Influence of Political Support and Performance in response to COVID-19 on Unemployment Rate in Brazil

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Abstract: This paper aims to test the association between the voters' support for President Jair Bolsonaro, the performance in response to COVID-19, and unemployment rates in Brazil using a regression model. We found evidence that lower performance in response to COVID-19 raised unemployment only in states where voters supported the president. We estimate that a positive shock of 10% in the mortality rate increased the average unemployment by 0.9% (p < 0.01) in states that supported president Jair Bolsonaro. There is evidence that supporters of the president tend to follow the directives of their leader and conduct accordingly.

Keywords: COVID-19, Unemployment rate, Political Support and Brazil

1. Introduction

The Coronavirus Disease 2019 (COVID-19) pandemic has led to an unprecedented health and humanitarian crisis worldwide. More than 245 million cases and 4.9 million deaths associated with COVID-19 have been reported, with the highest number of deaths registered in the USA, Brazil, and India. In Brazil, the impact of COVID-19 has been disproportionate in highly dense areas (Martins-Filho, 2021)and among vulnerable populations (Martins Filho et al; 2020; 2021). In addition, the politicization of the pandemic, ideological attitudes, and the lack of national coordination and comprehensive, evidence-based public health guidelines to control the spread of disease caused a devasting economic and social disruption in the country.

To face the impacts of COVID-19, the federal government in Brazil implemented a set of economic policies, which included support for the most vulnerable people, relaxation of labor laws to maintain jobs, aid for informal and self-employed workers, tax extension, and financial support to states and small and medium-sized companies. However, despite

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the stimulus package, the Brazilian unemployment rate hit a record high of 13.5% in 2020, affecting more than 13 million people (IBGE, 2020).

In this study, we test the association between the voters' support for President Jair Bolsonaro, the performance in response to COVID-19, and unemployment rates in Brazil. Given the strong heterogeneity of the economic and social structure among Brazilian states and the autonomy of local governments to deal with the pandemic, we expect that the economic effects of COVID-19 are heterogeneous across the country. Moreover, we assume that voters adopt the strategy of "following their leader" so that the influence of performance indicators against COVID-19 on the unemployment rate depends on the level of political support.

2. Econometric Strategy

This is a nationwide population-based ecological study conducted to examine the influence of political support and the performance in response to COVID-19 on the unemployment rate of Brazilian states. To explore this relationship, we estimate an econometric model using the following variables: (a) response variable: the unemployment rate of each Brazilian statefor the last quarter of 2020; (b) independent variables: COVID-19 mortality as a proxy of performance in response to COVID-19 (García-Basteiro et al., 2020)) and the results of 2018 presidential election as a proxy of political support; and (c) control variables: population density, the human development index as a proxy of economic development, and the social isolation index as a proxy of social distancing.

To estimate the incidence and mortality rates of COVID-19, we extracted data on confirmed cases and deaths from the de-identified microdata catalog and official bulletins of the 27 Brazilian states' health department websites until December 31, 2020. Incidence and mortality rates were calculated based on the population estimate provided by the Brazilian Institute of Geography and Statistics (IBGE) (https://www.ibge.gov.br). Population density, the human development index, and the unemployment rate for the last quarter of 2020were also obtained from the IBGE statistics. Social distancing was measured using the geolocation index (namely the social isolation index) provided by a geo-tracking advertising software supplier and (https://mapabrasileirodacovid.inloco.com.br/pt/). Political support was defined as a dummy variable equal to"1" for states where Bolsonaro had the highest number of valid "0" votes in the 2018 presidential election and otherwise (https://www.tse.jus.br/eleicoes/eleicoes-2018). To estimate the effects of COVID-19 mortality on the unemployment rate of Brazilian states, we assume that the response follows a beta distribution (Ferrari and Cribari-Neto, 2004; Smithson and Verkuilen, 2006) with parameters λ and θ :

$$f(ur;\lambda,\theta) = \frac{\Gamma(\mu+\theta)}{\Gamma(\mu)\Gamma(\theta)} ur^{\mu-1} (1-ur)^{\theta-1}$$
(1)

