



When will Voters Re-elect Populists? Lessons from COVID-19 in Brazil

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Abstract

COVID-19 preceded electoral upsets in many countries, but did it cause them? Using both OLS and instrumental variable methods on granular electoral data we find that, in the case of Brazil, (i) both COVID-19 mortality and underlying cases played a significant role in reducing the incumbent candidate's votes; (ii) the absolute COVID-19 electoral penalty was stronger in more closely competitive municipalities; (iii) COVID-19 lost its *relative* importance in more competitive municipalities to factors, such as economic growth, electoral mobilization, inequality, as well as education and employment structure. As a result, while a typical voter at the national level may have been more interested in the healthcare costs of the COVID-19 pandemic, their electoral focus shifted to the economy in more competitive municipalities. This is a novel result on the electability of incumbent populists, implying changing perceptions of political competence when elections become more competitive. This result helps explain re-election strategies of incumbent populists who tend to downplay failures in managing the COVID-19 healthcare crisis and emphasize the state of the economy. Our results imply that populists can indeed boost their re-election chances if they exploit this political trade-off.

Keywords Electoral outcomes · Brazil · Populist governance · Comparative populism · COVID-19 · Contestability

JEL Classification D72 · H12 · I18 · P52 · P59

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Introduction

Economic and healthcare policies implemented to address the COVID-19 crisis served as a global test of political competence (Sabahelzain et al. 2021; Xavier et al. 2022). It is therefore not surprising that the elections that followed the COVID-19 pandemic acted as a vote of confidence on incumbent leaders (Chae et al. 2022; Pulejo and Querubín, 2021), causing widespread electoral shifts (Xavier et al. 2022) and broadly punitive outcomes (Plümper and Neumayer 2022).

In this paper, we analyze the electoral consequences for an incumbent far-right populist leader: the Brazilian president Jair Bolsonaro, who was defeated in the 2022 presidential elections. Even though Bolsonaro's campaign focus was on corruption (Feres Júnior et al. 2023), his broader rhetoric was far-right, which qualifies him as an extreme political candidate, like most populist candidates (Castanho Silva et al. 2022). When discussing what changed Bolsonaro's political fortunes, we focus on the changes in voting patterns of Brazilian municipalities between 2018 and 2022 and relate them to municipal-level COVID-19 deaths and infection rates, among other economic observables. Even though presidential election outcomes in Brazil are not determined at the municipal or state level, using municipal data in this work is preferred as it both offers the closest level of observation to the individual voter and boosts the number of observations relative to studies using state-level or national election outcomes.

In Brazil, the president is elected through a popular vote in a two-round general election, a system used across more than 70 countries (Passarelli and Bergman 2023). In this system, multiple candidates compete in the first round. If a candidate does not receive over 50% of the votes in the first round, a second (run-off) round is held where the leading two candidates compete for plurality, i.e., the candidate receiving the highest vote share wins the presidency. A brief overview of the 2018 and 2022 runoff elections is given in the table below.

We focus on Brazil primarily for two reasons. First, the Brazilian presidential elections in both 2018 and 2022 featured the same candidate: Jair Bolsonaro. This minimizes the time-invariant effect of leader charisma on electoral outcomes, which has explained the rise of populism elsewhere (Crutzen and Flamand 2023) and could therefore bias our results. In the absence of a charisma effect, the electoral outcomes of the COVID-19 disease for incumbent populists become identifiable through the variation of municipal-level observables, which creates a large database of electoral outcomes discussed below.

Second, the electoral consequences of COVID-19 in Brazil offer a case study in the growing field of comparative populism. Among other topics, the field has tackled the electoral consequences of COVID-19 for incumbent populists. This has received due attention using data from the USA (Baccini et al. 2021; Mitchell 2023), Brazil (Avritzer and Rennó, 2021), Italy (Bordignon et al. 2024), France (Giommoni and Loumeau 2022) and elsewhere in Europe (Daniele et al. 2020a, 2020b; Rovira Kaltwasser and Taggart 2024). Despite the rich evidence, it is inconclusive on the underlying mechanisms, with some populists losing support



because of voter discontent with crisis management and rising mistrust, while others gaining support because of a ‘rally around the flag’ effect and the available economic support. We contribute to this debate with evidence at a more granular municipal level, which is closer to the actual voter decision making than most published work.

As a result, what we learn from Brazil could not only offer support to general evidence on the electoral outcomes of economic and healthcare crises (Cornelson and Miloucheva 2022; Gavresi and Litina 2023; Lange and Monscheuer 2022), but could plausibly extend the evidence to politics governed by populists, potentially offering lessons about re-electability of incumbent populists. Given the broader rise in extremist voting preferences, this could be a timely case study in the literature on comparative populism (Bonikowski et al. 2019; Roberts 2022) and, perhaps more consequentially, the factors affecting its post-pandemic electoral dynamics. Our results show that electoral shifts due to COVID-19 were more pronounced in more contested municipalities, which is a novel result on the impact of severity of COVID-19 on electoral outcomes, particularly for elected populists. We also find that, after a large-scale crisis like the one imposed by COVID-19, voter concerns over political competence of populists prevail over their firebrand appeal, even if competence may not be their most attractive *ex ante* characteristic (Di Tella and Rotemberg 2018). This result has two contributions. First, it informs of the underlying mechanism behind post-pandemic electoral changes for incumbent populists. Second, it carries lessons for both incumbent populists and potential candidates running on extreme political platforms.

The paper proceeds with a more detailed review of the relevant literature and the prevalent methods to study the impact of COVID-19 on voter outcomes. Following that, we present our methods, results and robustness checks before drawing conclusions.

Related Literature

This paper contributes to three lines of literature: The electoral consequences of the COVID-19 pandemic, voter behavior during crises, and comparative populism, both in the general and in the Brazilian case. The review below sets the stage for our contributions.

COVID-19 has affected electoral outcomes for many incumbent candidates, as well as their re-election strategies. Faced by this threat, incumbents will seek to promote their credibility for crisis management while maintaining a functioning economy. Pulejo and Querubín (2021) illustrate this trade-off with cross-country data at various proximities to a general election. They find that governments tend to forgo concerns over COVID-19 as an election approaches and opt for less stringency, prioritizing economic concerns.

Cross-country evidence has been complemented by case studies. For example, Pop (2022) studied the 2020 US election and determined that key factors behind the incumbent’s loss were unemployment and health. Joe Biden’s success, the paper suggests, was partly due to his commitment to business support, debt



forgiveness, healthcare reforms, and tax plans. These issues became more significant for voters due to the uncertainty brought about by COVID-19. Mitchell (2023) supported this analysis, finding that the evolution of the pandemic reduced electoral mobilization in the USA while emphasizing economic concerns.

The impact of COVID-19 on electoral mobilization and voter turnout has been extensively studied. Fernandez-Navia et al. (2021), using data from the Spanish Basque region, found that municipalities more affected by the pandemic saw a decrease of up to 5% in voter turnout, with an increased preference for nationalist parties. The data was collected for 251 municipalities in the region. Similar findings were reported for the USA (Simonov et al. 2022), who noted that nationalist rhetoric mobilized voters, possibly due to more extreme media rhetoric and social media influences (Bursztyn et al. 2020). Right-wing voters, as Simonov et al. (2022) and Bursztyn et al. (2020) observed, tended to downplay the COVID-19 threat to public health and were less likely to adhere to stay-at-home orders. Adam-Troian et al. (2023) drew similar conclusions using municipal data from France. They found that the perceived threat of COVID-19 boosted voter turnout for right-wing parties. This effect may be related to the strategies of populist leaders, as noted by Pulejo and Querubín (2021), who found that such leaders aimed to reduce the severity and duration of government containment measures, especially in the early stages of the pandemic when stay-at-home orders polarized voters across the globe (Stankov 2024).

