing this gender. Statistical discrimination explains that the employer uses tests to reduce information asymmetries in hiring the worker. Since measures from these surveys are imperfect as measures of worker productivity, the employer uses gender as an observable characteristic to determine the level of productivity. Based on that observation, the employer will reach the conclusion that both genders are not equally productive (Arrow, 1973; Phelps, 1972).

Thus, an alternative for the female gender to avoid employer discrimination is to choose self-employment, which could reduce income inequalities between genders (Moore, 1983). Public policies aimed at self-employment are a way of tackling unemployment for groups that face barriers when entering the workforce, such as young people, immigrants, and women (Minola et al., 2014; Williams, 2012).

The choice of self-employment has taken on a more significant role within the labor market. Borges (2009) points out that developing countries have a more expressive number of self-employed people compared to developed countries, since it has become an alternative mainly for unemployment.

Storey (1994), Henrekson(2004) and Parker (2004) point out that the individuals would be drawn to self-employment (the 'pull effect') when faced with a positive outlook. According to Gomes (2009), this fact happens when the individual sees an opportunity in the market due to his/her knowledge of the area and the market conditions are favorable. The individual becomes self-employed voluntarily, having flexible hours, autonomy and obtains a higher income vis à vis if he/she had a wage employment. However, individuals can be pushed ('push effect') towards self-employment due to the lack of better opportunities. As it happens involuntarily, the opportunities of work and income are created before the shortage of jobs.

Hughes (2003) points out that until the 1990s, the pull effect was more noticeable than the push effect in the United States and Canada. Gomes (2009) shows that the situation in Brazil is different. The author points out that in the country the push effect happens due to a scenario of recession, therefore, people are "pushed" towards self-employment as an alternative to unemployment.

The Brazilian unemployment rate has risen during the crisis period, which started at the end of 2014. In the fourth quarter of 2015, the rate reached 8.96%, when it was 6.86% in the fourth quarter of the previous year, according to the Institute for Applied Economic Research (IPEA, 2016). In addition, there is difference in this percentage according to age group and gender. Young people aged between 14 and 24 years old had a much higher unemployment rate (20.9%) compared to the elderly (above 60 years old) with 2.5%. The same is true for women who have an unemployment rate (10.6%) higher than men (7.9%).

These estimates point to the incentives that these groups (women and young people) have to choose self-employment.

According to data from the National Household Sample Survey (PNAD), the percentage of self-employed men and women increased between 2011 and 2015. Men rose from 25.54% in 2011 to 27.38%, while women rose from 16.02% to 17.81% in the same period. The increase in self-employment is largely due to the crisis that the country has experienced since the second half of 2014. The choice for self-employment is a way of entering or returning to the Brazilian labor market, especially in times of crisis (Fusioka and Platt, 2018).

In the Spanish labor market there are some aspects that encourage self-employment, such as the fact that only 55.5% of women were employed in 2011, while countries like Portugal and France have a female employment rate of 64.8% and 64.7%, respectively, or as Sweden, where 77.2% of women were employed. Although in the Spanish labor market the self-employed work more, they receive less wages and yet there are unexplained wage differences, even when adding several covariates – marital status, number of children, education level, age, among others – (Álvarez et al., 2013).

Among the explanations for the unexplained differential in favor of men in self-employment is the fact that credit is more scarce and difficult for women to access (Asiedu et al., 2012; Coleman, 2000; Orser et al., 2006). Despite this factor, there is no evidence that banks discriminate against women when granting credit, the explanation is that women demand less credit for enterprises (Coleman, 2000). Women work fewer hours when compared to men, but there are no statistically significant differentials on wages in relation to career aspirations and flexibility of hours worked (Lechmann and Schnabel, 2012).

According to Becker's model of discrimination, the other sources of discrimination would come from consumers and co-workers (Becker, 1957), however, some studies find no evidence of discrimination on the part of the consumer (Aronson, 1991; Moore, 1983), therefore, they would be insufficient for the explanation of the gender wage differential in the self-employment market.

This article aims to investigate the presence of discrimination among self-employed workers according to gender in both the mean and the quantiles in the Brazilian labor market. The methodologies to be used will be Ordinary Least Squares (OLS) for the mean and Unconditional Quantile Regressions (RIF) for the wage distribution, both associated with the Oaxaca-Ransom decomposition, in order to decompose the differential between the explained and unexplained portion. The database will be PNAD, which is a complex and nationally representative sample for the year 2015.

