Journal of Social and Political Sciences

de Lima, F. R. S. (2023). Analysis of Transition Odds and Inequalities in the Brazilian Labor Market Before and During Covid-19. *Journal of Social and Political Sciences*, 6(3), 87-93.

ISSN 2615-3718

DOI: 10.31014/aior.1991.06.03.428

The online version of this article can be found at:
https://www.asianinstituteofresearch.org/

Published by:
The Asian Institute of Research

The Asian Institute of Research *Social and Political Sciences* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of Social and Political Sciences, which include, but are not limited to, Anthropology, Government Studies, Political Sciences, Sociology, International Relations, Public Administration, History, Philosophy, Arts, Education, Linguistics, and Cultural Studies. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Journal of Social and Political Sciences* aims to facilitate scholarly work on recent theoretical and practical aspects of Social and Political Sciences.

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

The Asian Institute of Research
Journal of Social and Political Sciences
Vol.6, No.3, 2023: 87-93
ISSN 2615-3718

DOI: 10.31014/aior.1991.06.03.428

Analysis of Transition Odds and Inequalities in the Brazilian Labor Market Before and During Covid-19

Fabiano Roberto Santos de Lima[1]

[1] MSc Economics Candido Mendes University (UCAM); Professor at Estácio de Sá University (UNESA).
Email: fabianosdelima@gmail.com

Abstract
The aim of this work is to identify the chances of individuals moving to the state of unemployment in the Brazilian labor market with the application of a logit model, analyzing two moments: before the Covid-19 pandemic crisis and during the Covid-19 crisis. Evidence indicates that there was an increase in the probabilities of unemployment among pardos in relation to white and black groups. The chances of male groups being unemployed during and, therefore, after the crisis were lower than in previous periods. Black women had a more fragile situation in which they saw the threat of transition to unemployment increase by about 40% compared to the period before the health crisis

Keywords: Brazilian Labor Market, Labor Market Inequalities, Unemployment

1. Introduction

Brazilian society is experiencing some economic challenges and one of them is the high unemployment rate. The Covid-19 health crisis has contributed to the difficulties in the country, where conditions do not favor job creation. Data from the Brazilian Institute of Geography and Statistics (IBGE) indicate that in 2020, the number of people who did not look for work reached 15.3 million people.

Staying away from the labor market for long periods can reduce the individual's future opportunities to get a job and, consequently, discourage him from looking for an occupation. Thus, the odds of individuals remaining unemployed increase. Based on this, what is observed is the transition of the individual's state in the labor market in which he leaves the condition of being unemployed for inactivity (Darby, Haltiwanger and Plant, 1986; Nunes, Menezes-Filho and Komatsu, 2016). Therefore, the change in the unemployment rate is related to the decrease in job exit transitions and fluctuations in unemployment are driven by fluctuations in individuals entering jobs and it is these fluctuations in the odds of entering employment that drive both the level and the unemployment rate (Pissarides, 2008; Shimer, 2012; Corseuil, Franca and Ramos, 2020).

The economic literature is extensive in research that points to the existence of disparity between men and women in the unemployment and in this sense, it is worth investigating whether inequalities increased during the pandemic period and also, whether the chances of a transition to unemployment also varied, configuring a worsening of opportunities in the labor market. Obviously there is agreement in studies revealing that women are more likely to be unemployed than men, including during the pandemic period, this was also evidenced (Acevedo, Mora-Urda and Monteiro, 2019; Corseuil, Franca and Ramos, 2020; Gezici and Ozai, 2020; Costa, Barbosa and Hecksher, 2021). In Brazil, there are still negative effects on race. Blacks or pardos represent 64% of all individuals in the national territory, but unemployment among these individuals is almost double that observed for whites.

The aim of this work is to identify the chances of people moving to the state of unemployment in the Brazilian labor market with the application of a logit model, analyzing two moments: before the Covid-19 pandemic crisis and during the Covid-19 crisis.