Brazil was one such nation with significant polarization over the lockdown measures that was hit unexpectedly hard by the pandemic. Xavier et al. (2022) studied voting and mortality data in Brazil from February 2020 until June 2021, capturing the first and the second wave of the COVID-19 pandemic. They point to a strong connection between COVID-19 and voting patterns, with municipalities hit harder by COVID-19 more likely to have supported Bolsonaro in the 2018 election. The study shows that the initial wave predominantly affected larger urban centers, while the subsequent wave affected disproportionately municipalities with strong Bolsonaro backing. This was attributed to higher levels of scientific denialism in these areas (Ferrante et al. 2021), which experienced some of the country's highest mortality rates during the second wave of the pandemic. Bayerlein et al. (2021) also question the competence of populist leaders during a pandemic, who are less likely to implement containment measures and more likely to fuel lower adherence to them.

The dual healthcare and economic shocks during the COVID-19 pandemic was expected to affect voting outcomes, as political preferences typically react to shocks (Cunha et al. 2022; Stankov 2020). Much of this literature is based on the 'Responsibility Hypothesis' (Lewis-Beck and Paldam 2000; Nannestad and Paldam 1994), which contends that voters hold governments responsible for economic shocks, and a negative economic shock is likely to trigger a punitive vote against the incumbent. Cole et al. (2012) explain this by arguing that voters attribute deteriorating economic conditions to the incumbent government, even when caused by external factors like natural disasters. Nevertheless, they note that fewer voters are inclined to penalize the current government if it demonstrates strong and consistent leadership in addressing a crisis. This suggests that voters are more likely to reward their incumbent government for swift action and punish it for inactivity.



Brazilian politics has long been divisive, polarized, and plagued by corruption down to the municipal level (Brollo and Troiano 2016), where mayors are more likely to increase temporary public employment, as well as cash transfers (Brollo et al. 2019) before elections. Thus, given the high distributional and social costs of the pandemic (Bayar et al. 2023), reliance on public transfers naturally becomes an explanatory factor around elections.

Several additional socio-economic factors contribute to the local electoral outcomes for a populist incumbent in Brazil: voter education, inequality, as well as the local industrial structure. Higher education is generally associated with lower populist support, and increasing educational opportunities is instrumental in the effort to counter the effects of populism (Demirci 2023). Therefore, access to higher education can counter the propagation of unsubstantiated claims often pedaled by the populist leaders. In the case of Brazil, education has seen regressive policy reforms since the 1980's (Alves et al. 2021), with a higher emphasis of religious and moral beliefs, which has become a productive platform for populist agendas.

Inequality is another central issue in the populist narrative (Stankov 2018; Strobl et al. 2023). Many populist leaders tend to mobilize voters around inequality and yet, when in power, tend to have no effect on its decline. In addition, inequality is correlated with the size of the public sector (Fedotenkov and Idrisov 2021), which justifies its inclusion in our empirical estimation.

Populism in Latin American countries is also more potent due to the underlying industrial structure (Absher et al. 2020; Pan 2023), where many firms and labor unions are largely sensitive to political influence (Marzetti and Spruk 2023). For example, the agricultural sector tends to be at the forefront of political interests, and catering to the needs of the agricultural businesses is a factor for presidential stability (Mendes Motta and Hauber 2023; Pompeia 2020). In Brazil, this sector has received ample support from Bolsonaro who defended agribusiness interests while weakening environmental protection agencies (Mendes Motta and Hauber 2023).

Main macroeconomic and demographic indicators have also been associated with populist electoral shifts. For example, higher unemployment rate is associated with a boost to left-wing populism (Algan et al. 2017; Stankov 2018). Voter income (Barberia et al. 2022; da Fonseca et al. 2021) and government spending (Nguyen et al. 2023) are additional factors that affect electoral outcomes for populists, particularly around crisis times. In addition, population growth and voter mobilization have been used to explain the effect of COVID-19 on both municipal electoral outcomes (Xavier et al. 2022) and state-level electoral outcomes (Baccini et al. 2021). This will become relevant to our empirical model.

Because of the growing role of electoral competition in Brazil between 2018 and 2022 (See Table 1), our model focuses on municipalities at varying levels of contestability. We define contestability as a feature of electoral processes or outcomes, which grows incrementally when the margin of victory between two or more competing candidates declines (Dash et al. 2019).¹ Miller et al. (2022) offer a similar approach for the 2020 US election and find that, within the most

¹ Used in this way, the concept is identical to electoral competition, hence the interchangeable use in this work. Also see Brock (1983) for a review of the conceptual origins of contestability in the economics literature.



Table 1 Brazilian Presidential Elections in 2018 and 2022, runoff round

Variable\Election round		28 Oct. 2018		30 Oct. 2022
Population (total)		210,147,125		213,317,639
Number of votes (total)		104,653,352		118,254,653
Voter turnout (% of Popul.)		49.80		55.44
Municipalities (total no.)		5570		5570
Municipalities with victory margins lower than	Number	% votes	Number	% votes
10.00%	1362	20.49	1916	47.23
5.00%	695	9.67	1008	28.20
2.50%	331	3.70	484	8.21
1.25%	165	1.05	228	4.59
0.50%	69	0.39	94	2.64

The data is from the second (runoff) round in each election. The data on municipalities at varying victory margins shows the number of municipalities and vote share (out of the total number of nationwide votes) cast in municipalities where the margin of victory was smaller than 10%, 5%, 2.5%, 1.25% and 0.5%, respectively. The data is fully described in the Data section below. The table demonstrates the rising importance of closely contested municipalities between the two elections.

contested states, the deciding factor was the state of the COVID-19 pandemic. This is further supported by Baccini et al. (2021) whose coverage of swing states show that Trump likely would have won, had the COVID-19 cases been at least 5% lower. This suggests that the severity of COVID-19 was salient to voters in the 2020 US election, a hypothesis for which we offer supporting evidence from Brazil.

The political outcomes of the COVID-19 pandemic have been studied using a mix of ordinary least squares (OLS) regressions at cross-country (Giebler et al. 2021; Pulejo and Querubín, 2021) or sub-national level (Barberia et al. 2022; Fernandez-Navia et al. 2021), weighted least squares (Mitchell 2023), two-stage least squares (Baccini et al. 2021; Castro et al. 2021), and difference-in-difference methods (Fernandez-Navia et al. 2021). The measured outcomes are typically the vote shares cast for various political parties (Fernandez-Navia et al. 2021) or the difference between the vote share at the election during COVID-19 and the one before COVID-19 (Baccini et al. 2021).

We use a mix of the above approaches to understand how the severity of COVID-19 measured by deaths and number of infections affected electoral outcomes at the municipal level in Brazil. We initially adopt OLS methods and then extend them with 2SLS estimations, as detailed in the next section. The data we rely on features a set of socio-economic covariates observed at the same level as both electoral outcomes and COVID-19 severity. This creates a more detailed profile of the local election communities and allows for observing electoral outcomes closer to the level where voting decisions would normally be made.

Our paper follows Baccini et al. (2021) who use the difference in Trump's vote share between the 2020 and 2016 elections. Similarly, we use the margin of



victory relative to the previous elections in Brazil to capture how the changes in our variables influenced the voting patterns in the 2022 election after the onset of the COVID-19 pandemic. To improve comparability across elections and mitigate potential strategic voting (Bouton 2013; Pons and Tricaud 2018), the electoral outcomes are considered on the second round of the presidential elections only, where voters choose between the last two remaining candidates.