Several studies have attempted to quantify wage discrimination in Brazil, but none of them focuses on the self-employment market. The contribution of this article is that it is the first to estimate the wage differential of self-employed men and women in the Brazilian labor market and with an increase in this type of work. In addition, the presence of wage differentials among self-employed men and women throughout the distribution may point to the need for specific policies that not only target the mean. These policies would, if the evidence points out, problems related to sticky floor (when salary differentials are higher in the lower tail compared to the median) and to the glass ceiling – when the wage differential is higher in the upper tail compared to the median – (Carrillo et al., 2014; Chi and Li, 2008). Another potential problem concerns the so-called glass door - women access the labor market via professions that pay less (Hassink and Russo, 2010), otherwise, the problem points to occupational segregation against women (Lechmann and Schnabel, 2012).The article is organized in 4 sections besides this introduction. The following section will present the empirical strategy with the Oaxaca-Ransom methods for the mean and Oaxaca-Ransom with RIF for the quantiles. Subsequently, we will show the data source:

the 2015 PNAD (National Household Sample Survey) with the respective descriptive statistics. In the fourth section the results will be shown and discussed. Finally, we will make the final considerations.

2. METHODOLOGY

The empirical strategy consists of estimating the gender discrimination, in the mean (Oaxaca-Ramson) and in the quantiles (RIF), for the Brazilian self-employed workers. There are omitted variables that would motivate the choice for this type of occupation, such as discrimination from the employer and the consumers (Becker, 1957), would be controlled because they would not correlate with gender discrimination in a self-employment situation (Williams, 2012). However, the choice for self-employment is not random, so there would be the presence of bias in unobservable variables (Lechmann and Schnabel, 2012).

2.1. Empirical strategy

2.1.1 Oaxaca-Blinder and Ransom

Discrimination against women exists when the relative wage of men is higher than the wage that would be considered if both genders were paid considering only their productive characteristics. Hence, this wage difference is represented by equation (1) (Mincer, 1974):

$$lnY_i \ = \ \beta_0 + \ \beta_1 \, educ_i \ + \ \beta_2 exp_i + \ \beta_3 exp_i^2 + \ \gamma' X_i \ + \varepsilon_i \qquad (1)$$

The log of wage i is illustrated in equation 11 by lnY_i. The variable $educ_i$ stands for years of education, exp_i represents the years of experience that affect the individual's wage i, exp_i^2 stands for years of experience squared, X_i represents the vector of observable characteristics of each individual and ε_i represents the stochastic error. The quadratic function represents, as already pointed out , "years of potential experience" (Lemieux, 2006). Notwithstanding, there are some flaws in Mincer's equations, as the wage was not capturing the experience as if the return of experience years was the same at any education level (Patrinos, 2016). However, when the cost of hiring a new employee is higher than the usual (which depends on the area), firms take into consideration the experience coefficient by capturing it through the equation.

The methodology is based on the Oaxaca-Blinder (1973) decomposition, whose purpose is to find which percentage of the differential in wage is caused by discrimination, that is, the percentage which is considered discrimination is the unexplained part. Furthermore, the equation is estimated for two groups (Blinder, 1973), the advantage group (high-wage group) and the disadvantage group (low-wage group). Men (superscript M) will be considered the advantage group and women (superscript W) the disadvantage group:

$$Y_i^M = \beta_0^M + \sum_{j=1}^n \beta_j^M X_{ji}^M + \mu_i^M \qquad (2)$$

$$Y_i^W = \beta_0^W + \sum_{j=1}^n \beta_j^W X_{ji}^W + \mu_i^W \qquad (3)$$

Consequently, equation (2) is for self-employed men (advantage group), hence, Y_i^M is the log of the self-employed men's wage and equation (3) is for self-employed women (disadvantage group), where Y_i^W represents the log of women's wage. The coefficient vectors are represented by β_0^M and β_0^W and, as it was presented previously, X_{ji}^M and X_{ji}^W represent the vectors of observables characteristics of each individual. The next step, as it was proposed by Blinder (1973), is to subtract the self-employed men's equation (2) from the self-employed women's equation (3), which results in a new equation (4):

$$(\bar{Y}^M - \bar{Y}^W) - \sum_j \beta_j^W (\bar{X}_j^M - \bar{X}_j^W) = \beta_0^M - \beta_0^W + \sum_j \bar{X}_j^W (\beta_j^M - \beta_j^W) + \sum_j (\bar{X}_j^M - \bar{X}_j^W)(\beta_j^M - \beta_j^W) \qquad (4)$$

However, equation (4) is divided into parts, so that the differential is explained by the covariates, the part called "pure discrimination" and the difference of coefficients. $\sum_j \beta_j^W (\bar{X}_j^M - \bar{X}_j^W)$: this is the difference which is explained by the observables characteristics of the groups in the test. This difference is multiplied by the coefficient of the disadvantage group, which results in a weighted equation. In other words, it represents the portion that can be attributed to differences in endowments.

$(\beta_0^M - \beta_0^W)$: this sum of the equation is the "pure discrimination", those coefficients exist just because there are different groups, otherwise there would be one and only β_0 for the whole equation, which represents the intercepts. It is the unexplained difference in wages. When the result of this subtraction is positive it shows how much women's wage are higher than men's.

