

Decomposing wage differences in Brazilian regions: a revised insight about traditional discrimination

Wage
differences
in Brazilian
labor market

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Izabel Faustino

State University of Londrina, Londrina, Brazil

Katy Maia

Universidade Estadual de Londrina, Londrina, Brazil

Magno Rogerio Gomes

*Department of Economia, Universidade Estadual de Londrina, Londrina, Brazil and
Department of Economia, Universidade Pitágoras Unopar, Londrina, Brazil*

Paulo Mourao

Department of Economics and NIPE, University of Minho, Braga, Portugal, and

Elisangela Araujo

Universidade Estadual de Maringá (UEM), Maringá, Brazil

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Abstract

Purpose – This paper analyzes the issue of wage differentials and gender discrimination in the Brazilian labor market.

Design/methodology/approach – The methodology is based on the log-linear equation model by Mincer (1974) and the decomposition method by Oaxaca (1973) and Blinder (1973) and was estimated using data from the National Household Sample Survey (PNAD).

Findings – The main results indicate that there was a reduction in wage differentials and gender discrimination in the majority of regions in Brazil for white workers when comparing the available years. However, for non-white workers, the degree of discrimination increased in Brazil, especially in the central-west and southeast regions. Overall, wage decompositions have suggested that women suffer from wage discrimination.

Originality/value – This is the first paper detailing wage discrimination across the different Brazilian regions and also controlling for usual dimensions like gender and race.

Peer review – The peer review history for this article is available at: <https://publons.com/publon/10.1108/IJSE-09-2021-0569>.

Keywords Brazilian labor market, Wage discrimination, Gender

Paper type Research paper

1. Introduction [1]

Since the final decades of the 20th century, and especially at the beginning of the 21st century, a series of movements have emerged throughout the world in the construction of an agenda to effectively diminish gender and racial inequality.

Although these advances are extremely relevant to the country, vast challenges in this field still remain. According to an [IPEA study \(2017\)](#), gender and racial inequality is still one of the most salient characteristics of the Brazilian economy. Among the Brazilian women who



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participate in the labor market [2], a substantial percentage are the breadwinners (34% or about 1/3 of the households), and 53.6% are non-white; although they tend to have higher education levels than men, these women are inserted in the most vulnerable segments of the economy and more subject to problems such as unemployment and difficult schedules. Brazil, as a country with continental dimensions, faces enormous regional inequalities that aggravate wage differences. There are a few studies that address regional differences in this regard. [Maia et al. \(2019\)](#) examined salary differences and discrimination by gender and color in the five Brazilian regions in 2002 and 2013. The results showed that the highest wage returns were in the southeast, south, and midwest regions. During this period, discrimination was lowest in the north and greatest in the central-west, with demonstrable growth in the southeast, south, and central-west and a fall in the northeast and north. Therefore, it is relevant to research and detail wage differences and discrimination by gender and color throughout Brazil to assist in regional public policies.

In the light of the above, the objective of this article is to investigate wage differentials and the incidence of gender discrimination in the labor market in Brazil and in Brazilian macro regions, based on data from the National Household Sample Survey (PNAD) in the years 2004 and 2014. Specifically, it seeks to detail the profile of wage differences and discrimination as an important means to effectively combat their causes, since similar policies could lead to different results given the heterogeneity of the productive structures and the economical, educational, and social characteristics of each region.

The empirical methodology used in this research is based on the log-linear equation model proposed by [Mincer \(1974\)](#) for the determination of wages and the wage decomposition method by [Oaxaca \(1973\)](#) and [Blinder \(1973\)](#). This methodology has been used to measure the wage differences explained by the productive characteristics, segmentation (occupations, sectors, formality, census situation, regions), and discrimination.

The structure of this article is as follows: After this introduction, [Section 2](#) presents the theoretical framework explaining the income differentials based on the human capital theory and discusses the critical approaches of this theory. [Section 3](#) presents an overview on the labor market in Brazil to specify the context that will serve as a background for the investigation of the hypothesis of the existence of gender and color discrimination in Brazil and its macro regions. [Section 4](#) describes the methodology adopted, as well as the data source and the results of the Mincerian regressions and the Oaxaca-Blinder decomposition, followed by [Section 5](#), which discusses the political implications. Finally, the last section examines the main conclusions of this research.

2. Labor market and discrimination: theoretical and conceptual aspects

The socio-economic dimensions determining the salaries of individuals and their income differentials were first explained by the pioneering analyses of [Schultz \(1961\)](#), [Becker \(1964\)](#), and [Mincer \(1974\)](#) through the theory of human capital.

The fundamentals of the human capital theory are based on the traditional (neoclassical) economy and defend the idea that there is a direct relationship between labor productivity and the income received by the worker, being directly linked to the investments made in the acquisition of human capital.

Thus, for the human capital theory, income differences between individuals can be explained by education, especially formal education. However, the expected earnings due to the accumulation of educational skills are significantly conditioned by gender, ethnicity, age, or even their birthplace or workplace.

