THE GENDER GAP AND COVID-19 PANDEMIC: AN ANALYSIS FOR NET BRAZILIAN FORMAL JOBS DESTRUCTION

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Abstract

This paper aims to analyze the gender gap behavior in the Brazilian labor market due to the economic effects of the COVID-19 pandemic, focusing on the destruction or creation of jobs during the lockdown and social distancing implementations, covering the behavior all months of 2020. For this, we use the New General Register of Employed and Unemployed (NCAGED) and apply the Oaxaca-Blinder decomposition between the female and male net destruction jobs at municipal levels, considering individuals with 18 to 40 years. We verify the inequality for every month of 2020, pre-and post-lockdown in pandemic context. We found evidence that the initial months were harmful to all formal workers but had even greater weight on women. Furthermore, another relevant contribution is in the inequality decomposition, where the findings show that it is largely due to structural effects.

Keywords: Gender Gap; Job Destruction; COVID-19 pandemic; Inequality decomposition

Resumo

Este artigo teve como objetivo analisar o comportamento da desigualdade gênero no mercado de trabalho brasileiro, frente aos efeitos econômicos da pandemia COVID-19, com foco na destruição ou geração de empregos durante as implementações de bloqueio e distanciamento social, abrangendo o comportamento em todos os meses de 2020. Para tanto, utilizou-se o Novo Cadastro Geral de Empregados e Desempregados (NCAGED) e aplicou-se a decomposição Oaxaca-Blinder sobre a diferença entre as taxas de destruição de vagas líquidas de homens e mulheres, em âmbito municipal, considerando indivíduos com 18 a 40 anos. Verificou-se a desigualdade para todos os meses de 2020, pré e pós-*lockdown*, sendo que os meses iniciais da pandemia foram prejudiciais para todos os trabalhadores formais, mas tiveram um peso ainda maior sobre as mulheres. Além disso, outra contribuição relevante da análise está na decomposição da desigualdade, onde os resultados mostram que ela se deve em grande parte a efeitos estruturais.

Palavras-chave: Diferença de gênero; Destruição de empregos; Pandemia do Covid19; Decomposição de desigualdade

JEL: J16; J23; J63

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1. INTRODUCTION

Since Doeringer and Piore (1971) treated the discrimination in the workforce as a cultural factor that remains between generations, several articles seek to explicate the gender gap and their persistence throughout different countries (see as example Adda et al., 2017; Künn-Nelen, De Grip, Fouarge, 2013; Goldin, 2014; Le Barbanchon et al., 2021). This present research contributes to this discussion, to examine the gender behavior in the Brazilian labor market as a response to the economic effects of the COVID-19 pandemic. Specifically, the analysis is on job creation or destruction during the lockdown and social distancing implementations, covering the behavior all 2020s' months.

The discrimination in the workforce may be internal or external, depending on where the worker is (Vietorisz and Harrison, 1973). If he or she is employed, internal discrimination may be with private employer cost with training and risks involved (human capital factor – see Manning and Swaffield, 2008). On the other hand, where the worker is out of the formal workforce, the discrimination may come from the historical and evolution of the system (Reich, Gordon and Edwards, 1973). This discussion is old but very current, mainly because the COVID-19 pandemic (C19p) may force employers to make difficult decisions about their employees, which may involve vacancy destruction considering the gender.

In truth, because this discussion is old, the decision about employer risk-taking also maybe before done C19p but may reveal meaningful gender discrimination in the Brazilian labor market during the pandemic shock. According to Adams-Prassl et al. (2020), the United Kingdom (UK) and the United States (US) women workers are more likely to lose their job, around 4.8 percentage points (pp) and 6.5 pp, respectively, than men. However, these losses are independent of job characteristics and show that other factors, as "traditional" (or domestic) women's activities, may play some gender gaps.

The gender gap after C19p also stands out in the South Korean labor market. According to Ham (2021), women are experiencing more unemployment or leave of absence than men, being the married women with more percentages than unmarried, while married men workers experienced fewer of these outcomes. In addition, again, the women's care duties are the principal explanations for these gender differences.

Reichelt et al. (2021) analyze the households' gender role after C19p transitioning to working from home or transition to unemployment. Their findings indicate that men's unemployment or men's home office activities increase their time with domestic activities, turning more egalitarian the labor division. However, when the paper is inverted, and the women lose their job or transition to home office activity, something pushes her to almost total domestic activities.

To Goldin (2014), the domestic activities between women and men may balance if firms do not have incentives to reward individuals with more available hours. There is evidence in various sectors with productivity gain to adopt the part-time work. For example, take the Dutch pharmacy sector, where the part-time enables the firms to remain open in lunch breaks or 24 hours without paying overtime, despite paying night wages (Künn-Nelen, De Grip and Fouarge, 2013).

However, if part-time work is not for everyone, the likelihood of gender discrimination increases as women's participation in this format increases (Haines, Doray-Demers, and Martin, 2018). Furthermore, there are shreds of evidence of wage penalty among part-time women workers in Organization for Economic Co-operation and Development (OECD) countries, except to Sweden (Bardasi and Gornick, 2008).

The recent Brazilian gender discussion has positive findings towards the insertion of women in the formal labor market (Bruschini and Lombardi, 2000; Bruschini, 2007), the wage gender gap reduction (Scorzafave and Pazello, 2007; Freitas, 2015; Haussmann and Golgher, 2016), the turnover analysis (da Silva Filho, 2018), and gender vulnerability after C19p (Pizzinga, 2021).

Bruschini and Lombardi (2000) highlight the women's insertion in the Brazilian labor market, considering good (that requires superior knowledge) and bad (competitive) works. Their findings indicate that the women's insertions in good works are relatively equal to men's rate. On the other hand, the competitive works, mainly represented by domestics, were characterized by the increases in the average age and salary, however, with the stigma of being genuine female jobs, and therefore without meaningful comparison with the men participations. These positive trends of Brazilian women's insertion start in the

mid-seventies. In this sense, Bruschini (2007) highlights the challenges, progress, and current issues of female participation in the Brazilian labor market. Their findings indicate perpetuating family care notions, which implies an extra burden on women who prioritize careers.

Several recent articles seek to measure these women's additional charges from the wage gap. According to Scorzafave and Pazello (2007), the wage gap has decreased, being 0.48 in 1988, 0.28 in 1996, and 0.22 in 2004. Furthermore, to Haussmann and Golgher (2016), in 2012, the Brazilian gender gap vanishes in some sectors, being favorable for women in the education sector. However, the C19p, and the circulation restriction in mid-march, 2020 may have changed this increased progress. According to Pizzinga (2021), the female in competitive Brazilian labor is vulnerable to circulation restrictions. This finding aligns with the international literature where the C19p has promoted gender transactions in market labor and increasing gender discrimination (see, e.g., Ham, 2021; Reichelt, Makovi, and Sargsyan, 2021).

Concerning the increase in gender discrimination, before considering the gap in gender wage, this research concerns the workers' survival issue. We understand that, in a crisis, the first step in order not to lose progress is to maintain a job. Thus, this article contributes shreds of evidence for the Brazilian labor market, exploring the creation and destruction of jobs by gender during C19p. The article's strategy utilizes the Oaxaca-Blinder decomposition between male and female creation or destruction jobs.