$\sum_j \bar{X}_j^W (\beta_j^M - \beta_j^W)$: this equation shows the difference of the coefficients multiplied by the experience of the disadvantage group, which shows that the individuals are receiving different payments even when they have the same endowments. To put it simply, it is the existent discrepancy which can be assigned to the difference in the coefficients, also meaning differences in the intercepts. Economists have long been discussing this issue, when a group is undervalued it will result in the other group being overvalued (Jann, 2008).

$$\bar{Y}^M - \bar{Y}^W = (\beta_0^M - \beta_0^W) + \sum_j \bar{X}_j^W (\beta_j^M - \beta_j^W) + \sum_j \Delta \bar{X}_j \beta_j^M \qquad (5)$$

For this reason, it is possible to split equation (5) into two parts: the first one represents discrimination - unexplained wage differential - and the second one represents the difference in endowments - differential explained by positive attributes (Oaxaca and Ransom, 1994).

The unconditional quantile regression method is called RIF-Regression (Recentered Influence Function). The model is similar to the standard regression model, but the dependent variable is replaced by an influence function (Firpo et al., 2009). Thus, the conditional expectation of RIF (Y; v) is modeled as a linear function of the explanatory covariates:

$$E[RIF(Y; v)|X] = X\gamma + \varepsilon \qquad (6)$$

Where the coefficients γ can be estimated by Ordinary Least Squares (OLS).

In the case of the quantile regressions, the RIF $(Y; Q_\tau)$ is equal to $Q_\tau + IF(Y, Q_\tau)$, thus

$$RIF(y; Q_\tau) = Q_\tau + \frac{\tau + 1\{y \le Q_\tau\}}{f_Y(Q_\tau)} \qquad (7)$$

Where $f_Y(.)$ is the density of the marginal distribution of Y, Q_τ is the population τ-quantile of the unconditional distribution of Y and $1\{.\}$ is an indicator function.

Computationally, the density at the point is estimated by kernel methods and the quantile sample $\widehat{Q}_\tau$ is estimated first. In each group the coefficients of the unconditional quantile regression are given by:

$$\hat{\gamma}_{g,\tau} = \left(\sum_{i \epsilon G} X_i X_i\right)^{-1} \sum_{i \epsilon G} \widehat{RIF}\left(Y_{gi}; Q_{g,\tau}\right) X_i \tag{8}$$

where g = A, B.

One can write, for any unconditional quantile, equivalent to the Oaxaca-Blinder decomposition:

$$\hat{R}^\tau = E(X_A)\left(\hat{\gamma}_{A,\tau} - \hat{\gamma}_{B,\tau}\right) + (E(X_A) - E(X_B))\hat{\gamma}_{B,\tau} \tag{9}$$

Thus, $\hat{R}^\tau$ is the total wage difference between the groups in the estimated unconditional quantile. After the = sign, the first part represents the differential not explained by productive attributes (which the literature attributes to discrimination) and the second part is the component of the differential explained by observable productive characteristics.

DATABASE

The database used was the 2015 PNAD (National Household Sample Survey), which is the latest available year. PNAD is provided by IBGE (Brazilian Institute of Geography and Statistics), and is a representative sample of the Brazilian population, it is annual and the survey does not occur only in the years in which demographic censuses occur (every 10 years). The information collected contributes to the analysis of the country's situation and the implementation of public policies. In addition, it offers an insight into the transformations in home structure, socioeconomic conditions, health, aspects linked to housing, migration, fertility, and wages. The population of the final sample consists of 10,476,119 people, represented by a sample of 19,004 self-employed workers.

Of the cuts made in the original database, it should be noted that all the individuals who lacked some information used in the regression were excluded, as well as people under the age of 18 and over 65 years old, and public workers. Information on self-employed workers is presented in table 1 below.

Table 1: Description of the variables

Variable	Description	Whole Sample Mean (Standard Deviation)	Women Mean (Standard Deviation)	Men Mean (Standard Deviation)	t-value
Personal Characteristics:					
Ln wage	Natural logarithm of Wage in hours	1.976 (0.936)	1.801 (0.978)	2.071 (0.866)	-20.156***
Age cohort 1	Age cohort 1: from 18 to 30 years old	0.187 (0.389)	0.194 (0.395)	0.183 (0.386)	1.96**
Age cohort 2	Age cohort 2: from 30 to 40 years old	0.283 (0.450)	0.284 (0.451)	0.281 (0.449)	0.490
Age cohort 3	Age cohort 3: from 40 to 50 years old	0.283 (0.450)	0.286 (0.452)	0.278 (0.448)	1.131
Age cohort 4	Age cohort 4: from 50 to 65 years old	0.247 (0.431)	0.236 (0.424)	0.257 (0.437)	-3.469***
Caucasian	Self-declared Caucasian or Asian	0.445 (0.497)	0.416 (0.493)	0.395 (0.489)	2.941***
Urban	People who live in an urban area	0.926 (0.261)	0.931 (0.253)	0.927 (0.260)	0.997
Metropolitan	People who live in a metropolitan area	0.358 (0.479)	0.436 (0.496)	0.429 (0.495)	0.936