The theory of segmentation considers that the labor market is divided into two non-competitive sectors, namely a primary and a secondary sector. In the primary sector, relevant characteristics are higher salaries, stability in employment, good working conditions, and career advancement opportunities. In turn, in the secondary sector, low wages, job instability, poor working conditions, and lack of prospects for professional growth prevail. While the

primary sector predominates in the manufacturing industry and service sector, the secondary market is characteristic of small companies with little access to capital and technology (Cacciamali, 1978; Lima, 1980).

In this approach, the initial allocation of the workers will define the evolution of their personal characteristics and their future insertions in the labor market. Discrimination factors are included as a cultural focus, thus wage inequality, for example by gender, would result from a workforce allocation that preferentially selects women for less attractive careers in the secondary market. The primary market, which is more stable and reliable, would be tended to be dominated by the male workforce (Ometto, 2001).

Among the main economic theories of discrimination, we highlight discrimination by personal bias, elaborated by Becker (1957). According to Borjas (2012), the theory of discrimination is based on the concept of “cherish discrimination,” the idea that some individuals may simply prefer not to interact with other groups. This concept reflects the notion of prejudice against certain groups and can occur from three different segments of the economy, namely employers, employees, and consumers.

After these considerations on the theory of human capital as well as the critical aspects of this approach, we consider essential a discussion of the labor market in Brazil for a deepened insight into the focus of our work. We will firstly detail the Brazilian wage discrimination by gender and color in the country and its regions.

3. Brief overview of the Brazilian labor market (2004–2014) [3]

In the period 2004–2014, the labor market showed a favorable performance in terms of occupations, generation of jobs, increase of wages, and a significant reduction of informality. Among the main explanatory factors of this trajectory, one must recognize the adoption of transfer policies after 2003, which emphasized a productive inclusion, thus allowing the population of the lower classes to reach economic inclusion through higher levels of employment (Lúcio, 2015).

The percentage variation in the number of people working or looking for work, called the Economically Active Population (EAP), increased by 14.68% for men and 19.45% for women [4] during this period. The population that was not employed or seeking employment also significantly increased, with a percentage variation of approximately 42.88% in the male group and 24.44% in the female group (PNAD, 2004 and 2014). The increase in the number of inactive people can be explained in part by the decrease in the participation of young people aged 18 and younger in the labor market due to the increase in employment and income of other family members, as pointed out by Lúcio (2015).

Table 1 shows the proportion of the Economically Active Population, Occupied Population, as well as the inactivity and unemployment rates in Brazil in 2004 and 2014. It can be noted in Table 1 that the proportion of the EAP decreased in the period analyzed for all groups of workers. However, the participation of workers in the employed population

Indicators Years	EAP		Occupied population		Inactivity rate		Unemployment rate	
	2004	2014	2004	2014	2004	2014	2004	2014
Men	80.24	76.53	92.04	93.71	19.75	23.47	7.64	6.29
Women	56.51	55.50	85.59	89.33	43.49	44.50	12.05	10.67
White men	79.02	75.16	92.85	94.38	20.98	24.84	6.89	5.62
Non-white men	81.54	77.62	91.19	93.17	18.46	22.38	8.42	6.83
White women	55.46	54.73	87.44	91.19	44.54	45.27	11.47	8.81
Non-white women	57.75	56.19	83.41	87.65	42.25	43.81	14.62	12.35

Source(s): Prepared by the authors based on PNAD data for 2004 and 2014

Table 1.
Proportion of the
economically active
population, occupied
population, inactivity
rate, and
unemployment rate in
Brazil in 2004 and 2014

increased, especially for non-white women (4.24 percentage-points, p.p.). The inactivity rate [5] increased mainly for the non-white men (3.92 p.p.) in the period and the unemployment rate in Brazil fell more for white women (2.66 p.p.).

It is also worth noting that the participation in the EAP in both years was higher for non-white male workers, and the participation of the employed workers was especially significant for white men. White women had a higher inactivity rate, and non-white women were more affected by unemployment.

Table 2 shows the proportion of employed people and the unemployment rate by region. In the north, the proportion of employed men in the period decreased, with non-white men standing out. The unemployment rate in this region only declined for white women [6]. In the other regions, there was an increase of the employed population and a reduction in the unemployment rate for all categories of workers. The percentage of employed men in the southeast and employed women in the south increased.

However, higher female education did not guarantee a higher salary in relation to men during the considered period. White men continued to show the highest average wages, while non-white women had the lowest average. The increase in the average salary for all workers was more significant for workers living in the northeast (Figure 1). It should be noted that the southeast region had the highest salary level, and the northeast region had the lowest level.

Nevertheless, regional differences in Brazil are still notorious (Figure 1). The next section will describe the methodology used to measure the wage gap and discrimination in the labor market in Brazilian regions.