In addition to this introduction, this short article describes in section 2 the data source and the applied econometric strategy; section 3 presents the empirical results and section 4 presents the conclusions of the study.

2. Data and Method

2.1. Source of Data Collection

Quarterly unemployment data provided by the Central Bank of Brazil and Brazilian Institute of Geography and Statistics (IBGE) were used in this study, divided as follows: *i*) unemployment of men and women; *ii*) total aggregate unemployment; *iii*) unemployment among white, black and pardo people. The analysis in the pre-covid period runs from 2016 to 2019 and, during the covid period, runs from March 2019 to December 2022, totaling 11 quarters of analysis in each period. Data were collected from the sources described in Table 1, below.

Table 1: Source data

Serie	Source	Period
men's unemployment	IBGE	quarterly
women's unemployment	IBGE	quarterly
aggregate unemployment	Central Bank of Brazil	quarterly
unemployment among white, black and pardo people	IBGE	quarterly

Source: The author

Apparently, the groups were equally impacted by unemployment over time, as shown in Figure 1 with the development of unemployment rates between men and women and between different races in Brazil, however, the chances of transition in the labor market fall more effectively about disadvantaged groups.

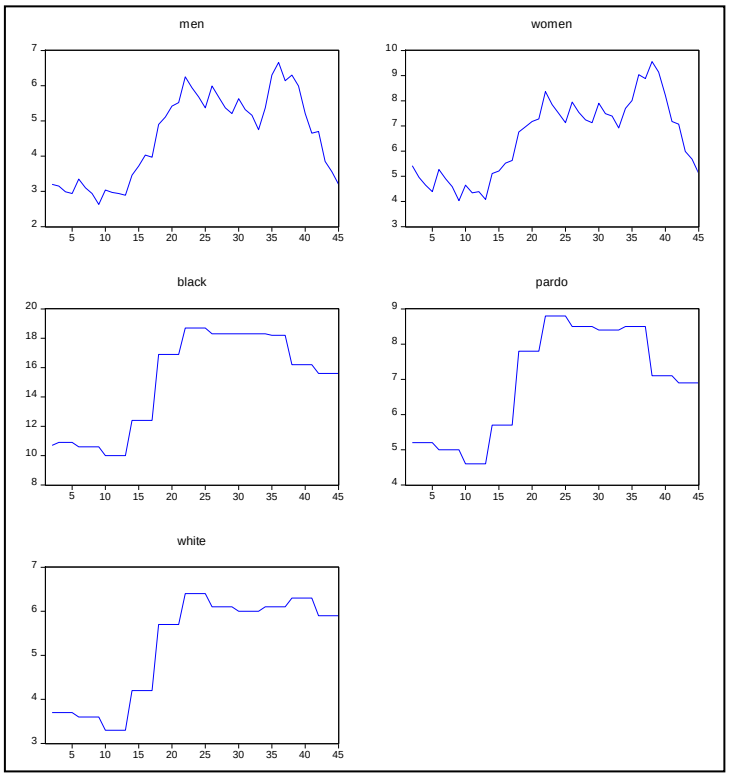

Figure 1: Unemployment rate among gender and race on the Brazilian labor market

Source: The author based on research data (2023)

As in Santos and Marques (2022), the variations between the unemployment rate of men and women in the time frame that goes from the first quarter of 2019 to the first quarter of 2021 as shown in Figure 2 below, it is possible to attest that unemployment among women is higher than that of men in approximately 37% on average. The second quarter of 2020, with social isolation already established in several Brazilian cities, revealed an increase in the unemployment rate of female groups compared to the first quarter of the following year by 23.5%, while unemployment among men increased by 10, 4% in the first quarter of 2020 to 12.2%, showing a variation of approximately 17%. The first quarter of 2019, compared to the first quarter of 2020, reveals that there were no significant fluctuations in unemployment between men and women. This shows that female unemployment was more impacted than male unemployment during the pandemic period.