Married	Married/lives with the partner	0.676 (0.468)	0.673 (0.469)	0.667 (0.471)	0.869
TotalKids	Number of kids living in the same house	1.216 (1.112)	1.319 (1.107)	1.144 (1.145)	10.691***
Kid_6	Dummy which indicates if the individual has a kid of the age of 6 or under	0.188 (0.391)	0.187 (0.389)	0.184 (0.388)	0.430
Productive Characteristics:					
Ystudy	Year of study	8.79 (4.076)	9.294 (3.905)	8.217 (4.148)	18.401***
Unionized	Individuals who are unionized	0.063 (0.243)	0.055 (0.228)	0.066 (0.249)	-3.384***
Yexp	Years of experience	26.809 (12.552)	25.429 (12.483)	27.811 (12.519)	-13.125***
Yexp2	Exponential of years of experience	876.309 (701.082)	802.486 (669.684)	930.179 (717.386)	-12.667***
SpecificExp	Specific experience in months	109.856 (109.377)	95.187 (99.974)	121.698 (115.467)	-16.881***
XtraIncome	Non-work extra income	0.045 (0.207)	0.059 (0.237)	0.030 (0.171)	9.924***
Household	Hours of household work	16.885 (13.029)	23.424 (14.019)	10.773 (8.035)	76.816***
CNPJ[a4]	Dummy that indicates whether the company has CNPJ	0.219 0.413	0.219 0.414	0.218 0.413	0.22
Num_employees	Number of employees the company has	0.082 0.452	0.084 0.466	0.081 0.452	0.438

Source: compiled by the authors, based on the 2015 PNAD.
Note: Significance at 1 percent level denoted by ***; significance at 5 percent level denoted by **; significance at 10 percent level denoted by *.

The LNWage variable shows a pro-men wage differential which is statistically significant at 1%. This variable may suffer from measurement errors, since part of the income may be under-reported (Williams, 2012). The percentage of women between 18 and 30 who are self-employed is higher than that of men. It should be noted that women are less likely to be self-employed when wage employment is available (Blanchflower, 2000; Blanchflower et al., 2001; Grilo and Irigoyen, 2006). Younger people are more likely to be self-employed due to their lower risk aversion (Blanchflower and Meyer, 1994; Levesque and Minniti, 2006). In the opposite direction, young people would be less likely to become self-employed because of lesser access to physical capital (Parker, 2004).

The preference for becoming self-employed is variable throughout life and has an inverted U-shape, in which middle-aged individuals (between 25 and 45 years old) are more likely to become self-employed (Bönte et al., 2009; Levesque and Minniti, 2006). In the group of older individuals (50 to 65 years old), the percentage of men is higher than that of women. It is important to point out that the chances of individuals opting for this type of occupation decrease. In addition, this age group is more likely to have accumulated enough experience and financial capital to become self-employed (Parker, 2004). Moreover, the incentives to become self-employed may arise from a scenario of prolonged unemployment or precarious employment as an wage earner (Moore and Mueller, 2002). However, the opportunity cost to be self-employed is high for this age group due to the shorter time for expected return on income (Verheul et al., 2002).

There is no significant difference in the self-employment choice among those men and women who are married, living in the metropolitan area and living in the urban area.

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[4] Short for *Cadastro Nacional da Pessoa Jurídica* in Portuguese, or National Registry of Legal Entities.

Marriage can bring financial stability, giving guarantees so that the partner can take risks to become self-employed (Le, 1999). However, responsibilities resulting from family life, such as child rearing, may increase the risk aversion involved with such occupation.

There is also no statistically significant difference in having children, but the number of children of self-employed women is slightly higher than the number of men. The percentage of self-employed Caucasian women (Caucasian or Asian) was higher than the percentage of men. If among the personal characteristics there are several variables that are statistically identical between the groups, the same does not happen in the professional characteristics (except if the company has CNPJ and the number of employees in the company).

Self-employed women have, on average, an additional year of education. They get extra non-work income and work about 13 hours more at home than their male counterparts. Men have more experience in the labor market (2 years more), more time in the same company (26 months more, on average) and are more unionized.

It is important to note that men in Brazil, on average, drop out of school before women. Young men are more likely to be only in the labor market, which means that they have dropped out of school (Cabanas et al., 2014). At the same time, girls are more likely to stay in school. As young men enter the labor market earlier, consequently, they gain more work experience. This evidence is similar to that found for Germany (Lechmann and Schnabel, 2012). It is different, however, for self-employed women in Cameroon because they have, on average, 2 years more of labor market experience when compared to men (Mbratana and Kenne, 2018). Brazilian women spend more hours on domestic work when compared to men (Madalozzo et al., 2010). The allocation of this time to this type of activity reduces the hours allocated to the labor market (Mbratana and Kenne, 2018)

Some additional covariates are also used in the models: activity cluster of the enterprise, type of occupation (CBO), type of activity (CNAE), and federative unit (UF). These variables are important controls, because the problem of assigning wage differences to discrimination in different activities or occupations is avoided. Another problem is the heterogeneity of Brazilian federative units, which is controlled by dummies. More than 60% of the self-employed sample is in the extractive and civil construction industries or they are workers in the services sector or service providers to the commerce. Self-employed women are preferred by the service sector (70%), while self-employed men work in manufacturing (OECD, 2017).