In addition, we focus on how the vote share for the incumbent candidate has changed between the two runoff election rounds in 2018 and 2022 in more strongly contested municipalities. This contributes to the literature on electoral outcomes in competitive areas, particularly for populist candidates. The methodology for this contribution follows below.

Methodology

We expect the incumbent candidate to lose support in the wake of the COVID-19 pandemic. As the COVID-19 crisis had at least two dimensions—economic and healthcare—we include variables measuring the severity of COVID-19 and economic performance in the years before the re-election campaign. This is done for two reasons. First, because many voters may accept higher mortality if this helps reduce the economic costs of the pandemic. Second, the within-country variation in mortality rates likely depends not only on the severity of the pandemic, but also on key demographic parameters. We therefore include additional municipal-level covariates to capture those. We also expect that government spending and voter income will be positively correlated with support for the incumbent government in the presence of additional demographic and industry observables. The following section spells out the empirical strategy.

Model

Baseline Estimation

Our benchmark model studies the change in Jair Bolsonaro's victory margins at the municipal level between the 2018 and 2022 elections as follows:

$$\Delta VM_m = \beta_0 + \beta_1 CD_m + \beta_2 G_m + \beta_3 PE_m + \beta_4 P_m + \beta_5 EM_m + X_m \beta_6 + \beta_s + u_m, \quad (1)$$

where ΔVM_m is the percentage-point difference in the margin of victory for Bolsonaro from 2018 to 2022 for municipality m ; CD_m is the COVID-19 severity measured as the cumulative number of COVID-19 deaths per 100 citizens of the population in municipality m ;² G_m , PE_m , and P_m are the 4-year average real GDP per capita (GDP/capita) growth, public expenditure growth and population growth, respectively, between 2018 and 2022 in municipality m ; EM_m is the change in

² In one of the robustness checks, we use the number of COVID-19 cases to measure the disease severity.



electoral mobilization, i.e., the change in the share of eligible voters who ended up voting as a percentage of the total population over 18 years of age in municipality m between 2018 and 2022; X_m is a vector of average growth rates in agriculture, industry and services in municipality m between 2018 and 2022; β_s is a state-level fixed effect, and u_m is an error term.

Even if the model explains a fair share of the variation in the Brazilian electoral outcomes, additional socio-economic factors may have played a concurrent role, as the literature on Brazilian elections has shown. For example, Schneider et al. (2019), Xavier et al. (2022) and Moisés (1993) use public expenditure data to gauge the influence in electoral outcomes. In addition, they use census data such as the Gini Index and levels of education, which justifies the inclusion of these variables in this work. Fiscal support during the COVID-19 crisis was found to influence systemic trust characteristics (Poma and Pistoiresi 2024), providing justification for its inclusion in the estimation models. Including public expenditures is also justified as incumbent populists may use fiscal tools to boost re-election chances (Stankov 2025).

Factors such as education, income inequality, structural employment characteristics and the share of rural population, are also suitable in explaining electoral outcomes in Brazil. We did not include them in the benchmark model as the last time they were observed at the municipal level was 2010.³ Therefore, we could not directly observe their *change* before the 2022 elections. As each of these additional covariates is observed once for each municipality, they capture longer-term socio-economic characteristics, which may still play a role in electoral outcomes. Therefore, we included their latest observable values from the 2010 census data to estimate the following full model:

$$\Delta VM_m = \beta_0 + \beta_1 CD_m + \beta_2 G_m + \beta_3 PE_m + \beta_4 P_m + \beta_5 EM_m + X_m \beta_6 + Z_m \beta_7 + \beta_s + u_m \quad (2)$$

where the municipal-level characteristics were added in Z_m . Specifically, Z_m includes the illiteracy rate of the population aged 18 and over, the share of the population aged 25 and over with completed higher education, the Gini coefficient, the local unemployment rate, the share of employed people in the agricultural, manufacturing and the public sector, respectively, as well as the share of rural population in municipality m .

Endogeneity and IV Estimation

The empirical model above is somewhat naïve as it assumes random variation in the severity of COVID-19 across municipalities. However, both voting outcomes and the severity of COVID-19 may simultaneously depend on an unobserved component of political competence. In addition, containment measures which tend to affect COVID-19 mortality are not independent from the incidence of elections (Berlinger et al. 2024; Pulejo and Querubín, 2021), which makes the severity of

³ Brazil did not hold the intended general census in 2020 because of the COVID-19 pandemic. Instead, the census was conducted in 2022 and 2023, with key municipal-level observables remaining unpublished until June 2025. To ensure consistency, we therefore resorted to using the 2010 data.



COVID-19 endogenous to election outcomes. Therefore, we need a mechanism to isolate the exogenous variation in the severity of COVID-19 at the municipal level that is uncorrelated with the voting outcomes in the same municipality. To find it, we have created two instrumental variables: (i) the state-level average of COVID-19 mortality for all municipalities in the given state, except m ; and (ii) the state-level average of COVID-19 cases for all municipalities in the given state, except m . Using state-level averages of all municipalities, excluding m , to instrument for the COVID-19 severity in municipality m utilizes within-state correlation of mortality and case rates, but prevents simultaneous determination of both voting outcomes and COVID-19 severity at the municipal level.

At first glance, the severity of COVID-19 in municipality m and that in all other municipalities, except m , seem to measure the same phenomenon at differing levels of aggregation. However, voters hold incumbents accountable for local conditions at least as much as they do for state-level or national ones (De Benedictis-Kessner and Warshaw 2020). Therefore, we expect voter outcomes at the municipal level to be more directly correlated with the severity of COVID-19 at the same level than the state-level COVID-19 severity, particularly when a given municipality m has been excluded from calculating the average severity. Even though this approach is not without its weaknesses, it is widely adopted across a variety of fields in economics (Adão et al. 2019; Goldsmith-Pinkham et al. 2020), as well as political science (Kuipers and Sahn 2023).

The tests presented below reaffirm that our IV strategy has created both strong and valid instruments capable of satisfying standard exclusion restrictions. Specifically, each IV estimation reports a weak instrument test represented by both the Kleibergen–Paap (2006) rk statistic and the Hansen J overidentification test.⁴ The following section presents the data to execute this identification strategy.

Data

The electoral outcomes data to feed the above models is collected from the Electoral Data Repository of the Superior Electoral Court (2023), Brazil's official election statistics database. The Brazilian presidential election outcomes from the runoff rounds in 2018 and 2022 are observed in all 5570 municipalities. The runoff vote share for the same populist candidate, Jair Bolsonaro, has been used to construct the main outcome variable, ΔVM_m .

Further, the main economic and population indicators were collected from the Brazilian Institute of Geography and Statistics (IBGE 2021, 2022). This data is used to measure the average GDP/capita growth at the municipal level, G_m , the average public expenditures growth, PE_m , as well as the average population growth, P_m .

The COVID-19 infections and deaths data for each municipality came from the Brazilian Ministry of Health (MoH 2023) and contains data on both COVID-19 cases and COVID-19 deaths until October 2022, which was the month when the 2022 elections were held. The cumulative municipal-level data on COVID deaths

⁴ For a discussion of both tests and the resulting statistics, please see Baum et. al. (2007).



as of 1st October 2022 was divided by the population in the same municipality to construct the main explanatory variable, the COVID-19 deaths per 100 people, CD_m .