Recent literature has been published in this concrete topic. Gomes and Souza (2018) empirically analyzed salary asymmetries by gender in the south and northeast regions of Brazil, according to admission to formal employment and sectors of economic activity. With RAIS data from 2016 (Relation Annual Social Information of the Ministry of Labor and Employment), the authors adapted the Oaxaca-Blinder decomposition, and showed in their results: (1) gender discrimination against women; (2) minor gender pay gaps and discrimination for hired workers in the first job and in commerce and (3) double discrimination of women in agriculture and industry, both in occupational insertion and in wages, intensified in industry. The authors also

Proportion of employed population										
Regions	North		Southeast		South		Central-west		Northeast	
Years	2004	2014	2004	2014	2004	2014	2004	2014	2004	2014
Men	94.80	94.07	90.47	93.11	95.28	96.13	94.54	96.32	91.71	92.58
Women	85.74	86.76	84.65	89.10	93.18	93.99	88.59	92.43	84.01	87.00
White men	94.91	93.79	91.36	93.66	91.01	96.54	95.23	96.50	92.68	92.58
Non-white men	94.76	94.14	89.13	92.55	86.80	94.93	94.04	96.22	91.33	92.58
White women	84.91	88.62	86.29	90.38	91.01	94.33	89.69	93.57	85.92	88.69
Non-white women	86.06	86.16	82.06	87.66	86.80	92.86	87.71	91.65	83.16	86.37

Unemployment rate										
Regions	North		Southeast		South		Central-west		Northeast	
Years	2004	2014	2004	2014	2004	2014	2004	2014	2004	2014
Men	5.00	5.69	9.17	6.63	4.94	3.76	5.28	3.57	7.87	7.05
Women	12.46	11.76	14.05	10.04	8.78	3.36	10.22	6.98	13.88	11.54
White men	4.93	5.96	8.34	6.13	4.57	4.88	4.62	3.41	6.95	7.12
Non-white men	5.02	5.62	10.42	7.15	6.61	5.55	5.75	3.66	8.24	7.03
White women	13.58	10.34	12.68	8.89	8.21	5.26	9.35	5.89	12.39	10.18
Non-white women	12.04	12.21	16.18	11.32	11.69	6.50	10.90	7.57	14.54	12.04

Table 2. Proportion of employed population and unemployment rate by gender and color in Brazilian macro regions in 2004 and 2014

Source(s): Prepared by the authors based on PNAD data for 2004 and 2014

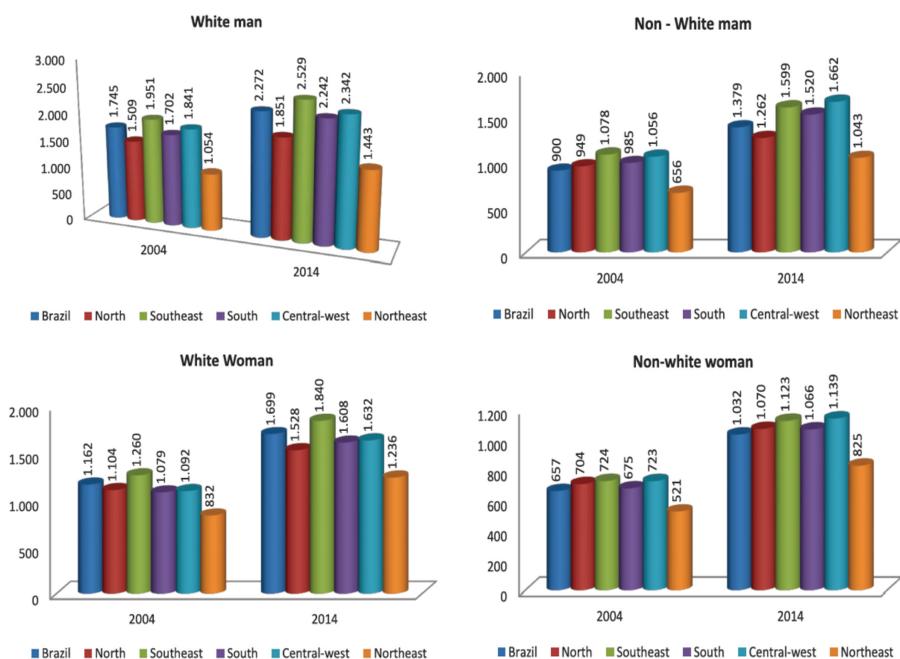


Figure 1. Average salary, in Brazilian currency units (“Reais”), by gender and color in Brazilian macro regions (2004 and 2014)

Note(s): 2004 salary was inflated to the accumulated values from 2014. Values in Brazilian Reais

Source(s): Prepared by the authors based on PNAD data for 2004 and 2014

observed that the northeast showed less gender pay discrimination compared to the south. This result shows greater homogeneity wage in less economically developed region in Brazil.

Another recent study on subject is the [Gonçalves et al. \(2021\)](#), which examined wage differences and gender discrimination and color of the employed population in the states of Paraná and Pernambuco, in Brazil, in 2005 and 2015, through the PNAD/IBGE microdata. The methodology was based on the profile description population, in the Mincerian equations and in the Oaxaca-Blinder wage decomposition between white men, non-white men, white women and non-white women. The results showed discrimination by gender and color in both states. Although gender discrimination has increased among non-whites and reduced among whites in the two states during this period, the greatest discrimination by gender and color was among white men and non-white women in both states, but the largest it was in Paraná.