As mentioned previously, there might be three reasons for this occupational segregation. The first is that the female participation is discontinuous, so it became a pattern, that is, since they are not active in the area they do not try to get in that field. The second reason was the gender roles that society imposes and the third reason is purely discrimination (Kaufman and Hotchkiss, 2006)

4. RESULTS

The results are arranged in two stages: the first one shows a set of 3 regressions using the Oaxaca-Ransom method for the mean – in which the first regression presents a parsimonious model and the last presents a complete model – after the Oaxaca-Ransom decomposition for quantiles, using RIF regressions.

Table 2 presents the results of the Oaxaca-Ransom model, where column (1) contains the estimation of the decomposition in the most common version of the income equation, where the independent variables are: education, labor market experience (in years), experience squared, and specific experience – number of years that the person has

stayed in the same job. Equation (2) contains the same covariates of equation (1), individual variables – ethnicity, age cohort, number of children in the household and whether there are any children up to 6 years old at home, whether they have a spouse –, in addition to dummies of union membership, metropolitan region, urban area, whether the company has CNPJ (National Register of Legal Entities), and the number of employees in the company.

Column (3) of Table 2 shows all the above variables and dummies with the type of affiliation, dummies for each type of occupation, dummies for each type of branch of activity and dummies for each Federative Unit. The total number of observations is 19,004 (9,243 women and 9,761 men), representing 10,476,119 self-employed Brazilians. The total wage differential is 27.79% favorable to men.

Table 2: The Results Difference and Decomposition

	Oaxaca-Ransom		
	(1)	(2)	(3)
Difference			
Prediction 1 (Women)	1.8338*** 0.011	1.8338*** 0.011	1.8338*** 0.011
Prediction 2 (Men)	2.1117*** (0.01)	2.1117*** (0.01)	2.1117*** (0.01)
Difference	-0.2779*** (0.015)	-0.2779*** (0.015)	-0.2779*** (0.015)
Decomposition			
Explained	0.0559*** (0.006)	-0.0825*** 0.011	-0.2108*** (0.012)
Unexplained	-0.3339*** (0.014)	-0.1954*** 0.011	-0.0671*** (0.086)

***p<0.01. Prediction 1 represents the results for women and prediction 2 represents the results for men. Source: compiled by the author, based on the 2015 PNAD.

The most parsimonious model, indicated in column (1), shows that women would earn more than men by 5.59% if there were no unexplained differential. Since there is an unexplained difference of 33.39% in favor of men, the total difference is 27.79%. The model in column (2) shows that other added attributes affect wages, reducing the difference that was previously unexplained by 13.85 percentage points to 19.54%, while the difference explained by the productive attributes is 8.25% in favor of men. The wage gap between self-employed men and women has declined in most countries except for Slovenia, Romania, Italy and Poland (OECD, 2017).

Although self-employed workers work longer hours than wage earners (OECD, 2017), discrimination in the labor market for self-employed workers remains high because of the characteristics related to worked hours, since they need to devote more time to domestic work (Mbratana and Kenne, 2018). Brazilian women spend, on average, almost 13 hours more in domestic activities than men. Both for self-employment in the Brazilian labor market and in the United States, hours dedicated to domestic work negatively impact wages, and this impact is greater for women (Madalozzo and Segantini, 2017). Thus, women are penalized in their income for spending more hours at home than men (Hundley, 2001). The woman is seen as the main responsible for unpaid home work, since the

distribution of time dedicated to domestic and work activities between the genders is unequal in Brazil (Madalozzo and Segantini, 2017). On the other hand, attributes such as having flexible schedules, family situation and aspirations have little impact (Lechmann and Schnabel, 2012).

As can be seen in Table A1, in the lower quantiles, the impact of hours spent on household chores is higher in the first two quintiles, Q10 and Q30, considering that women who are part of the higher quantiles have greater bargaining power to have someone to replace them so that the trade-off between household tasks and work becomes smaller (Soberon-Ferrer and Dardis, 1991).

In turn, education has a positive effect in reducing the wage gap. Women with higher education levels can access better business opportunities (Fujii and Hawley, 1991; Rees and Shah, 1986). The inclusion of women in self-employment over the years has increased, as well as their level of education (Gomes, 2009). Similarly, education affects the occupation that the individual chooses (Aronson, 1991).

The increase in education reduces years of experience in the labor market, reducing the wage gap, however, experience increases it. Therefore, the years which women spend in the labor market gaining specific experience increases the wage differential in self-employment. However, the working life cycle of women is also affected by their reproductive life cycle. A career break due to maternity leave affects their income (Mbratana and Kenne, 2018).