In addition, the data on both X_m and Z_m was taken from the Brazilian municipal-level Human Development Index repository published by AtlasBR (2023). Because of minor changes in the administrative structure in Brazil between 2010 and 2018, five municipalities appearing in the 2010 census could not be matched to electoral outcomes in the 2018 elections and were left out of the sample.

Further, to ensure the results were not driven by outliers, one percentile was cut from each tail of the distributions of the following variables: change in the margin of victory, COVID-19 mortality and case numbers, real GDP/capita growth rate, the change in electoral mobilization, as well as the growth rates in agriculture, industry and services. To check sensitivity of our main results to this data cleaning procedure, we re-run the models in one of the robustness checks, without a significant impact on the main results.

Due to the administrative changes between 2010 and 2018, the five municipalities that had been deleted from the electoral map between 2010 and 2018 affect the number of observations used in Eq. (1) and Eq. (2). The final sample used in the estimation of Eq. (1) was 4878, and the one used for Eq. (2) was 4873. The table below provides summary statistics of the variables used in both models (Table 2).

The estimation results follow.⁵

Results

Table 3 reveals the relationship between the severity of COVID-19 and electoral outcomes in Brazil. At the national level, COVID-19 mortality played a significant role in reducing Bolsonaro's victory margin between 2018 and 2022. This is seen from Model (1) where an additional death among 100 citizens would reduce Bolsonaro's margin of victory in a typical municipality by about 6.88 percentage points. The correlation grows in more contested municipalities, while retaining significance at the 5% level. Therefore, voters in more highly contested municipalities were more severely affected by COVID-19, adding to the potentially punitive effect of COVID-19 deaths on the incumbent candidate. This contributes to the evidence on the impact of COVID-19 in closely competitive elections in the USA (Baccini et al. 2021; Parzuchowski et al. 2021). In addition, the results imply that competence in managing public emergencies gains salience for voters *ex post* elections, even if it may not be a primary voter concern *ex ante*, especially for populist candidates (Di Tella and Rotemberg 2018).

Note, however, that the magnitude and significance of the mortality estimate could mislead. This is because, according to Table 2, one standard deviation (SD) in the number of deaths was just 0.12. Therefore, even if significant, a one-SD increase in the number of deaths could reduce the voting margin by 0.825 percentage points, which is just 0.15 of one SD in voting outcomes. This is not a small effect for more

⁵ Full replication guidance, data, as well as additional online material can be found at <https://doi.org/10.17632/d2txz5r4x9.4>



Table 2 Descriptive statistics

Variable	Mean	Median (P50)	St. Dev. (SD)	IQR	Min	Max	N
<i>Municipal-level observables</i>							
Δ Victory margin	-2.57	-1.66	5.46	8.58	-15.08	10.89	4878
Deaths/100 citiz.	0.25	0.23	0.12	0.17	0.03	0.62	4878
Cases/100 citiz.	17.12	16.02	8.57	13.22	2.30	40.96	4878
GDP/capita growth	4.00	3.67	5.76	6.60	-15.76	27.77	4878
Public exp gr.	1.96	1.90	2.67	3.46	-14.44	21.3	4878
Pop. growth	0.17	0.19	0.46	0.46	-4.29	3.28	4878
Δ Elec. mobil., pp	7.00	6.27	4.48	4.63	-0.44	38.36	4878
GVA Agric gr.	12.06	12.00	12.19	14.78	-27.15	54.68	4878
GVA Ind gr.	5.14	4.34	13.77	15.04	-46.26	67.53	4878
GVA Serv gr.	1.74	1.58	5.62	6.66	-16.30	23.40	4878
Unemp. Rate	6.15	5.63	3.61	4.24	0.00	38.45	4873
Illiteracy Rate	17.22	13.8	10.73	17.61	0.97	47.64	4873
% Higher Edu	5.56	4.86	3.27	3.75	0.28	33.68	4873
Gini Coeff.	0.49	0.49	0.06	0.08	0.28	0.80	4873
% Emp. in Agric.	35.21	36.05	18.29	27.73	0.18	85.12	4873
% Emp. in Manuf	9.87	6.74	9.02	10.21	0.00	65.11	4873
% Public Empl.	6.44	5.72	4.14	4.91	0.00	40.95	4873
% Rural Pop.	35.64	34.69	21.93	34.85	0.00	95.82	4873
<i>State-level observables</i>							
Income support	0.81	0.74	0.13	0.18	0.71	1.12	4878
Debt relief	0.26	0.09	0.34	0.20	0.09	1.39	4878
Economic support	20.20	16.01	9.12	4.16	13.59	56.27	4878

The table presents summary statistics of the variables used in estimation. Δ Victory margin, ΔVM_m , represents the difference in percentage-points margin of victory for Bolsonaro in the 2022 election relative to the 2018 election, which is the dependent variable in all estimations. Deaths/100 citiz., CD_m , and Cases/100 citiz., $Cases_m$, represent the total cumulative number of deaths and cases, respectively, per 100 people due to COVID-19. GDP/capita growth, G_m , is the average annual real GDP per capita growth rate from 2018 to 2022, Public exp gr., PE_m , is the growth in real public expenditures between 2018 and 2022, Pop. Growth, P_m , is the population growth between 2018 and 2022, and Δ Elec. mobil., pp, EM_m , is the percentage point difference in electoral mobilization from 2018 to 2022. The rest of the explanatory variables are: the growth rate of the real gross value added in agriculture, industry and services, the unemployment rate, the illiteracy rate of the population aged 18 and over, the share of population aged 25 and over with completed higher education, the Gini Coefficient, the share of employed persons in agriculture, manufacturing and the public sector, and the share of rural population in municipality m . Additional state-level observables used in some of the regressions complete the table. The statistics are, from left to right, Mean, Median, Standard Deviation (SD), Inter-quartile Range (IQR), Minimum, Maximum, and N (Sample Size) for the remaining municipalities after cleaning as described in the text. The state-level observables are taken from the Hale et al. (2021) data. Unless defined in the paper, full definitions are given in the online Appendix (<https://doi.org/10.17632/d2txz5r4x9.4>).

contested municipalities where every vote matters, but in a proportional electoral system is hardly the single most important factor for turning an election in favor of the opposition. In addition, this drag on an incumbent populist's electoral success is almost entirely offset by the boost received as a result of economic growth. A



Table 3 COVID-19 deaths and Bolsonaro's victory margins: Baseline OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	+/- 10%	+/- 5%	+/- 2.5%	+/- 1.25%	+/- 0.50%
Deaths/100 citiz.	-6.875*** (0.499)	-5.665*** (0.861)	-5.522*** (1.161)	-5.991*** (1.727)	-6.830*** (2.507)	-10.426** (4.662)
GDP/capita growth	0.104*** (0.018)	0.166*** (0.031)	0.196*** (0.044)	0.212*** (0.065)	0.293*** (0.100)	0.301** (0.145)
Public Exp gr.	0.047** (0.021)	0.064 (0.043)	0.051 (0.055)	-0.016 (0.085)	0.012 (0.126)	-0.422 (0.260)
Pop. growth	-1.304*** (0.130)	-1.257*** (0.246)	-1.227*** (0.329)	-0.997** (0.448)	-0.689 (0.618)	1.814 (1.160)
Elec. mobil.	-0.054*** (0.014)	-0.049* (0.026)	-0.105*** (0.037)	-0.044 (0.055)	-0.087 (0.077)	0.119 (0.151)
GVA Agric gr.	-0.016*** (0.005)	-0.030*** (0.010)	-0.047*** (0.016)	-0.059** (0.025)	-0.074* (0.038)	-0.032 (0.054)
GVA Ind gr.	-0.016*** (0.005)	-0.025*** (0.009)	-0.030*** (0.011)	-0.017 (0.016)	-0.022 (0.025)	-0.017 (0.046)
GVA Serv gr.	-0.023* (0.014)	-0.072*** (0.026)	-0.101*** (0.036)	-0.090* (0.052)	-0.133* (0.073)	-0.003 (0.117)
Constant	0.284 (1.245)	0.537 (2.230)	-3.775 (3.935)	4.434*** (0.863)	2.268** (1.053)	-1.445 (1.978)
Observations	4878	1671	884	422	202	82
Adjusted R ²	0.657	0.537	0.550	0.520	0.519	0.501