where ur is the unemployment rate, $ur \in (0,1)$, $\Gamma(\cdot)$ is the gamma function, $\mu = E(ur|\mathbf{x})\varphi, \theta = [1 - E(ur|\mathbf{x})]\varphi, \varphi = \mu + \theta, \mathbf{x}$ is the vector of covariates, $E(ur|\mathbf{x})$ is linked to the covariates by the link function $h[E(ur|\mathbf{x})] = \mathbf{x}\beta$, and the conditional variance is given by $Var(ur|\mathbf{x}) = E(ur|\mathbf{x}) [1 - E(ur|\mathbf{x})]/(1 + \varphi)$. The parameter φ scales the conditional variance and may also be linked to the covariates by the link function $g[\varphi] = \mathbf{x}\alpha$. We propose the following linear form for the link function of the conditional mean:

$$h[E(ur|\mathbf{x})] = \beta_0 + \beta_1 ps + \beta_2 \log mr + \beta_3 \log ir + \beta_4 si + \beta_5 (ps \times \log mr) + \beta_6 (ps \times \log ir) + \beta_7 (ps \times si) + \delta_1 \log pop + \delta_2 di$$
(2)

where ps is the political support for the federal government, mr is the COVID-19 mortality rate, ir is the incidence rate, si is the social isolation index, pop is the population density, and *hdi* is de human development index. We test the logit link function for the conditional mean and the log link function for the scale of the conditional variance. We assume that the relationship between the unemployment rate andCOVID-19 mortality is heterogeneous and depends on the level of political support for the current Brazilian president, Jair Bolsonaro (interaction effects). According to Cabral et al. (2021), the municipalities where Bolsonaro received most of the votes in the 2018 presidential election were the most affected by COVID-19. In this sense, we also assume that the incidence rate and the social isolation adherence also depend on the level of political support. Table 1 shows the descript statistics.

Variables	Mean	Std. Dev.	Min	Max
ur	0.1375	0.0368	0.0533	0.2004
ps	0.5925	0.5007	0	1
mr ps = 1	103.825	27.475	56.2	147.9
mr ps = 0	85.781	16.091	61.4	109.4
ir ps = 1	5374.025	2344.338	2517.5	11339.3
ir ps = 0	3746.591	974.632	2324.6	5744.8
si ps = 1	.4077	.018	.3760	.4419
si ps = 0	.4037	.015	.3653	.4219
logpop	3.238	1.529	0.6981	6.096
hdi	0.7712	0.0506	0.6770	0.8740

 Table 1: Descriptive Statistics

To test the robustness of the results, we also estimate a Bayesian beta regression using the adaptive Metropolis–Hastings algorithm. We use 25,000 Markov chain Monte Carlo (MCMC) iterations, a burn-in period of 15,000, and assume a conjugate prior N(0, 10) for the model parameters.

3. Results Discussion and Conclusions

Until December 31, 2020, the highest COVID-19 mortality rates per 100,000 inhabitants were observed in states located in the Southeast, Midwest and North regions of the country and included Rio de Janeiro (147.9), Distrito Federal (141.3), Roraima (128.9), Mato Grosso (127.9), and Amazonas (127.5). As shown in Figure 1, the level of political support for the Brazilian president measured by valid votes in the 2018 election was lower across the Northeast region and two of the northern states (Pará and Tocantins), both considered the poorest regions in Brazil.





Note: We highlighted the border of the group comprising the 11 states where Bolsonaro lost the elections in 2018. All of them are located in the poorest regions of the country, i.e., North and Northeast.

We found evidence that lower performance in response to COVID-19 raised unemployment only in states where voters supported the president. We estimated that a positive shock of 10% in the mortality rate increased the average unemployment by 0.9 percentage points (p < 0.01) in states that supported president Jair Bolsonaro, with a 90% Posterior Interval of [.0377, .1340] estimated by the Bayesian model. The negative and significant effect of the HDI, in turn, highlights the benefits of economic development in reducing unemployment (Table 2).