The lower age cohort reduces the wage gap among genders to the .10 and .70 quintiles, although there are negative effects in average terms. The young person has less risk aversion and at the same time has ideas to start a venture. Young people in quintile 0.1 may be being pushed into self-employment while those in quintile 0.7 are being pulled for better business opportunities. In Brazil, there are no wage differences for self-employment in the cohorts of advanced age. These age groups have dependence on previous occupational capital and experience as a characteristic (Caliendo et al., 2014; Van der Zwan et al., 2012).

In addition, they take into account aspects related to the sector and career choices, since they are less capital intensive (Mbratana and Kenne, 2018). Consequently, the level of capital invested is indicated as one of the factors affecting income (Barzel, 1987). Part of the income differential can be justified by the difference in physical capital invested as well as in the difference of human capital acquired by work experience, in addition to specific experience (Hundley, 2001).

The most complete model, which is also used in the quantile analysis, shows that the differential is largely explained by the productive attributes. Of the 27.79% difference, 21.08 percentage points are explained by the covariates and 6.71 are unexplained. In model (2) the difference explained by productive attributes was 8.25% in favor of men, this increase from approximately 13 percentage points to 21.08% in model (3) shows that much of the differential is because self-employed women are in sectors (occupations or branches of activities) that pay less, in addition to the effect of each Federative Unit on the difference. The issue of the quality of employment and income differentials is an important factor in reducing the unexplained difference, the presence of male characteristics in women leads to occupations that have wages 10 percentage points higher and increases the probability of getting jobs with female characteristics in 4.3 percentage points (Drydakis et al., 2018).

Being married affects the hours dedicated to domestic tasks, therefore, the difference of hours dedicated to male work activities is compensated by the extra hours that the woman devotes to domestic activities (Hochschild, 1990). The dissimilarity in hours devoted to household chores in the United States demonstrates that women are still

responsible for unpaid activities, even if they are providers (Bianchi et al., 2000). Although the results are different for married individuals in Brazil, there is evidence that society usually thinks of certain activities as gender-determined (West and Zimmerman, 1987). This goes to show that tradition and cultural patterns play an important role, since there is the belief that each gender must do different activities, in other words, that "men must work and women must take care of the house" (Geist and Cohen, 2011).

Women's determinants in self-employment are usually tied to need and survival because they can not return to the labor market, as well as the need to handle both family life and career (Zouain and Barone, 2009). Thus, although it is a means of returning to or entering the labor market, self-employment is still subject to unexplained differentials of 6.71% in favor of men. The inclusion of occupational choices in model (3) shows that women engage in activities that pay less, a phenomenon known as a glass door (Hassink and Russo, 2010). It explains part of the wage differential between men and women due to differences when entering the labor market, where women are unable to take up more profitable occupations (Bussmann, 2017). Consequently, by reducing existing occupational segregation, the income gap would therefore be reduced (Lechmann and Schnabel, 2012).

Table 3 presents the results of the Oaxaca-Ransom model along the distribution of earnings of men and women through Unconditional Quantile Regression (RIF). The largest total differential is found in quantile 10 and is 48.26%, while the lowest total difference is in the upper tail of the distribution (Q.90), 19.24%. The median of the distribution presents a difference of 24.65% in favor of men.

The differential explained by the productive attributes – such as education, experience, unionization and type of occupation – also has the highest value at the beginning of the distribution (36.47%) and the lowest at the end (10.35%).

Table 3: The Results Difference and Decomposition in the Quantiles

	Q.10	Q.30	Q.50	Q.70	Q.90
	RIF with Oaxaca-Ransom				
Difference					
Prediction 1 (Women)	0.6961	1.4106	1.8218	2.2492	3.0209
Prediction 2 (Men)	1.1787	1.6746	2.0683	2.5182	3.2133
Difference	-0.4826*** (0.025)	-0.2639*** (0.016)	-0.2465*** (0.016)	-0.269*** (0.017)	-0.1924*** (0.03)
Decomposition					
Explained	-0.3647*** (0.02)	-0.2135*** (0.013)	-0.1964*** (0.013)	-0.2116*** (0.015)	-0.1035*** (0.03)
Unexplained	-0.1179*** (0.016)	-0.0504*** (0.009)	-0.0501*** (0.01)	-0.0574*** 0.011	-0.0889*** (0.023)

***p<0.01, **p<0.05, *p<0.1. Prediction 1 represents the results for women and prediction 2 represents the results for men. Source: compiled by the author, based on the 2015 PNAD.

The differential component attributed to discrimination (not explained by observable productive factors) has its peak at the beginning of the distribution (11.79%), while the lowest value is in the median (5.01%). There is an increase in the difference attributed to discrimination of 3.15 percentage points from q.70 to q.90, showing that

among self-employed workers with greatest incomes, the unexplained component plays a major role. The differential decrease in the upper tail of the distribution goes in the same direction as the literature, since women with a higher educational level – the majority among the most well paid – have a greater perception of discrimination and tend to be more resistant to it (Ahmed and McGillivray, 2015; Chi and Li, 2008).