Regarding the periodicity of the data used in this research (2004–2014), it is worth noting that the option for this period was due to two factors: firstly, because there was a change in the PNAD methodology which ended in 2015. As 2015 was an atypical year in Brazil, the preference was to use the year 2014, in order to maintain homogeneity of the Brazilian economic indicators. Second, the new survey in effect since then – the continuous PNAD – which provides data from 2012 onwards, is different in methodological terms and even, in terms of frequency (now it has changed to quarterly data). It has also comprised quite different phases, alternating periods of strong improvement with periods of deterioration of the Brazilian labor market. The combination of these forces led us to maintain the analysis period of 2004–2014 (without neglecting the potentiality of further researches considering an enlarged period of observations).

4. Methodology, database, and decomposition results

As we have already stated, in this work we want to provide an original analysis of Brazilian wage differentials considering a macro-regional insight. This section presents the database used and its sources. We will also detail the methodology used, the decomposition method by [Oaxaca \(1973\)](#) and [Blinder \(1973\)](#), to investigate the wage differences that can be explained and unexplained by the personal characteristics of the workers.

4.1 Database

The data for this research were collected through the National Survey by Household Sample Survey (PNAD) from 2004 to 2014, available from the Brazilian Institute of Geography and Statistics (IBGE). The sample consisted of the employed population aged 14 years and over with positive remuneration in the reference week.

4.2 Wage determination and decomposition equations by Oaxaca and blinder

To comply with the proposed objective, we estimated the wage determination equations of the Mincerian type and applied the results of the estimates to the decomposition method by [Oaxaca \(1973\)](#) and [Blinder \(1973\)](#).

The Mincerian equation can be described as explaining the wage observed for each individual i due to a set of explicative factors:

$$\ln Y_i = \beta_0 + \beta_1 educ_i + \beta_2 exp_i + \beta_3 exp_i^2 + \gamma' X_i + \varepsilon_i \quad (1)$$

Where $\ln Y_i$ is the logarithm of the salary received by individual i ; $educ_i$ represents the years of study; exp_i is the experience; exp_i^2 is the experience squared; X_i is a vector of observable characteristics of the individual; and ε_i is the stochastic error.

The dependent variable is the logarithm of the average hourly wage of persons employed in the main activities of the reference week. Following the literature ([Fiuza-Moura, 2015](#); [Maia et al., 2017](#)), the categorical variables used in the model were related to educational dimensions (five categories), insertion in the labor market (two categories), occupation (four categories), economic sectors (three categories), demography (two categories), and location of work (six categories). Next, we will specify the categories of each variable:

- (1) Educational—zero to three years of study (base category), four to eight years of study, 9–11 years of study, 12–14 years of study, and 15 years of study or more.
- (2) Insertion in the labor market—formal and informal (base category)
- (3) Occupation—managers, science and arts professionals, mid-level technicians, and operational staff (base category)
- (4) Sectors of economic activities—agricultural (base category), services, and industry
- (5) Demography—urban and non-urban (base category)
- (6) Location—north, southeast, south, midwest, northeast (base category) and federal district.

Applying the Mincer equation to the groups at advantage and disadvantage, according to [Blinder \(1973\)](#) we have:

$$\text{Group at advantage: } Y_i^H = \beta_0^H + \sum_{j=1}^n \beta_j^H X_{ji}^H + u_i^H \quad (2)$$

$$\text{Group at disadvantage: } Y_i^L = \beta_0^L + \sum_{j=1}^n \beta_j^L X_{ji}^L + u_i^L \quad (3)$$

Where: Y_i^H is the natural logarithm of the yield of the advantageous group, and Y_i^L represents the natural logarithm of the yield of the disadvantageous group; β_0^H e β_0^L are the vectors of coefficients; and X_{ji} represents the characteristics of the individuals.

Subtracting (2) from (3) gives the following:

$$\begin{aligned} (\bar{Y}^H - \bar{Y}^L) - \sum_j \beta_j^L (\bar{X}_j^H - \bar{X}_j^L) &= (\beta_0^H - \beta_0^L) + \sum_j \bar{X}_j^L (\beta_j^H - \beta_j^L) \\ &+ \sum_j (\bar{X}_j^H - \bar{X}_j^L) (\beta_j^H - \beta_j^L) \end{aligned} \quad (4)$$

In equation (4), the terms are:

$\sum_j \beta_j^L (\bar{X}_j^H - \bar{X}_j^L)$ —shows the differences explained by the characteristics between the groups analyzed, weighted by the value given to the same characteristics for the reference group.

$\sum_j \bar{X}_j^L (\beta_j^H - \beta_j^L)$ —corresponds to the wage differential arising from differences in slope coefficients when individuals are valued differently with the same appropriations.

$(\beta_0^H - \beta_0^L)$ —refers to the unexplained wage gap from the difference of the intercepts (direct discrimination). This term occurs solely because the individual belongs to a certain group. A positive difference refers to how much more the reference group is paid than another group.