The New General Register of Employed and Unemployed (Novo Cadastro Geral de Empregados e Desempregados – or Novo CAGED as the acronym in Portuguese) is available by the Brazilian Labor Bureau (or *Secretaria Especial de Previdência e Trabalho* as is known in Brazil). This database shows the monthly unemployment and employment individual by gender, sector, age, scholarly, and municipality. However, this research computation considers the municipality's rates by gender and sector for individuals between 18 to 40 years. According to Bhat *et al.* (2007), this age interval is the most likely childbearing. Also, this interval seeks to reduce the possible noise in the destruction of jobs by age (Ejarque, 2020).

We linked the results with the policies implemented to maintain jobs and found that even with such policies in the initial months of circulation restrictions, the country registered job destructions. At this moment, decomposing this effect by gender, employers gave more preferences to the maintenance of men than women jobs. Although there is no empirical test, our findings may be associated with the employer's cost of training with the worker in the past (Human Capital effect), women are less likely to change jobs (no Job-Shopping effect), and women cultural factors, where women subjugate themselves inferior to men (Psychological effects)[3].

The framework of this paper has four steps beyond this introduction: the second section brings the Brazilian work context before C19p and a relative panorama during the months of 2020; the third section presents the methodology; the fourth sections describe the results; and, finally, the fifth section concludes.

2. CONTEXT

Throughout the months of 2020, the Brazilian workers through for a sequence of events, where the year begins relatively at the same as other years, but with a break in March when the World Health Organization (WHO) declares international emergence with COVID-19 pandemic (C19p) and indicates four essential steps for governments: [i] be ready; [ii] detect and treat; [iii] reduce transmission; [iv] learn and innovate (WHO, 2020).

The point that most affects the labor market is the lockdown measures that seek to reduce the transmission in the short term, but that remains longer than desire. According to the Brazilian Federal Court of Justice (STF as it is the acronym in Brazil, 2020), the social distance rules responsibilities are for state and municipal governments. In this sense, mapping each municipal role gets hard. However, according to the Global Mobility Report from Google Maps, available from February 2020 from current days (June 2021), the workplaces percentage average changes in April 2020 drops around 30% about the normal movement of previous years, being 76% in the Distrito Federal, the state with most considerable social distance (Figure 1).

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[3] For an in-depth analysis of each of these points, see Manning and Swaffield (2008).

Figure 1. Average Percentage Change for the Brazilian States and Brazilian Polynomial Smooth (February-2020 – May 2021)
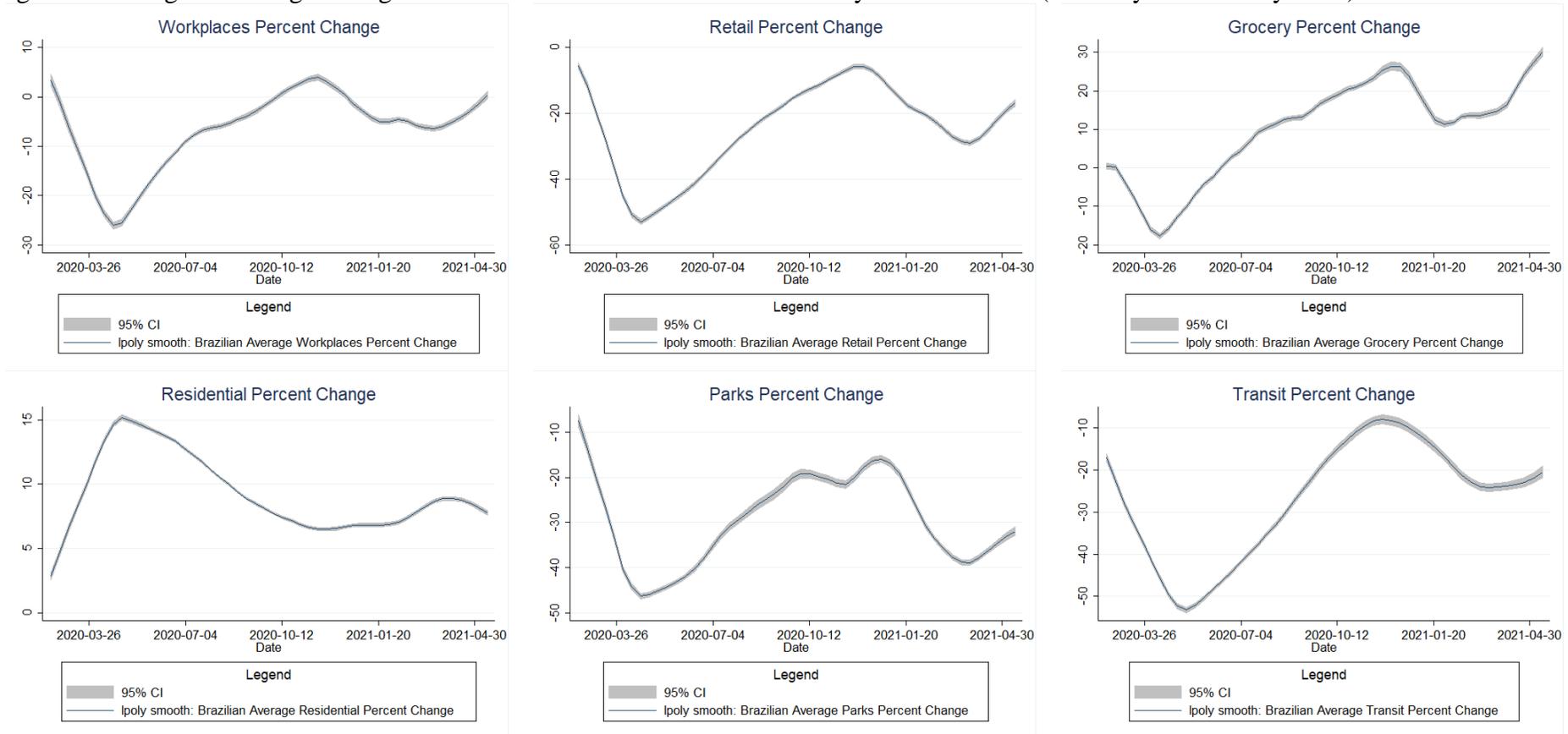
Source: Own Construction based on data from the Global Mobility Report of Google.

The Brazilian average workplace change time returns to the usual percentage (0%) at the beginning of 2021, but the other places percentage change after the C19p remains out of 0% until nowadays. It stands out the residential time, where the people, on average, remaining around 7% more of daily time indoors. Beyond residential and workplaces, the changes also are meaningful in parks, grocery, retail, and transit.

In this context, the federal government adopts some labor market support measures against C19p effects. For example, on March 22, the Provisional Measure 927 (MPV 927, 2020) indicates that employers and employees may celebrate a written agreement to maintain employment and income under public calamity rules (Brasil, 2020b). The MPV 927 also deals with vacation conditions, bank hours, telecommuting, qualification, and postponement of labor obligations of March, April, and May to July 2020, with an interest-free installment option.

With the increase in social distance, the federal government then promulgates, on April 1, a new Provisional Measure 936 (MPV 936, 2020), which provides for a 25%, 50%, and 70% reduction in working hours and wages, with specific rules according to the salary in the portfolio and suspension of the employment contract (Brasil, 2020c). In these cases, the replacement of the worker's income is carried out by the government, according to pre-established limits. However, the agreement does not deal with dismissals for cause or voluntary dismissals.