Tables A1 and A2 of the appendix present the variables of the explained part and the unexplained part of the differential. It is possible to observe that education reduces explained (along the entire distribution) and unexplained (in part of the distribution) differentials. This is due to that fact that women study more. As for discrimination by race, however, education exacerbates the problem, since Caucasian individuals, on average, have greater access to better education, increasing the explained and unexplained income differential (Frio and Fontes, 2018). Education, however, is still a fragile measure, since it does not perfectly capture the intrinsic ability of the individual and the quality of education as well as school performance, so they are not measured (Ramamurthy and Sedgley, 2019).

FINAL CONSIDERATIONS

Self-employment has been an alternative for minority groups (such as young people, immigrants) to enter the labor market, as well as for women. Choosing this type of occupation is a way to avoid discrimination from the employer. In addition, it can be chosen out of necessity, because of the flexible hours, or as an alternative to unemployment, as well as a business opportunity. The literature shows that, contrary to expectations, there is a gender-motivated wage differential within self-employment. The wage differential between men and women is widely debated in Brazilian and world literature. What is called discrimination is unequal treatment, in the case of wages, for people with similar productive endowments.

Thus, this article tested the hypothesis that there are wage differentials explained and unexplained in self-employment between men and women. In order to test the hypothesis, the Oaxaca-Ransom decomposition was used in the mean and along the distribution (with the use of Unconditional Quantile Regressions - RIF).

The average differential is of 27.79% in favor of men. The most parsimonious model – using Mincer's income equation – shows that women have 33.39 percentage points of unexplained differential – while the most complete model shows that this difference drops to 6.71 percentage points. The drop shows that women seek self-employment in federative units that pay less and in less privileged occupations, when compared to men. This last explanation is the effect known as a glass door, in which women find it difficult to enter the labor market in better paid occupations. The overall average difference between self-employed men and women is 27.79%, which can be mostly explained by the fact that women work, on average, 13 extra hours a week in unpaid household chores.

Other effects are due to factors such as experience, because they enter the labor market later. Part of that explanation has to do with years of education, which is higher among them. However, young women also have a higher chance of not studying or working compared to male peers in the same age group. Thus, the wage differential between men and women is higher in the lower quintiles.

The use of self-employment for women to enter the labor market would be encouraged through the recent deregulation of labor laws. Despite its beneficial nature, however, there would be an increase in the gender wage differential, especially for those in the lower income quintiles. Therefore, they are pushed towards self-employment. Thus, it

would be necessary to improve their productive characteristics such as education, as well as encourage their entry into sectors belonging to the technological areas. There should be policies that allow for smaller fluctuations in the labor market, such as a shared maternity leave between men and women or greater access to day care centers. These factors would make it possible to gain specific experience in the occupation, as well as to spend less time away from the job market to take care of children.

There should be a proposal to subsidize unemployed women with a view to starting their own business in a way that helps them run their own enterprise. Such actions can take place in business programs in public universities throughout the country, helping to structure the new enterprise in order to reduce the rate of bankruptcy and withdrawal, since the percentage of women entrepreneurs dropouts is at 42% (Zouain and Barone, 2009).

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Table A1: Explained Differential

Variable	Mean	Q.10	Q.30	Q.50	Q.70	Q.90
Ystudy	0.0423***	0.0655***	0.0434***	0.0411***	0.0362***	0.037***
	(0.003)	(0.005)	(0.003)	(0.003)	(0.003)	(0.004)
Yexp	-0.0166**	-0.0467***	-0.0349***	-0.0138	-0.0104	-0.0169
	(0.008)	(0.016)	(0.009)	(0.008)	(0.009)	(0.016)
Yexp2	0.0255***	0.0633***	0.043***	0.0202	0.0152**	0.0324**
	(0.007)	(0.015)	(0.008)	(0.007)	(0.008)	(0.014)
SpecificExp	-0.014***	-0.0198***	-0.0188***	-0.0191	-0.0148***	-0.0107*
	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.004)
Age cohort 1	-0.0044**	0.1769*	0.0486	0.0481	0.2145***	0.2644
	(0.002)	(0.093)	(0.045)	(0.053)	(0.082)	(0.171)
Age cohort 2	-0.0004	0.0433	0.0121	0.0127	0.051	0.0642
	(0.001)	(0.074)	(0.026)	(0.029)	(0.083)	(0.118)
Age cohort 3	-0.0001	0.0208	0.0058	0.006	0.0249	0.0308
	(0.000)	(0.073)	(0.025)	(0.027)	(0.083)	(0.115)
Caucasian	0.0022***	0.0031***	0.0023	0.0019***	0.0024***	0.0023**
	(0.001)	(0.001)	(0.001)	(0.0007)	(0.0008)	(0.001)
Urban	0.0004	0.0011	0.0005	0.0003	0.0000	0.0001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.0003)
Metropolitan	0.0006	0.0004	0.0004	0.0003	0.0004	0.0011
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)
Unionized	-0.0000	0.0017*	0.0004	0.0002	-0.0006*	-0.0023
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
XtraIncome	0.0034***	-0.0006	0.0012	0.0027**	0.0043***	0.0098***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.03)
Married	0.0001	0.0000	0.0001	0.0001	0.000	0.0001
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Household	-0.0648***	-0.0902***	-0.0623***	-0.0458***	-0.0562***	-0.054***
	(0.007)	(0.014)	(0.008)	(0.008)	(0.008)	(0.016)
TotalKids	-0.0044***	-0.0063***	-0.0062	-0.0041***	-0.0043***	-0.0029
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Kid_6	0.0000	-0.000	-0.000	0.0000	0.0000	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CNPJ	-0.0007	-0.000	-0.0005	-0.0007	-0.0008	-0.0009
	(0.002)	(0.000)	(0.001)	(0.002)	(0.002)	(0.002)
No. employees	0.0000	-0.000	0.0000	0.0000	0.0000	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_CBO	YES	YES	YES	YES	YES	YES
D_CNAE	YES	YES	YES	YES	YES	YES
D_UF	YES	YES	YES	YES	YES	YES
D_GAE	YES	YES	YES	YES	YES	YES