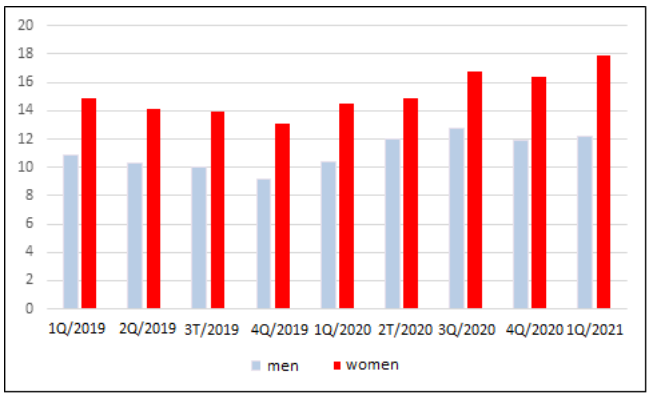

Figure 2: Variations between the unemployment rate from 2019 to 2021 for men and women.

Source: IBGE (2022)

2.2. Methodology

For the applied method, the hypothesis is assumed that an individual is employed or looking for a job in period *t* and depending on the possibilities of transition in period *t*+1, in which it is possible to obtain more than two possible alternatives for the variable of interest. The econometric strategy of applying a logit model with error correction by heteroscedasticity is used.

A model was specified that reveals the odds of an individual i moving to a state j of unemployment in the periods before the pandemic (from 2014 to 2019), during the pandemic (second quarter of 2020 to fourth quarter of 2021) and post-pandemic (first quarter of 2022 to fourth quarter of 2022). The model follows the specification adopted by Obben, Engelbrecht and Thompson (2002) where the existence of a theoretical continuous index Zi that varies from -n to +n determined by a set of explanatory variables that we can write as:

$$Zi = \beta_1 + \beta_2 X_{i2} + \cdots + \beta_k X_{i,k} \quad , i = 1 \ldots N \tag{1}$$

using matrix notation $Zi = X_i' B$ where:

$[B = \beta_1 \quad \beta_2 \quad \ldots \quad \beta_k\ ']$ and $[X_i' = 1 \quad X_{i2} \quad \ldots \quad X_{i,k}\ ]$ *Zi*'s observations are not available. Assuming that the available data only distinguishes whether individual observations are in a category, in this case the unemployed at period *t*. The logit model assumes that *Zi* is a logistic random variable. Therefore, the probability of an individual being unemployed given their attributes can be calculated from the cumulative logistic distribution function (CDF) evaluated in *Zi*:

$$Pi = f(Z_i) + \frac{1}{1 + e^{-Z_i}} \tag{2}$$

where *Pi* is the probability that individual *i* is unemployed, f is the cumulative logistic distribution function (CDF) evaluated at a specific value. *Zi* varies from -n to +n as *Pi* goes from 0 to 1, and when *Zi* = 0. Pi = 0.5.

Multiplying both sides of the equation by $\frac{1 + e^{-Z_i}}{Pi}$ results in:

$$e^{-Z_i} = \frac{Pi}{(1 - Pi)} \tag{3}$$

which is the odds ratio, the ratio between the probability of an individual being unemployed given the specific characteristics of sex and race. Taking the natural logarithm of both, we arrive at what is specified in Equation 4, below:

$$Zi = l_n \left[\frac{Pi}{(1 - Pi)}\right] = X_i' B = \beta_1 + \beta_2 X_{i2} + \cdots + \beta_k X_{i,k} \tag{4}$$

Therefore, the dependent variable in the logit model is the log of the odds that an individual is unemployed. The regression coefficients are estimated by the method of maximum likelihood. A given slope coefficient shows how the logarithm of the odds that an individual will be unemployed changes as the corresponding explanatory variable changes or when the attribute other than that of the base category is considered. As Obben, Engelbrecht and Thompson (2002) suggest, when the regression coefficients are exponentiated, the derived values indicate the effect of each explanatory variable directly on the individual's chances of being unemployed, rather than on the log probabilities. Subtracting from the antilogs and multiplying the results by 100 reveals the percentage changes in probabilities corresponding to a unit change in the explanatory variables.