On April 3, 2020, the Provisional Measure 944 (MPV 944, 2020) sought to protect companies' jobs that received between R$360 thousand and R$10 million in the 2019 fiscal year (Brasil, 2020d). This MPV creates the Emergency Jobs Support Program (PESE or *Programa Emergencial de Suporte a Emregos* in Portuguese). The credit lines are exclusive to rescue the payroll expenses, and the companies cannot promote job destruction up to 60 days of the last installment received in this program.

Finally, on May 18, 2020, the Law 13,999 (Act 13,999, 2020) instituted the National Support Program for Micro and Small Businesses (PRONAMP or *Programa Nacional de Apoio às Microempresas e Empresas de Pequeno Porte* in portuguese). In this program, the credit lines are according with 30% of 2019 micro-firms revenue or 50% if the firm started in 2019 (Brasil, 2020a). Also, the Act does not limit the credit lines at payroll payment and seeks to relieve the increase of market frictions of micro-firms.

These were the main measures in the formal labor market, except the public sector, which sought to buffer the C19p effects throughout 2020. However, we do not seek to evaluate these measurement's effects in this paper. Instead, in the following sections, our propositions have explored the destruction or creation of jobs according to this context.

3. METHODOLOGY

The research design contains two steps. First, it presents the data characteristics, the variable constructions, and their descriptive statistics. In this point, we present a brief defense of used variables and their objectives. Then, we present the empirical strategy used to arrive at the results.

3.1. Database and variables
The NCAGED

We use the New General Register of Employed and Unemployed (*Novo Cadastro Geral de Empregados e Desempregados* – or NCAGED as the acronym in Portuguese) to evaluate the jobs destruction or constructions. This data comes from the Brazilian Labor Bureau (BLB or *Secretaria Especial de Previdência e Trabalho* as it is known in Brazil) and has monthly periodicity, registering only the current movement. The total labor stock is present in another base of BLB that is known as Annual Relation of Social Informations (RAIS or *Relação Annual de Informações Sociais* in Portuguese) and has the last day of December as the base.

This research will use only the movement base (NCAGED) because we seek to identify job creation or destructions for each month of 2020. According to Brasil (1965), employers should declare their movements of jobs monthly. From 2019, the declarations are through the Digital Bookkeeping System for Tax, Social Security, and Labor Obligations (Brasil, 2019). Thus, the database may have errors and omissions because the base comes from employers' statements. However, according to the BLB, currently,

these bases covered, on average, 97% of total formal Brazilian labor jobs. Also, the NCAGED is the official base used for policy creations presented in the Context section.

Concerning errors, some distortions occur in filling in the age and the declarations of race. For Osorio (2003), some workers declare themselves white when applying for a job, even though they do not belong to that race, and this position remains when the employers effectively hire. In this sense, Paixão, Rosseto, and Monçores, (2012), comparing RAIS with the PNAD (National Household Sample Survey or *Pesquisa Nacional por Amostra de Domicílios* in Portuguese), do not reject the null hypothesis that the race effect exists. However, there is a convergence in the distributions of these both bases.

So, since CAGED is the monthly movement that makes up the annual Brazilian total stock of jobs, their distribution seems to be the most adequate to this research objectives.

Job Creation and Destruction

In this research, the job movement disregards the dismissals due to death, retirement, or ignored type. In addition, it disregards dismissals and admissions by transfer and public sector movements—all other movements presented in the NCAGED enter this research.

The following equations indicate the process used to measure the job creation or destruction variable. Orellano and Pazello (2006) measure the creation and destruction of jobs from the equation (1) and (2), respectively:

$$JC_{g,m,t} = \frac{AD_{g,m,t}}{\frac{L_{g,m,t}+ L_{g,m,t+1}}{2}} \tag{1}$$

$$JD_{g,m,t} = \frac{DE_{g,m,t}}{\frac{L_{g,m,t}+ L_{g,m,t+1}}{2}} \tag{2}$$

where AD is admissions, and DE is dismissals occurred in month *t*, for gender *g*, and municipality *m*. L is the total stock at the beginning of the period. The denominator is the average between the beginning and end of the period.

From these measures, the literature uses the net creation or destruction of jobs from subtraction between $JC_{g,m,t}$ and $JD_{g,m,t}$, being creation if the results are positive and destruction if the results are negative (Orellano and Pazello, 2006; da Silva Filho *et al.*, 2014; da Silva Filho, 2016). However, in the present research, we will use the multiplicative approach, calculating the gender ratio between $JD_{g,m,t}$ and $JC_{g,m,t}$ as following equation:

$$Y_{g,m,t} = \frac{JD_{g,m,t}}{JC_{g,m,t}} \tag{3}$$

The multiplicative approach brings some advantages. First, we do not need to compute the total stock from RAIS because the division considers unnecessary the total stocks. Thus, it is possible to do a direct relative analysis between the genders. Also, the analysis becomes in around one unity. If the results were greater than one ($Y_{g,m,t} > 1$), then we have jobs destruction, and if the results were less than one ($Y_{g,m,t} < 1$), then we have job creation. Considering Equation (3), Table 1 shows the municipals statistics for the January-December 2020 period.

Table 1. Municipal descriptive statistics, by type of movement and sex, 2020

Type of movement	Female			
	Mean	Std. Dev.	Min	Max
Dimissals	92.19	992.98	0	81578
Admissions	94.79	1005.56	1	72972
Dismissals/Admissions	1.31	3.10	0	339
Type of movement	Male			
	Mean	Std. Dev.	Min	Max
Dimissals	122.55	1249.90	0	103821
Admissions	131.40	1326.29	1	96757
Dismissals/Admissions	1.41	6.75	0	1030

Source: Own Construction based on NCAGED data.

In Table 1, we can see that the ratio $Y_{g,m,t}$ is greater than one, indicating that, on average, 2020 had more destruction than the creation of jobs. However, these values do not remain symmetric between Brazilian municipalities, as the average municipal dismissals and admission present the most significant standard errors for both genders.

In the gender points, this research considers only individuals aged between 18 and 40 years (presents statistics in Table1). Besides being the age range with the highest probability of procreation (Bhat *et al.*, 2007), Ejarque (2020) indicates that seniors have different behavior on job destruction. Thus, this age filter seeks to eliminate the destruction or creation of jobs for seniors, reducing the noise of the unexplained part of the decomposition that we will present in the decomposition analysis.

Thus, between January-December 2020, there were total dismissals of 4,432,312 for women and 6,740,573 for men. Also, in the same period, there were admissions of 4,532,313 for women and 7,191,831 for men. Table 2 presents statistics for variables related to observable characteristics that contribute to productivity and sector for these individuals.

Table 2. Descriptive statistics of the characteristics of individuals and composition of sectors, 2020

Variables	Male		Female	
	Mean	Std. Dev	Mean	Std. Dev
Education Level				
Full Elementary School	0.09	0.28	0.04	0.21
Full High School	0.62	0.49	0.65	0.48
Full University Education	0.06	0.24	0.14	0.34
Age	28.09	6.40	27.78	6.41
Sector				
Industry	0.19	0.39	0.13	0.33
Construction	0.14	0.35	0.02	0.13
Commerce	0.23	0.42	0.29	0.45
Services	0.24	0.43	0.34	0.47
Science and technology	0.03	0.17	0.04	0.19
Education	0.01	0.11	0.04	0.20
Health	0.02	0.14	0.09	0.29

Source: Own Construction based on NCAGED data.