The dependent variable is the change in Bolsonaro's victory margin between 2018 and 2022. A negative change indicates a reduction in the margin (smaller vote share for Bolsonaro in 2022). GDP/capita growth is the average annual real GDP per capita growth, Public Exp growth is the average annual growth in public expenditures and Pop. growth, 2018-22 is the average annual population growth for each municipality between 2018 and 2022. Elec. mobil., 2018-22 is the percentage point change in the share of total population that has cast their vote between 2018 and 2022, GVA Agric growth and GVA Ind growth are the average growth rates of the gross value added between 2018 and 2022 in agriculture, industry and services, respectively. Full definitions are given in the online Appendix. The Full Sample in Model (1) contains all municipalities. The rest of the models restrict the sample to municipalities where Bolsonaro had won/lost with a margin of less than 10%, 5%, 2.5%, 1.25% and 0.5% of the votes in 2022, respectively. All models include state fixed effects. Robust standard errors are presented in parentheses. Symbols: *p < 0.10, **p < 0.05, ***p < 0.01.

one-SD increase in the real per-capita annual growth rate would raise the voting margin by 0.599 percentage points, which is 0.11 of one SD in voting margins. However, the growth premium voters gifted to the incumbent populist candidate grew larger in more contested municipalities, which was more than enough to offset the electoral drag placed by the severity of COVID-19.

As a result, even the more naïve OLS estimates demonstrate the existence of an electoral trade-off between the economic and healthcare costs of a pandemic, as previously shown (Alvarez et al. 2021; Fajgelbaum et al. 2021; Stankov 2024). The contribution of this work is to show that this trade-off varied with the margins of victory: While the average voter at the national level may have been more interested



Table 4 COVID-19 deaths and Bolsonaro's victory margins: 2SLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	+/- 10%	+/- 5%	+/- 2.5%	+/- 1.25%	+/- 0.50%
Deaths/100 citiz.	-7.333*** (0.963)	-6.014*** (1.663)	-5.352*** (1.814)	-6.585*** (1.881)	-9.784*** (2.441)	-11.291** (4.441)
GDP/capita growth	0.103*** (0.018)	0.164*** (0.032)	0.197*** (0.044)	0.210*** (0.063)	0.284*** (0.093)	0.297** (0.125)
Public Exp gr.	0.047** (0.021)	0.064 (0.042)	0.051 (0.054)	-0.016 (0.082)	0.033 (0.122)	-0.413* (0.225)
Pop. growth	-1.316*** (0.131)	-1.268*** (0.248)	-1.220*** (0.329)	-1.008** (0.436)	-0.736 (0.585)	1.836* (0.972)
Elec. Mobil.	-0.054*** (0.014)	-0.050* (0.026)	-0.105*** (0.036)	-0.045 (0.053)	-0.091 (0.071)	0.121 (0.126)
GVA Agric gr.	-0.016*** (0.005)	-0.030*** (0.010)	-0.048*** (0.015)	-0.059** (0.024)	-0.069* (0.036)	-0.031 (0.046)
GVA Ind gr.	-0.016*** (0.005)	-0.025*** (0.009)	-0.030*** (0.011)	-0.016 (0.015)	-0.018 (0.024)	-0.016 (0.039)
GVA Serv gr.	-0.023* (0.014)	-0.072*** (0.026)	-0.101*** (0.036)	-0.089* (0.050)	-0.135** (0.069)	-0.003 (0.098)
Observations	4877	1670	884	422	202	82
Adjusted R^2	0.081	0.064	0.059	0.043	0.002	-0.038
Kl'n-Paap	19.606	16.373	48.679	62.086	28.388	11.690
Hansen J	0.116	0.958	0.810	0.397	0.035	.1849

The dependent variable is the change in Bolsonaro's victory margin between 2018 and 2022. A negative change indicates a reduction in the margin (smaller vote share for Bolsonaro in 2022). GDP/capita growth is the average annual real GDP per capita growth, Public Exp growth is the average annual growth in public expenditures and Pop. growth, 2018-22 is the average annual population growth for each municipality between 2018 and 2022. Elec. mobil., 2018-22 is the percentage point change in the share of total population that has cast their vote between 2018 and 2022, GVA Agric growth and GVA Ind growth are the average growth rates of the gross value added between 2018 and 2022 in agriculture, industry and services, respectively. Full definitions are given in the online Appendix. The Full Sample in Model (1) contains all municipalities. The rest of the models restrict the sample to municipalities where Bolsonaro had won/lost with a margin of less than 10%, 5%, 2.5%, 1.25% and 0.5% of the votes in 2022, respectively. All models include state fixed effects. Robust standard errors are presented in parentheses. Kl'n-Paap reports the Kleibergen-Paap (2006) *rk* Wald F test for weak instruments. Hansen J is the p-value from the *Hansen J* overidentification test. Symbols: *p < 0.10, **p < 0.05, ***p < 0.01.

in the healthcare costs of the pandemic, their electoral focus shifted to the economy in more closely competitive municipalities. This is one of the key takeaways from the results in Table 3, and is a novel result on the electability of incumbent populists. This result may also help explain why populist leaders downplay their failures in managing the COVID-19 healthcare crisis, while emphasizing the state of the economy: If their electoral success depends on a few highly contested constituencies or states, this could be a winning political strategy. This result reinforces earlier conclusions that the electability of populist candidates depends primarily on economic factors (Ivanov 2023; Stankov 2018).



The rest of the effects from public expenditures, population growth, electoral mobilization and industrial structure in Table 3 are relatively small, but their estimates are consistent with previous voting outcomes (Bove et al. 2017; Brender and Drazen 2013; Cole et al. 2012; Tribin 2020). Still, the additional covariates gradually lose significance in more contested municipalities.

The baseline 2SLS estimates in Table 4 confirm the main takeaway from the electoral outcomes of COVID-19 in Brazil. At first glance, it appears that the severity of COVID-19 was the main driving force behind the electoral failure of the incumbent populist. However, because the severity varied little across municipalities, the electoral drag from COVID-19 mortality was in fact relatively small and was fully offset by the state of the economy for more contested municipalities. This offset may have been reinforced by two additional factors—the ‘rally around the flag’ effect, which boosts trust in the incumbent candidate in crisis times (Schraff 2021) and the general incumbency advantage (Lee 2008).

Table 5 extends this evidence by adding not only variables that changed between the two election cycles but also municipal-level observables from the 2010 census data (the last available census before 2022 with a full set of municipal-level controls). Adding the census data strengthens the key message in this paper—the different relative importance of crisis severity and the state of the economy at different levels of contestability—while adding new insights into the electorally significant factors for re-electing populists. The new insights are presented below.