3. Empirical Results

Table 2 presents the regression results with the variables that indicate the attributes used. Regressions were performed for men and women separately for each time period classified in this research.

Table 2: Results of regressions from unemployment in the years 2012-2019.

	Women			Men	
	Before the pandemic	During the pandemic		Before the pandemic	During the pandemic

	coefficients	coefficients		coefficients	coefficients
Total women	**0.8337*** **	**0.8771*** **	Total men	**0.1387*** **	**0.1999*** **
	(0.0150)	(0.0121)		(0.0096)	(0.0139)
	[0.9545]	[0.9964]		[0.9624]	[99,25]
Race			***Race***		
White	**1.0115*** **	**-1.2014**	White	**-0.2321*** **	**1.2744**
	(0.0742)	(0.9020)		(0.0483)	(0.8215)
	[0.0158]	[0.3929]		[0.1454]	[0.4861]
Black	**0.1113*** **	**2.8157*** **	Black	**-0.3017*** **	**-1.7540*** **
	(0.0666)	(0.6027)		(0.0477)	(0.4394)
	[0.2278]	[0.5634]		[0.1914]	[0.6515]
Pardo	**1.1325*** **	**1.5867*** **	Pardo	**-0.3210*** **	**-0.7599*** **
	(0.0616)	(0.2530)		(0.0123)	(0.2004)
	[0.3277]	[0.4753]		[0.9632]	[0.4988]

Source: The author based on PNADC/IBGE data (2023). Standard errors in parentheses.
*Note: *p<0,10; p<10%; **p<0,05; ***p<0,01.*

All regression coefficients were statistically significant in the period before the Covid-19 pandemic for all groups analyzed, with the exception of white women in the periods before and during the health crisis. During the pandemic period, the odds of unemployment among white women and men was not statistically significant. In the period immediately after the fourth quarter of 2021, the chances of white men and black women transitioning to unemployment were not statistically significant. Substituting the regression coefficients obtained in Equation 4 and using them in Equation 2, we arrive at the chance of individuals being unemployed in the analyzed period. The results follow in Table 2.

Table 3: Probabilities of Transition to Unemployment in the Labor Market.

	Before the pandemic	During the pandemic
	Prob	Prob
Total women	73,42%	74,62%
Race		
White	67,53%	69,05%
Black	49,99%	69,77%
Pardo	66,50%	70.77%
Total men	47,21%	45,16%
Race		
White	47,98%	44,41%
Black	45,96%	39,17%
Pardo	48,62%	45,08%

Source: The author based on PNADC/IBGE data (2023).

For men, the chances of migrating to the unemployment state after 2019 are much lower than until the year 2020. There is evidence that pardos are more likely to oscillate from one state to another in the labor market. During and after the pandemic, pardos were about 1.5% more likely to be unemployed than whites. During the pandemic period, the odds of pardos versus blacks transitioning to unemployment were practically equal.

No significant differences were found for the women in the 3 groups during the Covid-19 period. This reveals that the pandemic situation worsened the results for all groups. Among all groups of women, the chances of losing their job and migrating to the unemployment state became greater in the pandemic period than previously observed. White women were 1.5% more likely to be unemployed than brown women. During the pandemic, the situation is reversed and brown women now have 2% more chances of unemployment than white women. When compared to black women, the values are practically the same. This can be justified by the fact that in many studies in Brazil, the total number of pardo people are incorporated into black people. Also, most functions performed by women are allocated in the service area and, in terms of unemployment, black women were the most affected over time, as Santos and Marques (2022) reveal. With fewer black women losing their jobs, it can be inferred that the number of white women losing their jobs in the labor market has been increasing. During the health crisis, the chances of transition were the same for all groups of women and the same can be said about the post Covid-19 period.