	Beta Regression AME		Bayesian Beta Regression		
Variables	No interaction	Interaction	No interaction offects	Interaction offects	
	effects	effects	No interaction effects	interaction effects	
ps	.0174	.0211	Median: .0079	Median:0307	
	(.020)	(.021)	90% PI: [0243, .0499]	90% PI: [3937, .3314]	
log mr ps	.0687***	.0893***	Median: .0724	Median: .08667	
= 1	(.035)	(.027)	90% PI: [.0293, .1226]	90% PI: [.0377, .1340]	
log mr ps	.0618****	.0042	Median: .0692	Median: .0083	
= 0	(.027)	(.069)	90% PI: [.0280, .1172]	90% PI: [0609, .0720]	
$\log ir ps = 1$	0214	0244	Median:0302	Median:0292	
	(.015)	(.017)	90% PI: [0600,0005]	90% PI: [0626, .0017]	
$\log ir ps = 0$	0263	0263	Median:0288	Median:0078	
	(.031)	(.031)	90% PI: [0574,0004]	90% PI: [0448, .0304]	
si ps = 1	.2548	.4929*	Median: .0883	Median: .2154	
_	(.374)	(.290)	90% PI: [3954, .5163]	90% PI: [4163, .7027]	
si ps = 0	2290	2390	Median: .0844	Median:.1058	
-	(.356)	(.832)	90% PI: [3781, .4936]	90% PI: [3078, .5158]	
log pop	.0087***	.0100***	Median: .0072	Median: .0088	
	(.003)	(.003)	90% PI: [0007, .0148]	90% PI: [.0012, .0154]	
hdi	5625***	5506***	Median:4385	Median:4728	
	(.192)	(.219)	90% PI: [7529,1304]	90% PI: [7102,2015]	
Variance	5.275***	5.494***	Median: 4.958	Median: 5.087	
Scale	(.358)	(.290)	90% PI: [4.334, 5.538]	90% PI: [4.433, 5.640]	
Conditional	.1374	.1375	Median: .1366	Median: .1378	
Mean: ur			90% PI: [.1244, .1506]	90% PI: [.1248, .1526]	
Acceptance			33.93%	31.69%	
rate					
Average			3.68%	2.27%	
Efficiency					

 Table 2: Estimation Results

Note: Robust standard errors in parenthesis. N = 27. *** p < 0.01; ** p < 0.05; * p < 0.1. AME, Average Marginal Effects; *ur*, unemployment rate; *mr*, mortality rate; *ps*, political support; *ir*, incidence rate; *pop*, population density; *si*, social isolation index; *hdi*, human development index, PI: Posterior Interval. For the Bayesian Beta Regression, we set a random seed of 1000. No interaction effects refer to model (2) without the interaction terms between political support and the COVID-19related variables. We find no problems in the convergence of the MCMC, albeit the average efficiency rate is below 5%.

Performance in response to COVID-19 impacts the labor market in meaningful ways. An increase in the mortality rate of the economically active population represents the loss of human capital and a reduction in family size, which affects business closures and labor demand. The sudden loss of individuals responsible for the household income may

represent an obstacle for the labor marketinsertion of the remaining family members. Furthermore, the pandemic has changed the rules of labor relations, especially regarding home office activities. In Brazil, the remote work paradigm during 2020 has excluded a substantial segment of the labor force (Barberia et al., 2021).

However, president Jair Bolsonaro adopted a strategy of denial behavior during the COVID-19 pandemic. Among the various controversial statements in early 2020, Bolsonaro declared that COVID-19 was just a "small flu", that "we're all going to die someday", and that lockdowns are "job-killers" (Borges, 2020). The former Brazilian president also reiteratesthe reluctance to take the COVID-19 vaccine, is a defensor of ineffective medications and rejectsface masks (Hallal et al., 2021).

There is evidence that supporters of the president tend to follow the directives of their leader and conduct them accordingly (Gramacho et al., 2021). If supporters are in denial, the labor market might react negatively to a decline in the performance indicators against COVID-19. In addition, if voters expect the disease to be temporary, their adjustment to new labor market conditions might be delayed. Therefore, a positive shock on the mortality rate is more likely to affect unemployment in states that support the president, which aligns with our findings.

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