The results in Table 5 offer further confidence that, at the national level, the severity of COVID-19 played a significant role in reducing electoral support for the incumbent populist candidate. This can be seen from the negative and statistically significant coefficient for the COVID-19 mortality. As the effect is significant at the 1%, we can be confident that the severity of COVID played some role in ousting Bolsonaro at the national level. As before, however, the coefficient is deceptively large, as a 1-SD increase in mortality could trigger a mere 0.029 of 1-SD shift in the change in the voting margin for Bolsonaro. In addition, the severity of COVID-19 did not play a significantly different role across more highly contested municipalities, when accounting for additional municipal observables. This can be seen from Model (2) to Model (6) in Table 5.

Further, once we took into account the additional observables at the municipal level, the state of the economy completely offset the severity of COVID-19 both at the national level and at varying levels of electoral competitiveness. GDP/capita growth at the municipal level emerged as a statistically significant factor at the 5% level, which grew in terms of magnitude at higher levels of contestability. Specifically, a 1-SD increase in GDP/capita growth was associated with a 0.044 of 1-SD increase in the voting margin for Bolsonaro, offsetting the electoral drag on the incumbent from the severity of COVID-19. The growth premium further increased as elections became more contestable, which helped Bolsonaro stay close even if he ultimately lost the elections. This result echoes Sipma and Berning (2021), among others, who also find that support for far-right parties increases as real income grows.

Table 5 offers additional insights on the electability of incumbent populists. In addition to the evidence that good-for-growth populists make themselves more



Table 5 COVID-19 deaths and Bolsonaro's victory margins: OLS estimates with additional municipal covariates

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	+/- 10%	+/- 5%	+/- 2.5%	+/- 1.25%	+/- 0.50%
Deaths/100 citiz.	-1.340*** (0.486)	-0.364 (0.788)	-1.153 (1.066)	-1.524 (1.646)	-1.950 (2.480)	-0.195 (4.691)
GDP/capita growth	0.042** (0.017)	0.056** (0.028)	0.079** (0.040)	0.108* (0.056)	0.152* (0.091)	0.160 (0.163)
Public Exp gr.	0.036* (0.020)	0.042 (0.039)	0.039 (0.049)	0.048 (0.076)	0.008 (0.114)	-0.443* (0.262)
Pop. growth	-0.194 (0.127)	0.151 (0.239)	-0.081 (0.307)	0.083 (0.398)	0.299 (0.529)	2.135* (1.127)
Elec. Mobil.	-0.079*** (0.014)	-0.098*** (0.027)	-0.140*** (0.038)	-0.078 (0.059)	-0.093 (0.072)	0.006 (0.178)
GVA Agric gr.	-0.006 (0.005)	-0.005 (0.010)	-0.016 (0.015)	-0.024 (0.022)	-0.037 (0.034)	-0.005 (0.062)
GVA Ind growth	-0.005 (0.005)	-0.006 (0.008)	-0.005 (0.010)	0.007 (0.014)	0.017 (0.026)	0.028 (0.050)
GVA Serv gr.	-0.018 (0.013)	-0.048** (0.023)	-0.081** (0.034)	-0.098** (0.047)	-0.168** (0.069)	-0.077 (0.125)
Unempl. Rate	0.079*** (0.017)	0.022 (0.043)	-0.023 (0.061)	-0.176** (0.081)	-0.038 (0.133)	0.006 (0.221)
Illiteracy Rate	0.054*** (0.010)	0.144*** (0.027)	0.130*** (0.038)	0.162*** (0.058)	0.333*** (0.088)	0.213 (0.158)
% Higher Edu	-0.124*** (0.021)	-0.053 (0.037)	-0.077 (0.048)	-0.054 (0.072)	0.008 (0.089)	0.132 (0.251)
Gini Coeff.	5.232*** (0.966)	6.054*** (1.761)	7.086*** (2.606)	10.756*** (3.830)	12.656** (5.273)	4.923 (10.530)
% Empl. Agric	0.049*** (0.006)	0.059*** (0.010)	0.048*** (0.014)	0.058*** (0.021)	0.013 (0.031)	0.090 (0.066)
% Empl. Manuf	-0.011 (0.008)	-0.003 (0.014)	-0.009 (0.019)	-0.014 (0.027)	0.017 (0.047)	-0.017 (0.066)
% Public Empl.	0.056*** (0.014)	0.036 (0.027)	0.016 (0.033)	0.003 (0.045)	-0.009 (0.066)	0.001 (0.132)
% Rural Pop.	0.012*** (0.004)	0.025*** (0.008)	0.028** (0.011)	0.011 (0.017)	0.053** (0.023)	0.030 (0.036)
Constant	-8.445*** (1.325)	-13.380*** (2.674)	-17.869*** (4.578)	-11.960*** (3.014)	-13.777*** (3.852)	-11.886** (5.231)
Observations	4873	1669	884	422	202	82
Adjusted R ²	0.706	0.626	0.632	0.623	0.644	0.651

The dependent variable is the change in Bolsonaro's victory margin between 2018 and 2022. A negative change indicates a reduction in the margin (smaller vote share for Bolsonaro in 2022). GDP/capita growth is the average annual real GDP per capita growth, Public Exp growth is the average annual growth in public expenditures and Pop. growth, 2018-22 is the average annual population growth for each municipality between 2018 and 2022. Elec. mobil., 2018-22 is the percentage point change in the

Table 5 (continued)

share of total population that has cast their vote between 2018 and 2022, GVA Agric growth and GVA Ind growth are the average growth rates of the gross value added between 2018 and 2022 in agriculture and industry, respectively. Unempl. Rate is the Unemployment rate of the population aged 18 and over; Illiteracy Rate is the share of illiterate population aged 18 and over; % Higher Edu is the share of population aged 25 and over with complete higher education; Gini Coeff. is the municipal-level Gini coefficient; % Empl. in Agric is the share of employed persons in the agricultural sector; % Empl. in Manuf is the corresponding share in Manufacturing; % Public Empl. is share of employed persons who are public sector workers; % Rural Pop. is the share of total population living in rural areas. Full definitions are given in the online Appendix. The Full Sample in Model (1) contains all municipalities. The rest of the models restrict the sample to municipalities where Bolsonaro had won/lost with a margin of less than 10%, 5%, 2.5%, 1.25% and 0.5% of the votes in 2022, respectively. All models include state fixed effects. Robust standard errors are presented in parentheses. Symbols: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

electable, we could further explore the results for public expenditure growth, electoral mobilization, education, inequality, as well as industry and employment structure. As seen for other elections at the municipal level (Cassette et al. 2013), public expenditures did not make a crucial difference for voting outcomes. At the same time, electoral mobilization grew in importance for the opposition candidate, both nationally and in municipalities where the elections were won within 5–10 percentage points. In those, a 1-SD increase in electoral mobilization was associated with a decrease in Bolsonaro's voting margin by approximately 8–11% of a standard deviation. In turn, this means an incumbent populist may adopt a re-election strategy, where de-mobilizing the opposition voters is part of their tactical arsenal.

Another factor separating the two candidates was education. We measure education in two ways—the share of municipal-level population who either: (1) are illiterate, or (2) have higher education. Illiteracy rate played a more prominent role at higher levels of contestability, whereas it appeared that higher education played a role only at the national level. As expected from previous research on populist electability (Demirci 2023), less educated voters were more likely to help the incumbent populist gain votes. In the Brazilian case, a 1-SD increase in the municipal-level illiteracy was associated with a 0.1-SD boost to Bolsonaro's margin of victory. However, as elections grew more contestable, the magnitude of this illiteracy boost to Bolsonaro's victory grew to between 0.3 and 0.5 of a SD in the explanatory variable, with the effects being significant at 1%. Unlike the higher education penalty, the illiteracy premium is large and electorally significant both nationally and at the local level. From a policy perspective, the incumbent populist needs to engage more with the less educated voters to benefit from such illiteracy premium.