In Table 2, it is possible to see how much men and women differ in terms of attributes that they can contribute to productivity at work and the sector of activity. Therefore, the research design considers aggregating these characteristics by the municipality, sex, and monthly averages in the decomposition estimations. This strategy is present in the following subsection.

3.2. Counterfactual Decomposition

The differences between groups, related to labor market results, can be due to observed factors linked to productivity, such as experience and educational stock. However, according to Blinder (1973), even if these groups have similar productive characteristics, one may be more impaired than the other due to discrimination and other factors that hinder the chances of permanence and hiring and occupations with higher wage gains.

The Oaxaca-Blinder procedure usually separates such components from inequality (composition effect and structural effect), besides verifying each explanatory variable's contribution in this decomposition. This type of analysis is common for wage income (Scorzafave and Pazello, 2007; Etilé and Plessz, 2018; Firpo, Fortin, and Lemieux, 2018; Schwaab *et al.*, 2019), but can also is usual for movement in the labor market, as in Ham (2021).

The strategy base comes from a linear estimation Equation (3). However, as we intend to verify the inequality for each period t, we have:

$$Y_{g,m,t} = X_{g,m,t}\beta_{g,t} + \varepsilon_{g,m,t} \text{ for } g\text{=}H,\ L, \text{ and } t\text{=}1,...,12, \tag{4}$$

where $Y_{g,m,t}$ is the result for group g; X_g is a vector of observed characteristics of individuals belonging to group g; and β_g is a vector with the respective coefficients.

Because it is an aggregate result for each municipality m, as seen in Equation (3), the decomposition process considers municipal averages of all variables. We assume that the group with the subscript H had favorable results, and the other group, represented by L, has unfavorable results. Therefore, considering the previous literature (presented in Introduction sections), this research assumes that H is men and women are in group L.

The strategies predict to estimate Equation (4) by Ordinary Least Squares method. According to Angrist and Pischke (2008), the coefficients found are the same for conditional and unconditional estimation because of the Law of Iterated Expectations. Thus, flowing Blinder (1973), the unconditional decomposition comes from:

$$\bar{Y}_H - \bar{Y}_L = (\bar{X}_H - \bar{X}_L)\beta_H + (\beta_H - \beta_L)\bar{X}_L, \tag{5}$$

Unlike wages analysis, we can expect the gap between job destruction to be negative for group H. The term $(\bar{X}_H - \bar{X}_F)\beta_H$ represents the compositional effects, which explain the difference related to the observable productive characteristics of each group. The term $(\beta_H - \beta_L)\bar{X}_L$ explains the difference due to unobservable factors (structural effect), such as the differences resulting from discrimination against the female sex, the penalty of motherhood, and the fall in productivity due to the dedication to traditional (domestic tasks) activities (England *et al.*, 2016; Cooke and Hook, 2018; Firpo, Fortin, and Lemieux, 2018; Ham, 2021).

In addition to decomposing the changes or differences in the results, this procedure allows dividing each component in the contribution of each variable, which is simple to verify when it comes to decomposition in the mean (Firpo, Fortin, and Lemieux, 2018).

4. RESULTS

The behavior of the net movement jobs market, by gender, through 2020 is present in Figure 2. The analysis indicates that the pandemic's beginning was harmful to both genders, where there is a net destruction of 4 vacancies for women and 3 for men. Comparing Figure 2 with Figure 1 (mobility at places) is possible to associate the social distances with job destructions. The findings indicate a worse scenario for women, comparing with the men scenario, until July. Then, only between August and November is there a balance between net job creations.

Before analyzing what influenced this difference in results, we compared the level of Education and participation in each sector to draw a brief profile on some characteristics observed for men and women who went through some movement in the Brazilian labor market in 2020. Table 3 shows the composition of each group according to the type of movement.

Figure 2. Net vacancy destruction rate, by gender, January to December 2020
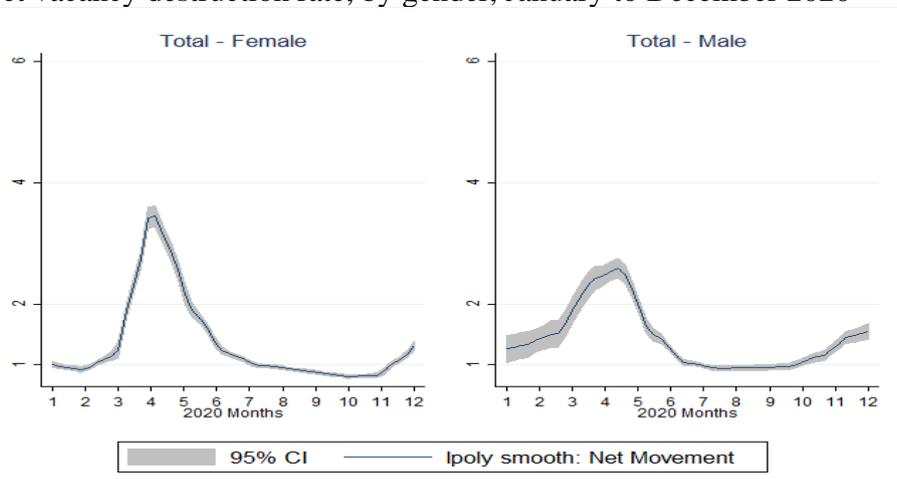
Source: Research Results

Most women and men, regardless of the type of movement, have until high school. Regarding university education, 14% of women completed this stage, compared to 6% of men. Of the total number of women admitted in the period, 33.5% are in the Service sector, while1.8% were in the construction sector.

About the total admissions of men in the period, the largest share also is in the service sector (23.5%). However, there is more negligible participation of men in the Education sector (1.2%).

Table 3. Allocation of workers by sex, Education, and sector, 2020

	Admissions		Layoffs	
Education level	Female	Male	Female	Male
Full Elementary School	4.3%	8.5%	4.7%	9.0%
Full High School	65.0%	62.8%	64.2%	60.9%
Full University Education	14.1%	6.3%	13.4%	6.3%
Sector				
Industry	12.9%	19.1%	12.3%	18.5%
Construction	1.8%	14.2%	1.6%	13.6%
Commerce	28.6%	22.2%	29.9%	22.8%
Services	33.5%	23.5%	34.6%	24.3%
Science and Technology	3.9%	3.1%	3.7%	2.9%
Education	3.9%	1.2%	4.4%	1.4%
Health	10.0%	2.0%	8.1%	1.7%

Source: Research Results

In the Health sector, considered the front line of C19p, the period shows an admission of 10% for women, against only 2% for men. For layoffs, the composition by gender, according to schooling and sector, is similar to that of admissions.

Figures 3 and 4 show the gender shares and their net movement in each category. The results predict that 60% of the total number of individuals with the complete university were women, while for the total with complete elementary school, the proportion of women is only one quarter.