The wage difference arising from the discrimination corresponds to the portion referring to the effect of the intercepts added to the part attributed to the differential of the coefficients: $(\beta_0^H - \beta_0^L) + \sum_j \bar{X}_j^L (\beta_j^H - \beta_j^L)$. The interaction term $\sum_j (\bar{X}_j^H - \bar{X}_j^L) (\beta_j^H - \beta_j^L)$ was not used in this study since [Blinder \(1973\)](#) has no economic value. According to [Jann \(2008\)](#), the method that aligns with the term interaction is called twofold, which differs from the Oaxaca method by considering the intercept coefficient.

The model was applied to measure gender wage differences [\[7\]](#) between the white and non-white population and regions in Brazil in 2004 and 2014. The results of the wage decomposition will be presented in the form of coefficients (direct result of the decomposition) and in the exponential form. The second form shows the impact of the difference on women's wages [\(Jann, 2008\)](#).

4.3 Analysis of the decomposition of wage differentials and discussion of results

4.3.1 *The decomposition of the wage differential between white men and white women.* Before analyzing the data, it is important to clarify the following insight: positive values show the contribution of each term to the increase in the gender wage differential, and negative values relate to the respective contribution to the reduction of the differential.

[Table 3](#) presents the results of the decomposition of the wage differential between white men and white women in all of Brazil, one of our most relevant outcomes. It can be noted that there was a significant drop in the wage gap in the period analyzed. The difference in wage log was 0.1366 in favor of men in 2004 and 0.1079 in 2014. The exponential coefficient for white men was 6.07 for 2004 and 9.30 for 2014, while for white women it was 5.30 and 8.36, respectively.

It is also worth noting that equalization would have occurred if the hourly wage of the white women had been readjusted by 12.98% and 11.40%, respectively, in 2004 or 2014.

Let us move to one of the original findings of this work. The part explained by the productive aspects (experience and years of study) and by variables related to the segmentation of jobs contributed to reducing the gender wage gap among the white working population of Brazil. The share of the differential attributed to discrimination, which corresponds to the differences of the coefficients of slope, indicates that, in the absence of discrimination, the wages of white women in Brazil would have increased by 33.15% in 2004 and 31.70% in 2014. The full Oaxaca-Blinder decomposition for difference of salaries between white men and white women in Brazilian regions can be seen in Table 4.

Based on Table 4, the northern region presented the smallest difference in wages between the white male and female groups. Therefore, to equalize white workers' salaries in the north, wages for women should have been adjusted by 10.43% in 2004 and 4.09% in 2014. These values are significantly lower than the generality of the equivalent values for the other regions in Table 4. The north and northeast regions are the poorest in Brazil, with the majority of the population being non-white. It is observed that these regions showed a reduction in discrimination by gender. An additional explanation refers to the fact that this region is one of the Brazilian regions with the lowest average wages – almost half of the population only earns up to ½ minimum wage per capita, with a small portion earning more than two minimum wages (about 7%) which can contribute to explain this low gender inequality among the white population (Garcia, 2019). On the other hand, in the richest regions of the country (southeast, south and central-west), with the majority of the white population, there was an increase in gender discrimination. These results indicate that in richer regions, with a more educated population (more qualified labor), competition in the labor market is greater, which can result in greater discrimination.

On the other hand, the southeastern and central-west regions presented the largest wage difference in the period. The same payment would occur if, in the southeast, women's hourly wages were increased by 21.08% and 16.02% in 2004 and 2014 respectively. In the midwest, the readjustment for equality would be 20.29% and 19.05%, respectively, and in the south, gender wage equality would occur if the female average wage increased by 17.21% in 2004 and 14.45% in 2014. In relation to the northeast, we found stimulating evidence – the wage discrepancy by gender among white individuals is negative, that is, the average white woman earns more than the man with the same skin color. Thus, the same payment would occur if the salary of the northeastern women were reduced by 5.44% in 2004 and 3.01% in 2014.

Across the country, the difference explained by the productive endowments and characteristics of jobs and housing was negative, that is, it acted to reduce the wage differential by gender. This effect, in both years examined, was less evident in the southeast.

Years Groups	2004		2014	
	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
White men	1.80*	6.07*	2.23*	9.30*
White women	1.67*	5.30*	2.12*	8.36*

Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.1625*	-16.00*	-0.1675*	-15.42*
Discrimination	0.2991*	33.15*	0.2754*	31.70*
Total Difference	0.1366*	12.98*	0.1079*	11.40*

Table 3.
Decomposition by
Oaxaca-Blinder for
wage differences
between white men and
white women, Brazil,
2004 and 2014