Source: compiled by the author, based on the 2015 PNAD.

Table A2: Unexplained differential

Variable	Mean	Q.10	Q.30	Q.50	Q.70	Q.90
Ystudy	0.092***	0.0697*	0.0241	0.0133	0.04**	-0.0288
	(0.035)	(0.036)	(0.02)	(0.02)	(0.02)	(0.034)
Yexp	-0.0776	0.0333	-0.0884	-0.0614	0.0316	-0.003
	(0.159)	(0.154)	(0.085)	(0.081)	(0.083)	(0.151)
Yexp2	-0.0173	-0.0426	-0.0115	0.0124	-0.0301	-0.0012
	(0.086)	(0.082)	(0.046)	(0.043)	(0.043)	(0.075)
SpecificExp	0.0039	0.0209*	0.0004	-0.0102	-0.0096	-0.0045
	(0.014)	(0.012)	(0.007)	(0.007)	(0.007)	(0.013)
Age cohort 1	-0.0212	-0.0306***	-0.0214***	-0.0161**	-0.0156**	-0.044***
	(0.016)	(0.012)	(0.007)	(0.006)	(0.007)	(0.012)
Age cohort 2	-0.0188	-0.0273**	-0.012	-0.0271***	-0.0336***	-0.0521***
	(0.018)	(0.014)	(0.009)	(0.006)	(0.009)	(0.016)
Age cohort 3	-0.0126	-0.0378**	-0.005	-0.0151*	-0.0236***	-0.057***
	(0.013)	(0.015)	(0.009)	(0.009)	(0.009)	(0.018)
Caucasian	0.002	0.0091	-0.0006	-0.0041	0.0034	-0.0118
	(0.012)	(0.011)	(0.007)	(0.007)	(0.0078)	(0.014)
Urban	0.1501***	0.2034***	0.0703***	0.0606**	0.0259	-0.014
	(0.046)	(0.056)	(0.027)	(0.024)	(0.023)	(0.032)
Metropolitan	0.016	0.0138	0.0015	0.0025	0.0047	0.018
	(0.01)	(0.009)	(0.006)	(0.006)	(0.007)	(0.013)
Unionized	-0.0072**	-0.0108***	-0.0049**	-0.002	-0.0018	-0.0046
	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)	(0.004)
XtraIncome	0.0004	-0.0021	-0.0025**	-0.0007	0.0013	0.0005
	(0.003)	(0.056)	(0.001)	(0.001)	(0.002)	(0.004)
Married	-0.0108	-0.0075	-0.0069	-0.0107	0.0083	0.0019
	(0.019)	(0.016)	(0.01)	(0.01)	(0.01)	(0.018)
Household	0.0239	-0.0149	-0.0073	0.0133	0.0162	0.025
	(0.018)	(0.016)	(0.009)	(0.01)	(0.01)	(0.02)
TotalKids	0.0036	-0.0015	-0.0078	0.0101	0.0069	0.009
	(0.015)	(0.013)	(0.007)	(0.007)	(0.007)	(0.013)
Kid_6	0.0078	-0.0016	0.0052	0.0011	-0.0002	0.0038
	(0.007)	(0.005)	(0.003)	(0.003)	(0.003)	(0.006)
CNPJ	-0.0077	-0.0054	-0.0011	-0.0083	-0.0115*	-0.0198
	(0.007)	(0.006)	(0.005)	(0.005)	(0.006)	(0.012)
No. employees	-0.0023	-0.0014	-0.0022	-0.0026	-0.0035*	0.0018
	(0.007)	(0.002)	(0.001)	(0.002)	(0.002)	(0.004)
D_CBO	YES	YES	YES	YES	YES	YES
D_CNAE	YES	YES	YES	YES	YES	YES
D_UF	YES	YES	YES	YES	YES	YES
D_GAE	YES	YES	YES	YES	YES	YES

Source: compiled by the author, based on the 2015 PNAD.