Figure 3. Share by gender, type of movement, and level of education, 2020.
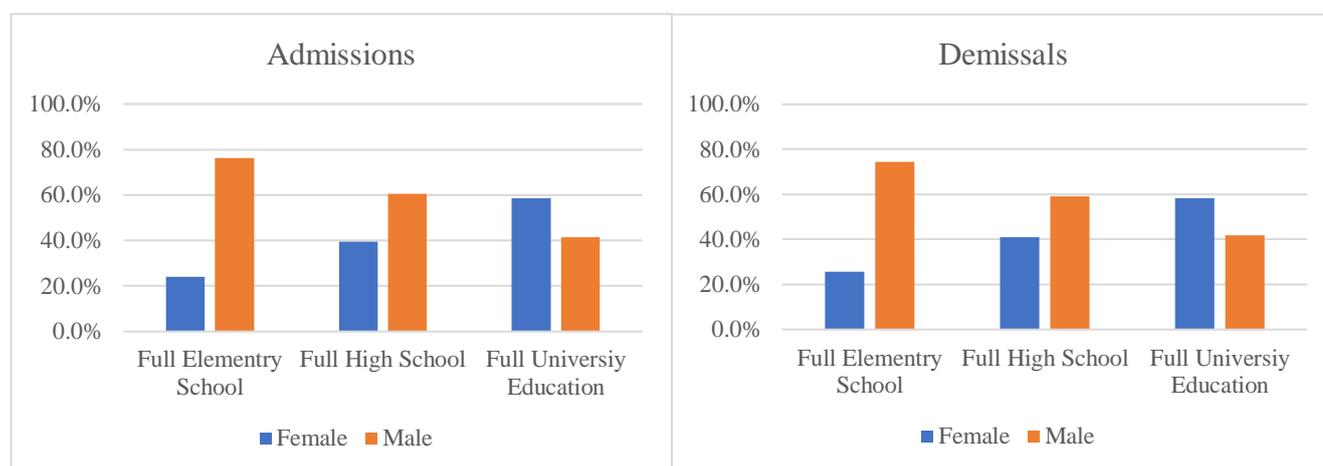
Source: Research Results

As for the sectors, female movement share is lower in Industry and Construction, while in the intensive face-to-face sectors, the net women movement shares split between Commerce and Services sectors. For example, in Education, 66% of the workers admitted in the period were women, but their layoffs are around 68%.

We highlight the predominance of hiring women in the health sector (75%), being the 4th in which there is more allocation of female labor, as seen in Table 3. However, of the total number of layoffs in the sector, there is also a predominance of women, promoting a relative movement balance.

Figure 4. Participation by gender in each sector, 2020
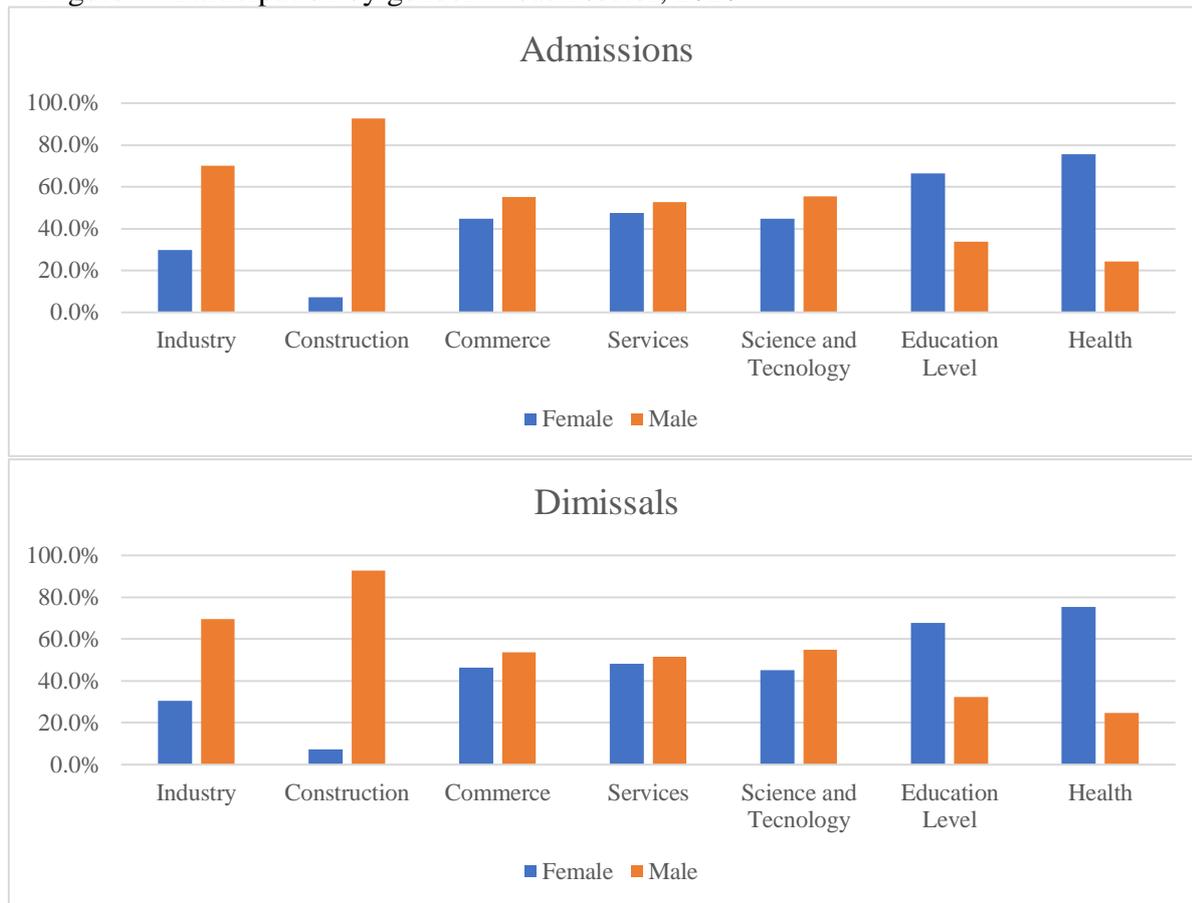
Source: Research Results

To draw a descriptive comparison of the average job destruction rates, Table 4 shows their averages, by sector analyzed, for the total of 2020 and selected months. In addition, the results by gender and sector are present in Figure 5. For example, table 4 shows that Industry was the most affected sector at the C19p beginning. However, men of this sector have gone through job destruction since the beginning of the year (before C19p).

Table 4. Net vacancy destruction rate, by sector, 2020

| Sector	Total	January	April	December
Industry	1.84	1.30	5.44	1.94
Construction	1.29	1.00	2.76	2.05
Commerce	1.15	1.13	2.67	1.04
Services	1.25	0.91	4.01	1.08
Science and Technology	0.97	0.78	1.99	1.21
Education	1.55	1.06	3.75	3.63
Health	0.83	0.79	1.30	0.95

Source: Research Results

Figure 5 presents a peak in April for all sectors, as seen for the total net job destruction rate (Figure 4). The exception is for men in the Heath sector, which had more admissions than layoffs throughout the year. The Education sector was the sector that took the longest to have a balance between layoffs and admissions, returning to present a second peak in December.