Note(s): (*) significance at 1%

Source(s): Prepared by the authors, based on PNAD data for 2004 and 2014

North				
Years	2004		2014	
Groups	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
White men	1.45*	5.53*	2.08*	8.02*
White women	1.39*	5.02*	2.04*	7.71*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.1420*	-13.24*	-0.2205*	-19.79*
Discrimination	0.2412*	27.28*	0.2606*	29.76*
Total difference	0.0992*	10.43*	0.0401*	4.09*
Southeast				
Years	2004		2014	
Groups	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
White men	1.96*	7.10*	2.35*	10.49*
White women	1.77*	5.86*	2.20*	9.04*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.0985*	-9.38*	-0.1248*	-11.73*
Discrimination	0.2897*	33.60*	0.2734*	31.44*
Total difference	0.1913*	21.08*	0.1486*	16.02*
South				
Years	2004		2014	
Groups	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
White men	1.84*	6.29*	2.28*	9.77*
White women	1.66*	5.28*	2.14*	8.53*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.1354*	-13.49*	-0.1390*	-12.98*
Discrimination	0.3109*	36.46*	0.2740*	31.52*
Total difference	0.1754*	17.21*	0.1350*	14.45*
Central-West				
Years	2004		2014	
Groups	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
White men	1.81*	6.09*	2.28*	9.74*
White women	1.62*	5.06*	2.10*	8.19*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.1498*	-13.92*	-0.1333*	-12.48*
Discrimination	0.3346*	39.74*	0.3077*	36.03*
Total difference	0.1847*	20.29*	0.1744*	19.05*

(continued)

Table 4.
Decomposition of
Oaxaca-Blinder for
wage differences
between white men and
white women in the
regions of Brazil, 2004
and 2014

Northeast Years Groups	2004		2014	
	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
White men	1.20*	3.33*	1.75*	5.77*
White women	1.25*	3.57*	1.78*	5.91*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.3798*	-31.60*	-0.3079*	-26.50*
Discrimination	0.3239*	38.25*	0.2773*	31.96*
Total difference	-0.0560*	-5.44*	-0.0306*	-3.01*

Note(s): (*) significance at 1%
Source(s): Prepared by the authors, based on PNAD data for 2004 and 2014

Table 4.

In comparative terms, the central-west region was the one that presented the highest degree of discrimination, while the north region, the lowest. If there were no discrimination, the salary of the central-west woman would rise by 39.74% in 2004 and in the north by 27.28% in 2014; the impact would be 36.06% and 29.76 respectively. It should also be noted that in the northeast, despite the fact that the average wage gap between white women and white men is favorable to men, it was found that there is wage discrimination against women. Thus, in the absence of discrimination, the wages of women in the northeast would increase by 38.25% in 2004 and 31.96% in 2014.

Figure 2 below illustrates the results of the wage inequality between white men and white women and the impact of discrimination in 2004 and 2014, another important finding of our own.

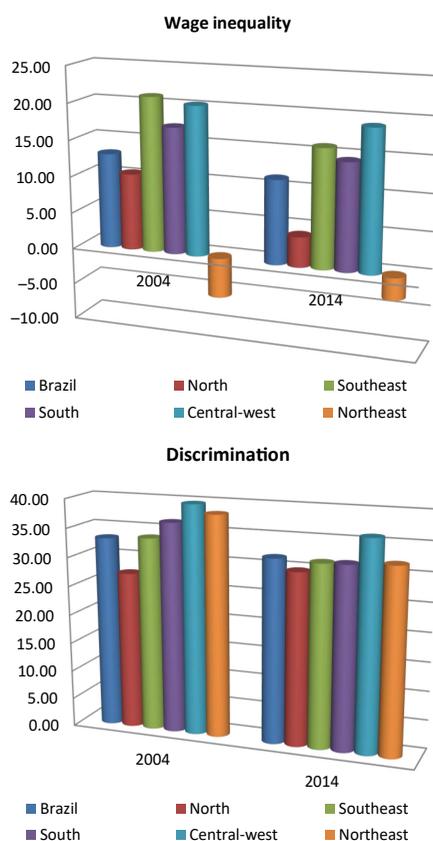
In Figure 2, there was a reduction in wage inequality and discrimination in the other regions. The largest drop in the impact of discrimination was observed in the northeast. In the southeast, proximity to the Brazilian average was observed in both years, as well as in the south and northeast, where discriminatory practices in 2014 were also close to the national level.

4.3.2 Decomposition of the wage differential between non-white men and non-white women. The results presented in Table 5 show an increase in the total wage differential between non-white men and non-white women, with a wage impact of 9.60% and 10.91% in 2004 and 2014, respectively.

In Table 5, the impact of the explained difference among non-white workers shows that the average women's salary would have decreased by 14.66% if they had the same characteristics as men. When comparing the results of the differences by gender between white and non-white workers, it can be observed that the wage difference is more evident among whites, a fact also observed by Souza and Gomes (2015).

Table 6 compares the wage differences between non-white men and non-white women for the Brazilian regions. It demonstrates that the wage difference by gender between non-white workers has grown in the south and central-west regions. Thus, to have wage equalization in the south, wages for non-white women would have needed to increase by 13.76% in 2004 and 19.75% in 2014.

Notably, in all regions, the share of the wage differential attributed to the factors explained in the salary determinations was negative, with the greatest impact in the northeast. This means that if non-white women in the northeast had the same characteristics as non-white men, their wages should have reduced by 23.60% in 2004 and 21.06% in 2014.