Inequality is another factor that supported the incumbent populist, and more so in more highly contested municipalities. This is not surprising, given the enduring anti-establishment rhetoric of populists after they assume power and formally become part of the 'establishment' (Schwörer 2022). In terms of its magnitude, the inequality premium for Bolsonaro was comparable to, and therefore offset by, the electoral mobilization penalty.

Finally, what helped Bolsonaro deliver a strong performance despite his mismanagement of the COVID-19 crisis was the support he received from voters employed in agriculture and in rural areas. The share of employment in agriculture and the



share of rural population has predominantly come out for the incumbent candidate. This is expected, as those constituencies are typically more attached to government transfers, as explored by Mendes Motta and Hauber (2023) and Pompeia (2020). This result echoes previous studies on public employment and expenditures at local level, which are expected to trigger support for the incumbent candidate, especially in non-consolidated democracies (Lee and Min 2021) as voters there perceive a potential transition of power as a heightened risk of unemployment (Brollo and Troiano 2016).

It is also worth exploring the relative importance of unemployment and public expenditures versus the change in the GDP per capita in determining electoral outcomes. As voter perception of the state of the economy is multi-dimensional (Smyth and Taylor 1992a, 1992b), growth in GDP per capita may be insufficient to capture how voters in Brazil perceived the economy in the 2022 elections. The magnitude and significance of GDP per capita growth relative to unemployment and public expenditures signals that GDP per capita and unemployment had a similar impact on the 2022 electoral outcomes at the national level, with a slightly higher impact of unemployment. This echoes previous results by Mitchell and Willett (2006) for the USA, where voters placed more emphasis on unemployment than personal income, and by Yuksel and Civan (2013) for Türkiye. The impact of unemployment and public expenditures in Brazil, however, was not robustly different at different levels of electoral competition, whereas that of GDP per capita was. In fact, GDP per capita growth gained relative importance at higher levels of electoral competition, implying differences in how voters respond to economic incentives across different electoral settings.

Table 6 presents 2SLS estimates, which reaffirm the insights from Table 5. Specifically, income per capita gains relative importance against crisis management. At the same time, electoral mobilization, education, inequality, employment and demographic structures play a key role in boosting the appeal of the incumbent populist candidate, completely offsetting the role COVID-19 played in electoral outcomes.

Overall, the results above demonstrate the relative decline of electoral relevance of the COVID-19 pandemic in more highly contested municipalities. The severity of COVID-19 may have triggered key support for the opposition candidate and delivered a more highly competitive electoral landscape at the national level. However, COVID-19 was not the key factor for shifting the electoral map against the incumbent populist in Brazil, because voters found other issues more salient. Local issues like GDP per capita growth, inequality and the growing electoral impact of illiteracy may help explain why the incumbent populist in Brazil, like other populist incumbents, has downplayed the national COVID-19 crisis. These results hold after a series of robustness checks, which are presented in the following section.

Robustness Checks

This section implements seven robustness checks on the baseline specification. First, as the trimming reduced the initial sample from 5570 to 4873, we needed to check sensitivity of the results to the trimming procedure. To this end, we re-run the



Table 6 COVID-19 deaths and Bolsonaro's victory margins: 2SLS estimates with additional municipal covariates

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	+/- 10%	+/- 5%	+/- 2.5%	+/- 1.25%	+/- 0.50%
Deaths /100 citiz.	-0.428 (1.044)	2.202 (1.986)	1.611 (1.964)	-1.818 (1.856)	-4.445* (2.274)	-4.842 (3.739)
GDP/capita growth	0.042** (0.017)	0.057** (0.028)	0.085** (0.039)	0.108** (0.054)	0.156* (0.083)	0.173 (0.131)
Public Exp gr.	0.036* (0.020)	0.044 (0.038)	0.039 (0.048)	0.047 (0.072)	0.022 (0.107)	-0.365* (0.216)
Pop. growth	-0.146 (0.136)	0.287 (0.253)	0.065 (0.317)	0.073 (0.390)	0.232 (0.486)	2.193** (0.928)
Elec. mobil.	-0.079*** (0.014)	-0.100*** (0.027)	-0.138*** (0.037)	-0.078 (0.057)	-0.095 (0.065)	0.015 (0.134)
GVA Agric gr.	-0.006 (0.005)	-0.004 (0.010)	-0.016 (0.014)	-0.024 (0.022)	-0.036 (0.032)	-0.010 (0.050)
GVA Ind growth	-0.006 (0.005)	-0.007 (0.008)	-0.007 (0.010)	0.007 (0.014)	0.017 (0.024)	0.025 (0.040)
GVA Serv gr.	-0.018 (0.013)	-0.050** (0.023)	-0.085*** (0.033)	-0.097** (0.045)	-0.169*** (0.063)	-0.083 (0.099)
Unempl. Rate	0.081*** (0.017)	0.023 (0.043)	-0.025 (0.060)	-0.176** (0.078)	-0.044 (0.124)	0.005 (0.180)
Illiteracy Rate	0.055*** (0.010)	0.144*** (0.026)	0.129*** (0.037)	0.162*** (0.055)	0.338*** (0.082)	0.226* (0.126)
% Higher Edu	-0.127*** (0.021)	-0.062* (0.037)	-0.085* (0.046)	-0.053 (0.070)	0.015 (0.083)	0.155 (0.198)
Gini Coeff.	5.272*** (0.965)	5.975*** (1.731)	7.017*** (2.534)	10.749*** (3.680)	12.354** (4.888)	5.208 (8.319)
% Empl. Agric.	0.050*** (0.006)	0.062*** (0.010)	0.051*** (0.014)	0.058*** (0.021)	0.006 (0.029)	0.072 (0.053)
% Empl. Manuf.	-0.010 (0.008)	-0.004 (0.014)	-0.009 (0.019)	-0.014 (0.026)	0.017 (0.043)	-0.016 (0.055)
% Public Empl.	0.058*** (0.014)	0.044 (0.027)	0.021 (0.032)	0.002 (0.043)	-0.005 (0.061)	0.026 (0.102)
% Rural Pop.	0.013*** (0.004)	0.028*** (0.008)	0.031*** (0.011)	0.011 (0.017)	0.052** (0.022)	0.032 (0.030)
Observations	4872	1668	884	422	202	82
Adjusted R ²	0.211	0.239	0.224	0.249	0.261	0.259
KI'n-Paap	16.651	13.939	40.012	61.928	47.610	16.595
Hansen J	0.308	0.199	0.332	0.807	0.374	0.354

The dependent variable is the change in Bolsonaro's victory margin between 2018 and 2022. A negative change indicates a reduction in the margin (smaller vote share for Bolsonaro in 2022). GDP/capita growth is the average annual real GDP per capita growth, Public Exp growth is the average annual growth in public expenditures and Pop. growth, 2018-22 is the average annual population growth for each municipality between 2018 and 2022. Elec. mobil., 2018-22 is the percentage point change in the

Table 6 (continued)

share of total population that has cast their vote between 2018 and 2022, GVA Agric growth and GVA Ind growth are the average growth rates of the gross value added between 2018 and 2022 in agriculture, industry and services, respectively. Full definitions are given in the online Appendix. The Full Sample in Model (1) contains all municipalities. The rest of the models restrict the sample to municipalities where Bolsonaro had won/lost with a margin of less than 10%, 5%, 2.5%, 1.25% and 0.5% of the votes in 2022, respectively. All models include state fixed effects. Robust standard errors are presented in parentheses. Kl'n-Paap reports the Kleibergen-Paap (2006) *rk* Wald F test for weak instruments. Hansen J is the p-value from the Hansen J overidentification test. Symbols: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

models using the entire sample. Second, we considered the severity of COVID-19 based on the number of confirmed COVID-19 cases instead of the mortality from the disease. The third one used the 2018 margins of victory for Bolsonaro to create the contestability margins, which had been based on the 2022 election outcomes. The fourth one included an explicit measure of contestability. The fifth robustness check used a different set of measures of local inequality. The final two robustness checks dealt with the risk of including bad controls and omitting relevant variables at the municipal level. The results are discussed below and reproducible using the supplementary material in the online Appendix.