Figure 5. Net vacancy destruction rate, by gender and sector, January to December 2020
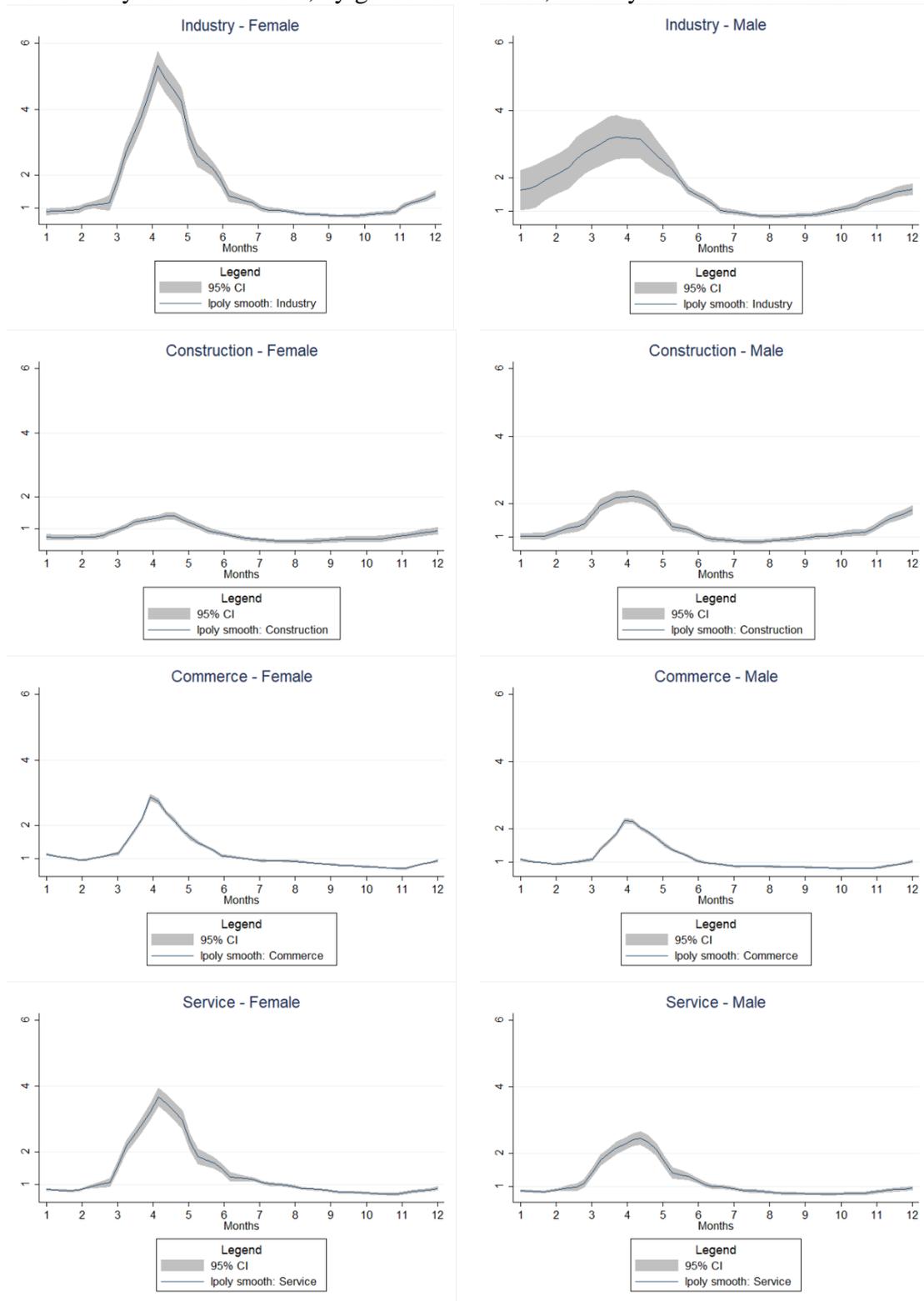
Continue

Figure 5. (Continuation)
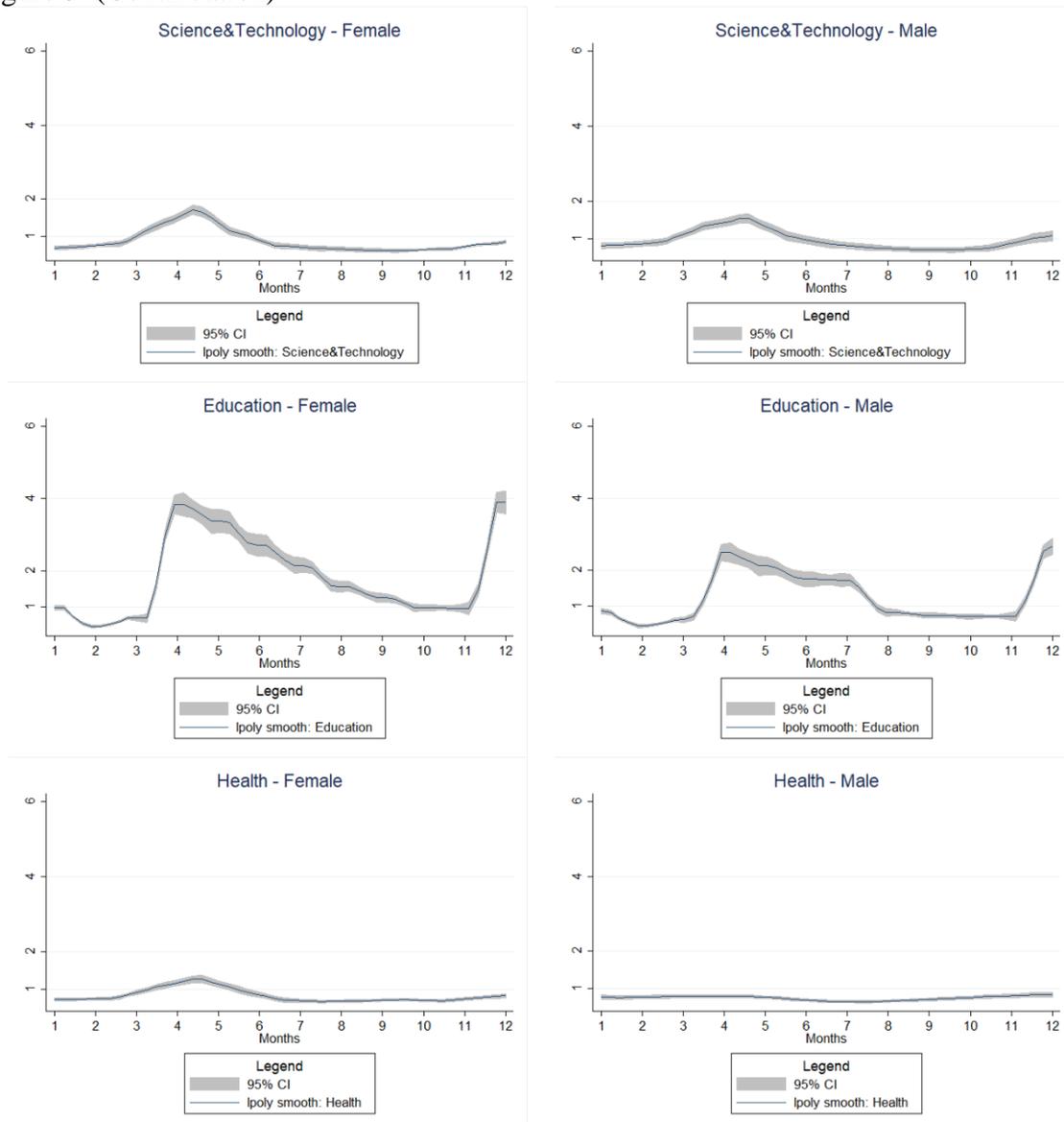
Source: Research Results

Figure 5 verifies the inequalities between men and women in almost all sectors. Exceptions are in the Science and Technology and Health sectors, whose behavior was similar for both groups, where there was virtually no excess of admissions against layoffs. The only sector in which women had the lowest destruction rates was Construction, but there is a low female movement share in this sector.