Source(s): Prepared by the authors, based on PNAD data for 2004 and 2014

Figure 2. Wage inequality and gender discrimination among white workers in Brazil and its regions, 2004 and 2014

Years Groups	Coefficient	2004		2014	
		Exponential coefficient	Coefficient	Exponential coefficient	Coefficient
Non-white men	1.85*	3.61*	1.85*	6.36*	
Non-white women	1.75*	3.29*	1.75*	5.74*	
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)	
Explained	-0.1760*	-16.14*	-0.1585*	-14.66*	
Discrimination	0.2677*	30.69*	0.2621*	29.96*	
Total difference	0.0916*	9.60*	0.1035*	10.91*	

Note(s): (*) significance at 1%
Source(s): Prepared by the authors, based on PNAD data for 2004 and 2014

Table 5. Decomposition of Oaxaca-Blinder for wage difference between non-white men and non-white women, Brazil, 2004 and 2014

North Years Groups	2004		2014	
	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
Non-white men	1.38*	3.99*	1.80*	6.05*
Non-white women	1.29*	3.66*	1.79*	5.99*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.1441*	-13.42*	-0.2052*	-18.55*
Discrimination	0.2293*	25.77*	0.2155*	24.05*
Total difference	0.0852*	8.89*	0.0103	1.03
Southeast Years Groups	2004		2014	
	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
Non-white men	1.52*	4.58*	2.05*	7.73*
Non-white women	1.35*	3.87*	1.88*	6.55*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.0207*	-2.05*	-0.0788*	-7.58*
Discrimination	0.1895*	20.86*	0.2447*	27.72*
Total difference	0.1688*	18.39*	0.1659*	18.04*
South Years Groups	2004		2014	
	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
Non-white men	1.44*	4.23*	2.03*	7.62*
Non-white women	1.31*	3.72*	1.85*	6.31*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	0.2197	24.57*	-0.0881*	-8.43*
Discrimination	-0.0907	-8.67	0.2683*	30.78*
Total difference	0.1290*	13.76*	0.1802*	19.75*
Central-West Years Groups	2004		2014	
	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
Non-white men	1.47*	4.34*	2.05*	7.79*
Non-white women	1.34*	3.83*	1.86*	6.44*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.1179*	-11.12*	-0.1051*	-9.98*
Discrimination	0.2426*	27.46*	0.2956*	34.39*
Total difference	0.1247*	13.29*	0.1905*	20.98*

Table 6.
Decomposition of
Oaxaca-Blinder for
wage difference
between non-white
men and non-white
women in the regions
of Brazil, 2004 and 2014

(continued)

Northeast Years Groups	2004		2014	
	Coefficient	Exponential coefficient	Coefficient	Exponential coefficient
Non-white men	1.46*	4.35*	2.05*	7.79*
Non-white women	1.34*	3.82*	1.86*	6.44*
Differences	Coefficient	Impact (%)	Coefficient	Impact (%)
Explained	-0.2692**	-23.60**	-0.2365**	-21.06**
Discrimination	0.3178*	37.41*	0.2860*	33.11*
Total difference	0.0486*	4.98*	0.0496*	5.08*

Note(s): (*) significance at 1%, (**) significance at 5%, (without asterisk) not significant

Source(s): Prepared by the authors, based on PNAD 2004 and 2014 data

Table 6.

Other evidences follow the richness of information in Table 6. The share of the wage differential attributed to the factors explained in the salary determinations has been found significant for all the Brazilian macro-regions. We have already commented the result for the northeast and for central-west. However, we also observed that if non-white women in the south had the same characteristics as non-white men, their wages should have been equalized by 13.76% (in 2004) and 19.75% (in 2014). For the southeast, Table 6 provides a similar insight – if non-white women in the southeast had the same characteristics as non-white men, their wages should have been equalized by a significant value of 18.39% (in 2004) and 18.03% (in 2014). Interestingly, in the north, this equalization would not be done through similar characteristics of non-white women with those of non-white men; actually, if the only difference was found in gender, the equalization in north would be of 8.89% (in 2004) and a non-significant value of 1.03% (in 2014).

We consider these results relevant for updating the literature on Brazilian traditional wage gaps. Following Table 6, we confirm there persist several mechanisms in each macro-region that contribute to the persistence of wage inequalities. We identified inequalities in gender and in color but we also recognize there persist mechanism of each macro-region contributing to this phenomenon. These mechanisms can be explained – in further studies – by differences in regional policies, political cycles of each state or even because the differences in the informal labor market characterizing the macro-regions (Leutwiler and Kleiner, 2003; Lapa, 2016) (see Figure 3).

Overall, the impact of discrimination was lower among the non-white population. This can be explained by the fact that the non-white population is predominantly employed in jobs that pay low wages, based on the minimum level, usually correlated with a lower wage range which follows Berik *et al.* (2004).