The increase in the probabilities of unemployment between periods in the group of black women is noteworthy. During the pandemic, compared to the previous period, employed or inactive black women increased the chance of becoming unemployed by approximately 40%. In general terms, comparing the situation of men and women, there was a significant difference in the chances of unemployment between the groups, where black women were 78% more likely to be unemployed than black men from 2020 to the present. Since the pandemic, women in general are 65% more likely to be unemployed than men.

4. Conclusions

The Brazilian economy suffers from conjunctural and structural problems that make it difficult to resume full employment. In addition to the difficulties, there is the problem of inequalities in the labor market. This study sought to contribute to the literature by segmenting in more detail the groups in which, normally, only whites and non-whites are differentiated. In addition, it reveals the chances of unemployment of the groups before and during Covid-19. There is no intention of exhausting the discussion with this material, since the literature already shows, for example, the impact of education on unemployment and as a suggestion for future studies, one can seek to answer questions about how the degree of study impacted in unemployment levels during the pandemic. There was an increase in the probabilities of unemployment for pardos in relation to white and black groups, and it was also evident that the chances of male groups being unemployed during and, therefore, after the crisis was lower than in previous periods. On the other hand, black women had a more fragile situation in which they saw the threat of transition to unemployment increase by approximately 40% compared to the period prior to the health crisis. Such results are consistent with the economic literature, which generally reveals that women are more affected by existing inequalities in the labor market.

Acknowledgment

This research is supported by a research grant from the Productivity Research Program at Estacio de Sá University.

References

Acevedo, P.; Mora-Urda, A. I. & Montero, P. (2019). Social inequalities in health: duration of unemployment unevenly effects on the health of men and women. *European Journal of Public Health*. pp.1-6. https://doi.org/10.1093/eurpub/ckz180

Corseuil, C. H.; Franca, M. & Ramos, (2021). The recent drop in occupancy rates and participation in the labor market and its dynamics. *Carta de Conjuntura*. IPEA, 48.

Costa, J. S.; Barbosa, A. L. N. H. & Hecksher, M. (2021). *Inequalities in the labor market and the Covid-19 pandemic*. Discussion texts. IPEA.

Darby, M. R.; Haltiwanger, J. C.& Plant, M. W. (1986) *The Ins and Outs of Unemployment: The Ins Win. National Bureau of Economic Research*. Working Paper. https://doi.org/10.3386/w1997

Elsby, M. W. L.; Michaels, R. & Solon, G. (2009). The Ins and Outs of Cyclical Unemployment. *American Economic Journal: Macroeconomics*. *1*(1), p. 84-110. https://doi.org/10.1257/mac.1.1.84

Gezici, A. & Ozay, O. (2020). How Race and Gender Shape COVID-19 Unemployment Probability. Political Economy Research Institute. 521, pp.1-19. https://doi.org/10.7275/28042951

Hecksher, M. (2020). Imprecise value per exact month: microdata and indicators based on the Continuous PNAD. Technical Note. 62. IPEA.

Nunes, D., Menezes-Filho, N. & Komatsu, B. (2016). Probabilities of admission and termination in the Brazilian labor market. Estudos. Econômicos. 46(2), pp. 311-341. http://dx.doi.org/10.1590/0101-416146222dnb

Obben, J.; Engelbrecht, H. & Thompson, V. (2002). A logit model of the incidence of long-term unemployment, Applied Economics Letters, 9(1), pp. 43-46. https://doi.org/10.1080/13504850110046840

Petrolongo, B. & Pissarides, C. A. (2008). The ins and outs of European unemployment. American Economic Review: Papers and Proceedings. *98*(2), pp. 256- 262.

Santos, F. R. & Marques, J. (2022). Effects of the COVID-19 pandemic on the Brazilian labor market: increasing inequalities. Brazilian Journal of Development. 8(11). pp.76682–76698. https://doi.org/10.34117/bjdv8n11-398

Shimer, R. (2012). Reassessing the ins and outs of unemployment. Review of Economic Dinamics. 15 (2), pp.127-148. https://doi.org/10.1016/j.red.2012.02.001