The decomposition results for the municipal averages are present in Table 5. Due to the difference in the net job destruction rate in the pre-social distance period, the average for women is lower than that of men, being the admissions higher than layoffs in February. In this period, only the composition effect is meaningful, indicating that observed characteristics, as a higher proportion of women with a complete university education or women in sectors with more admissions than layoffs (Services, Education and Health), are favorable to a lower their rate of destruction of net vacancies.

From April, it turns out that the process of job destruction is hams both genders but has greater weight on women, with a rate 3.5 times higher than in March, compared to 2.7 for men. However, specifically in April, the explained part of the decomposition is not statistically significant, indicating that only the effect responsible for the difference in averages is the structural (not explained), whose gap due to it is 0.69 jobs destroyed more for the female public. Thus, in a situation where men and women have the same productive characteristics observed, the not observed factors associated with traditional thinking (domestic tasks, human capital effects, psychology, among others) contribute more to reducing men the rate of job destruction than women.

Table 5. Decomposition gender gaps in net movement, January to December 2020

	January	February	March	April	May	June	July	August	September	October	November	December
Male	1.1678***	1.4662***	1.5497***	3.2151***	1.8721***	1.1235***	0.9321***	0.9502***	0.9410***	0.9952***	1.2732***	1.6716***
	(0.033)	(0.228)	(0.109)	(0.173)	(0.056)	(0.025)	(0.020)	(0.031)	(0.041)	(0.034)	(0.057)	(0.108)
Female	1.0053***	0.9045***	1.2282***	3.7510***	2.1915***	1.2966***	1.0176***	0.9448***	0.8727***	0.8023***	0.8293***	1.3105***
	(0.024)	(0.025)	(0.027)	(0.140)	(0.075)	(0.036)	(0.021)	(0.020)	(0.018)	(0.019)	(0.022)	(0.045)
difference	0.1624***	0.5617**	0.3215***	-0.5360**	-0.3194***	-0.1731***	-0.0855***	0.0054	0.0684	0.1929***	0.4439***	0.3612***
	(0.041)	(0.229)	(0.112)	(0.223)	(0.094)	(0.044)	(0.028)	(0.037)	(0.045)	(0.039)	(0.061)	(0.117)
Explained	0.1679***	0.3651***	0.3900***	0.1500	0.2339***	0.1040***	0.0717***	0.1590***	0.1298***	0.1798***	0.2979***	0.5689***
	(0.040)	(0.094)	(0.059)	(0.162)	(0.067)	(0.035)	(0.024)	(0.056)	(0.044)	(0.037)	(0.039)	(0.123)
Unexplained	-0.0055	0.1966	-0.0685	-0.6860**	-0.5533***	-0.2772***	-0.1573***	-0.1536***	-0.0615*	0.0132	0.1460**	-0.2078***
	(0.054)	(0.157)	(0.092)	(0.344)	(0.127)	(0.062)	(0.035)	(0.044)	(0.036)	(0.048)	(0.061)	(0.079)
Observations	9025	9200	9091	7677	7790	8066	8473	8615	8777	8900	8741	8433

Source: Research Results. Note: Robust standard errors in parentheses p<0.01, ** p<0.05, *p<0.1

The negative gap persists from May to July, although the explained part is again favorable to women. Nevertheless, the unexplained component indicates that if the productivity characteristics were equal, on average, the return characteristics would contribute less to reduce the ratio between layoffs and admissions of women.

In August, the differences in results between men and women are no longer significant, returning to a favorable scenario for women in October. However, starting for decomposition in terms of factors explained (composition effect) and unexplained (structural effects), one can perceive how much the whole period was harmful to women, especially in terms of the unobserved component of inequality (except for October and November).

From August until November, women go through a scenario of net job creation (admissions greater than layoffs), which is interrupted in December. Despite the women still having a lower rate of job destruction, it is possible to see that it is due to the effects of composition when looking at the unexplained part. For the unexplained part of the decomposition, the gap between men and women would be negative, indicating that women had 0.21 job destruction more than men due to factors structural factors.

Table 6 shows the composition and return effects by observed variables, considering the most C19p critical months (April, May, June, and December). This table shows a more detailed look at how the group and sector characteristics contribute to inequality between men and women.

Concerning the movement share explained, the average proportion of women with complete university education being higher than men share contributed to them having fewer layoffs per admissions, with a difference of 0.06 to 0.25 jobs destroyed more for men. Another favorable factor is the lower female movement share in the Industry sector that had more layoffs than admissions throughout 2020.

Moreover, except April, the health net positive job creation throughout the C19p period was favorable for the women net ratio not to present an even higher net job destruction rate than men in May and June, considering that women had a meaningful movement share than men through 2020. It is also an essential factor because women had more admissions through dismissal in December than men's results.

Regarding unfavorable factors to women, the effect of the service sector in April stands out, which contributed to 0.47 vacancies destroyed less in the average difference between the rates of men and women. These findings are because the women's average allocation in the Service sector, the second sector with more layoffs than admissions in that month (Table 4), is higher than that for men's averages.

The average Service sector's weight had in the explained part verified its contribution to annul the favorable factors, making the composition effect not significant in the final decomposition. However, in December, the predominance of factors favorable to women (proportion of women with university education and allocation in sectors with fewer layoffs than admissions) was responsible for having a positive value, indicating a higher net rate of jobs destruction for men.

Regarding the unexplained part of the decomposition (Table 6), the findings show that most of the significant effects are unfavorable to women since the negative sign indicates decreases in the difference in the mean rate of men about that of women, showing a lower explanatory variable for men's results (reduces their ratio between layoffs and admissions).

We highlight the return of the age groups of 30-34 and 35-40 years, contributing to women having more vacancies destroyed in April and May than men. Although the database does not contain specific family information, since it was considered an age group in the childbearing age phase, these may be the factors not observed that influence such differences, and one can perceive the penalty suffered by women.

Regarding schooling, especially for the month with more critical results (April), it is noted that the return is lower for the rate of destruction of vacancies of men, indicating that, assuming equality in the proportion of individuals, of both genders, with high school or university education, men had fewer layoffs than women. In December, even with the observable characteristics of women being favorable, they presented returns that contributed to the average ratio, layoffs per admissions, being higher than one, emphasizing the return of being in the Industry, Services, Education and Health sectors. It is essential to highlight that although it presents the lowest rates in the Health sector, there are unobserved factors that can lead to a greater dismissal of women.