These results suggest that women in the labor market are suffering from statistically significant discrimination in addition to individual and societal prejudice. In the absence of discrimination, the wages of women across the country would have been higher. According to Teixeira (2008, p. 33), “*When efficiency is equal and the wage unequal, the only explanation is custom, founded on prejudice in the structure of society that makes women an appendage of man.*”

5. Concluding remarks, policy recommendations and further challenges

The analysis and understanding of the discriminations that persist in the Brazilian economy today is not a simple task. Although there are many factors that interfere with changes in the

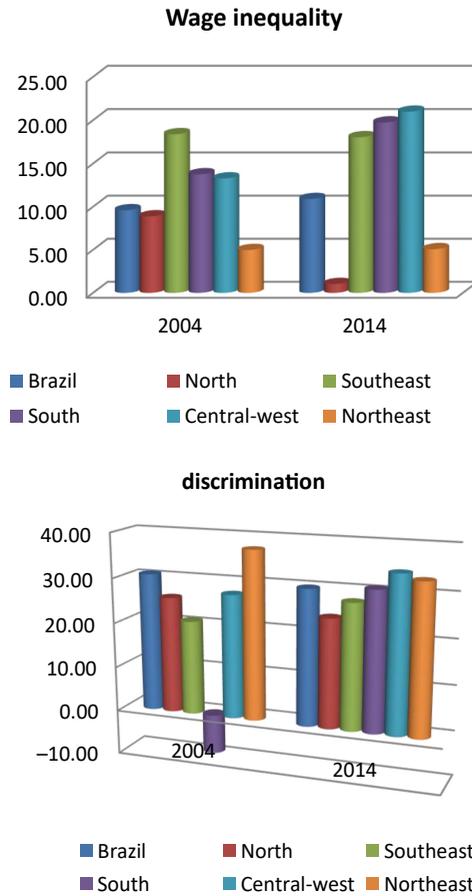


Figure 3. Wage inequality and gender discrimination among non-white workers in Brazil and regions, 2004 and 2014

Source(s): Prepared by the authors based on PNAD 2004 and 2014 data

world of work, such as socio-demographic changes, changes in the role of the state in a globalized world, new trends in the sexual division of labor and family arrangements, etc., the challenges imposed by gender and racial/ethnic discrimination are still a serious problem.

It was possible to confirm the hypothesis of discrimination in the labor market, since the unexplained wage differences were found to be positive and statistically significant. Likewise, through the Oaxaca-Blinder decomposition, it was possible to verify that wage gaps and gender wage discrimination are higher for white workers than non-white workers.

In the regional comparison, the central-west showed the highest degree of gender discrimination among the white employed population and the north region displayed the lowest degree. With regard to non-white workers, the salary difference was most significant in the southeast and central-west, and the impact of discrimination was highest in the northeast and central-west.

As implications from our results, we suggest several measures. Occupational segregation and the double working day for women have led many women to accept smaller wages in

exchange for a career that gives them more flexibility and social rights such as maternity leave. However, these benefits are seen by companies as costs, thus better wage bargaining by men is an aspect that deserves attention. Nevertheless, as gender discrimination is rooted in society, it is necessary to work with public policies of valorization, education, and awareness to overcome it (Faganello and Dasso Júnior, 2009). Therefore, it is essential to understand the notorious nature of gender discrimination at its multiple levels in other spheres of social, political, and cultural life (Goldani, 2000). In this context, public awareness policies, as mentioned above, in conjunction with schools have a key role in incorporating equality among genders.

The minimum wage rate, as well as all the policies that value lower wages, are also part of a policy that can contribute to reducing gender discrimination. When establishing a floor for minimum wage, since women make up the base of the social structure, they are among the workers with the lowest wages (Silveira, 2003; Lapa, 2016).

In addition to the existence of laws, greater enforcement is also required to ensure these anti-discrimination laws are followed. However, it is worth noting that in Brazil, the application of equal rights legislation and the fight against gender discrimination in the labor market are often not respected, not even by judiciary bodies (Pyl and Rocha, 2015).

In line with these results, it is possible to infer that the collective bargaining of wages with the participation of women, equality in maternity and paternity leave, better distribution of domestic tasks, as well as the creation of more daycare centers, among other measures, will become relevant actions to minimize gender wage differentials. Moreover, greater supervision is also required for compliance with the legal system against discrimination.

As a further challenge, we also consider relevant the possibility of updated regressions as soon as an updated database appears.

Notes

1. The authors acknowledge the suggestions provided by two anonymous reviewers. Remaining errors are authors' exclusive ones.
2. According to IPEA (2017), women reached the peak of labor market participation in Brazil in the last two decades, with 55% of women between the ages of 16 and 59 inserted in the labor market in 2015. In the same year, men had a participation rate of 78%.
3. This research examined the years 2004 and 2014, considering the behavior of the Brazilian economy in this period and the data available from the annual PNAD of IBGE, which were only made available until 2015. However, this last year of the PNAD was not considered in this research because of the strong economic crisis that the country went through, leading to non-significant econometric results.
4. Persons with a working age of less than 14 years were excluded from the sample.
5. The inactivity rate was calculated as the percentage ratio between the non-economically active population (NEAP) and the total number of people with 14 years or more of study. The unemployment rate was calculated as the percentage ratio between the unemployed population and the EAP.
6. Group of workers from the north with the lowest variation of the EAP (12.23%) in the analyzed decade (PNAD, 2004 and 2014).
7. Black and Brown skin were considered as non-white people.

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Corresponding author

Paulo Mourao can be contacted at: paulom@eeg.uminho.pt

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