Table 6. Decomposition gender gaps in net movement by explanatory variables, critical months 2020

Variables	April		May		June		December	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
study5	-0.0594**	-0.2211**	-0.0361*	-0.1124*	-0.0051	-0.0126	-0.0798	-0.1524
	(0.030)	(0.103)	(0.021)	(0.067)	(0.014)	(0.042)	(0.050)	(0.119)
study7	0.0846**	-1.4677**	0.0485***	-0.4064	0.0094	-0.0931	0.0789**	-1.3021*
	(0.040)	(0.744)	(0.015)	(0.317)	(0.007)	(0.163)	(0.040)	(0.791)
study9	0.2670***	-0.2034***	0.1839***	-0.0226	0.0632***	0.0133	0.1407***	-0.2009*
	(0.033)	(0.070)	(0.026)	(0.046)	(0.014)	(0.025)	(0.052)	(0.107)
Age 25-29	-0.0204**	0.0411	-0.0120***	-0.1313	-0.0008	-0.0591	-0.0038*	0.1181
	(0.008)	(0.224)	(0.005)	(0.082)	(0.002)	(0.050)	(0.002)	(0.077)
Age 30-35	0.0015	-0.3516*	-0.0003	-0.1460*	0.0028	-0.0971*	0.0051*	0.0446
	(0.004)	(0.190)	(0.005)	(0.089)	(0.003)	(0.051)	(0.003)	(0.092)
Age 35-40	0.0168**	-0.3353*	0.0264***	-0.1926*	0.0159***	-0.0624	0.0223*	0.0747
	(0.008)	(0.196)	(0.007)	(0.099)	(0.004)	(0.064)	(0.012)	(0.133)
Industry	0.2840***	-0.5775	0.0916***	-0.5412***	0.0369***	-0.2216**	-0.0701	-0.5403*
	(0.057)	(0.441)	(0.024)	(0.201)	(0.011)	(0.087)	(0.057)	(0.288)
Construction	0.0899***	0.0484*	-0.0451	-0.0003	-0.0146	-0.0001	-0.1076	-0.1082*
	(0.034)	(0.027)	(0.035)	(0.027)	(0.020)	(0.013)	(0.098)	(0.063)
Commerce	-0.0618*	0.3457	0.0176	-0.1778	0.0048	-0.0845	0.3403***	-0.7428
	(0.034)	(0.216)	(0.033)	(0.194)	(0.014)	(0.076)	(0.119)	(0.484)
Services	-0.4702***	0.6680	-0.0626*	-0.0600	-0.0241**	-0.0652	0.1611***	-0.3507*
	(0.123)	(0.480)	(0.032)	(0.101)	(0.012)	(0.045)	(0.062)	(0.191)
Science	-0.0001	-0.0022	0.0053**	-0.0159	-0.0042	-0.0243	0.0009	0.0590
	(0.003)	(0.019)	(0.002)	(0.012)	(0.003)	(0.022)	(0.012)	(0.076)
Education	-0.0119	-0.0395**	-0.0244***	-0.0188	-0.0081	-0.0008	-0.0241	-0.0763*
	(0.010)	(0.017)	(0.009)	(0.013)	(0.005)	(0.008)	(0.036)	(0.046)
Health	0.0300	-0.0155	0.0412**	-0.0323	0.0279***	-0.0224**	0.1051***	-0.0786*
	(0.023)	(0.023)	(0.018)	(0.021)	(0.008)	(0.009)	(0.034)	(0.043)
Total	0.1500	-0.6860**	0.2339***	-0.5533***	0.1040***	-0.2772***	0.5689***	-0.2078***
	(0.162)	(0.344)	(0.067)	(0.127)	(0.035)	(0.062)	(0.123)	(0.079)

Source: Research Results. Note: Robust standard errors in parentheses p<0.01, ** p<0.05, *p<0.1

Despite the limitation of the available database, the literature can help understand what is behind this unexplained gap, which proves harmful to women, in almost the entire C19p in 2020. Women in the age group analyzed are highly likely to be mothers of young children (Bhat et al., 2007). According to Goldin (2014), this can reduce the investment in women, as their employer's risk-taking of losing their female employee increases at the age range analyzed (19-40). Thus, in the political context compared with the findings of this paper, the C19p reveals an association between the employer's behavior and the job destructions with a preference for the male workforce, as after the political implementations (Provisional Measures 936, 944 and law 13,999), the Brazilian labor market has more significant job destruction for workforce female.

Although there is no empirical test, our findings talk to the Manning and Swaffield (2008) results, as the unexplained part may be associated with: the employer's cost of training with the worker in the past (Human Capital effect), women are less likely to change jobs (no Job-Shopping effect), and cultural factors, where women subjugate themselves inferior to men (Psychological effects).

Another factor that deserves reflection is that housework (traditional thinking in some literature) may reduce women's productivity, as the C19p may double the woman's journey (Reichelt, Makovi, and Sargsyan, 2021). Specifically for the sectors, even located in the Health with more negligible C19p effect on jobs destruction, the structural effect (not observed) is still negative, indicating that women have more layoffs than men in two months that had net destruction of vacancies (June and December).

5. FINAL REMAKES

This article contributes to the debate on the gender gap, analyzing the context of the crisis imposed by the COVID-19 pandemic (C19p). We understand that in times of crisis, before looking at wages, we must look at the survival of jobs because, in this way, the maintenance of progress acquired, about the gender gap, over the years can be recovered more quickly at the end of the state of public calamity. Thus, we assess how was, on the average of Brazilian municipalities, the gender behavior in the Brazilian labor market as a response to the economic effects of the C19p. We found evidence that the initial months were harmful to all formal workers but had even greater weight on women. Thus, another relevant contribution is in the inequality decomposition, where the findings show that it is largely due to structural effects.

Even presenting more favorable observable characteristics than men, such as a higher proportion of individuals with a university education or low allocation in most affected sectors (Industry) and high participation in the Health sector, women had higher net movement indicating job destructions in almost all months of 2020. For example, between March-April 2020, the net movement increases 2.5 jobs in the ratio of layoffs per admission to women against 1.7 for men.

The inequality decomposition shows that from April, the structural effect becomes relevant in explaining this gap. It is interesting to note that this month the restrictive measures were imposed and that the difference in the rates of net destruction between men and women is due, in its entirety, to factors not observed. In almost all other months after isolation measures, the decomposition shows that these effects were meaningful for the gender gap, being favorable to men. The structural effect indicates that even if men and women had similar observed characteristics, women would be more impaired with schooling level and age group.

Considering the employment maintenance policies implemented between April and May 2020 (Provisional Measures 936 and 944 and Law 13,999), there is a strong association between our results with employers' behavior described by human capital literature, as in the process of job destruction is unfavorable for the women.

Despite the limitation of specific data in the NCAGED database on the composition of workers' families or time allocation in domestic activities, the decomposition of the rates of job destruction showed that there are indications of how such factors not observed may have contributed to this process, due to the restrictive measures imposed by the C19p scenario.

Future research could delve into such issues, considering the fall in well-being caused by the growing unemployment scenario. Specifically, to NCAGED, it can be relevant to analyze how the process of destruction of vacancies took place by a type of dismissal because this research does not distinguish

whether these were voluntary or not. Thus, the analysis of the bargain between employee and employer can complement our analysis. In addition, the limitations imposed by the new working conditions may contribute to the decision to remain or not in jobs, especially for women.

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