Sensitivity to Outliers

To run the estimations presented in the previous section, we trimmed 1% of data from each tail of the distributions of the following variables: the change in the margin of victory between 2018 and 2022, the number of deaths and cases per 100 people, GDP/capita growth, the change in electoral mobilization, and the growth of value added in agriculture, manufacturing and services, respectively. This has significantly reduced the sample to 4878 municipalities from the original sample of 5570. In this section, we have re-produced the 4 tables using the entire sample of 5570 municipalities. Although some differences were noticeable, particularly when additional municipal-level observables were included, the key political trade-off discussed above still emerged. Since this carries over the main message of the paper, we consider the main result in this work to be robust to outliers.

The Severity of COVID-19

This robustness check follows the baseline specification run with the number of COVID-19 cases instead of the number of COVID-19 deaths. The rest of the model remained unchanged. We find that COVID-19 cases are indeed statistically significant, much like COVID-19 deaths. However, this effect does not extend to the most contested municipalities in the country where the margin of victory was less than 0.5%. The other estimates, including the political trade-off between economic and healthcare crisis management, behaved much like in the original specification.



The Influence of 2018 Voting Patterns

In the baseline results, contestability is based on the 2022 electoral margins for the incumbent candidate. This check uses the 2018 margins of victory for Bolsonaro to gauge the levels of contestability. We find that COVID-19 deaths act similarly to our original results, yet to an admittedly lower magnitude and statistical significance, which strengthens the evidence of the political trade-off for the incumbent candidate discussed above. The results broadly extend to the other explanatory variables as well.

The Direct Role of Contestability

The baseline specification did not explicitly include a measure of contestability. This has been changed in the following robustness check where we added a direct measure of contestability based on Bolsonaro's margin of victory in either 2018 or 2022. Once again, the key messages were broadly unchanged.

The Definition of Inequality

The baseline specification included a standard measure of municipal-level inequality—the Gini coefficient. However, the advantage to having census data from 2010 is that we could check if the main results depended on this definition. Instead of Gini, we re-run the main estimations using three alternatives: Top 10-to-Bottom 40, Top 20-to-Bottom 40, as well as the share of extreme poverty at the municipal level. As before, the key messages were broadly unchanged.

Bad Controls

Recall that the change in electoral turnout between the 2018 and 2022 elections was used as a control variable in the baseline OLS and 2SLS models. However, voter turnout has been shown to correlate with severity of COVID-19 and associated policies (Giommoni and Loumeau 2022; Picchio and Santolini 2022). Therefore, it could also be a potential outcome variable, triggering a 'bad control' problem (Cinelli et al. 2024). Therefore, we would like to know if the results change if electoral mobilization is removed from the right-hand side of the regressions. Excluding the potentially bad control triggers negligible change in reported estimates, while the statistical significance across all estimates is retained.

Additional State-Level Observables

Our final robustness check aims to mitigate potential omitted variable bias from the baseline estimates. Several municipal-level observables were included in the main model, but the level of income support and debt relief were initially not among them. To remedy this, we used the Hale et al. (2021) data at the sub-national level, which disaggregates containment measures and government support for all Brazilian states. However, neither the Brazilian national statistical office nor Hale et al. (2021)



Table 7 COVID-19 deaths and Bolsonaro's victory margins: Baseline OLS estimates with state-level income support

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	+/- 10%	+/- 5%	+/- 2.5%	+/- 1.25%	+/- 0.50%
Deaths/100 citiz.	-17.415*** (0.542)	-9.191*** (1.076)	-7.852*** (1.446)	-7.285*** (2.119)	-8.331*** (3.094)	-13.666*** (4.491)
GDP/capita growth	0.154*** (0.022)	0.358*** (0.038)	0.435*** (0.051)	0.427*** (0.071)	0.504*** (0.098)	0.473*** (0.115)
Public Exp gr.	0.124*** (0.027)	-0.036 (0.052)	-0.034 (0.069)	-0.146 (0.099)	-0.187 (0.155)	-0.160 (0.292)
Pop. growth	-2.175*** (0.169)	-1.830*** (0.309)	-1.856*** (0.412)	-1.425** (0.610)	-0.729 (0.864)	0.872 (1.033)
Elec. mobil.	-0.212*** (0.020)	-0.184*** (0.042)	-0.242*** (0.053)	-0.098 (0.068)	-0.073 (0.110)	-0.133 (0.166)
GVA Agric gr.	-0.020*** (0.007)	-0.090*** (0.013)	-0.120*** (0.018)	-0.115*** (0.027)	-0.107** (0.042)	-0.104* (0.054)
GVA Ind gr.	-0.028*** (0.006)	-0.044*** (0.011)	-0.055*** (0.014)	-0.034 (0.021)	-0.045 (0.032)	-0.047 (0.051)
GVA Serv gr.	-0.107*** (0.016)	-0.264*** (0.033)	-0.302*** (0.046)	-0.297*** (0.062)	-0.369*** (0.077)	-0.142 (0.104)
Income support	10.160*** (0.525)	6.766*** (1.567)	5.051** (2.177)	-1.511 (3.053)	-4.467 (4.540)	-7.995 (6.842)
Constant	-4.836*** (0.498)	-5.525*** (1.132)	-4.029*** (1.555)	-0.122 (2.212)	2.177 (3.310)	7.145 (4.874)
Observations	4878	1671	884	422	202	82
Adjusted R ²	0.296	0.176	0.201	0.165	0.185	0.170

The dependent variable is the change in Bolsonaro's victory margin between 2018 and 2022. A negative change indicates a reduction in the margin (smaller vote share for Bolsonaro in 2022). GDP/capita growth is the average annual real GDP per capita growth, Public Exp growth is the average annual growth in public expenditures and Pop. growth, 2018-22 is the average annual population growth for each municipality between 2018 and 2022. Elec. mobil., 2018-22 is the percentage point change in the share of total population that has cast their vote between 2018 and 2022, GVA Agric growth and GVA Ind growth are the average growth rates of the gross value added between 2018 and 2022 in agriculture, industry and services, respectively. Full definitions are given in the online Appendix. The Full Sample in Model (1) contains all municipalities. The rest of the models restrict the sample to municipalities where Bolsonaro had won/lost with a margin of less than 10%, 5%, 2.5%, 1.25% and 0.5% of the votes in 2022, respectively. All models include the state-level income support, which is perfectly collinear with and replaces state fixed effects. Robust standard errors are presented in parentheses. Symbols: *p < 0.10, **p < 0.05, ***p < 0.01.

report these at lower granularity, e.g., at the municipal level. We therefore resorted to the best alternative—using state-level income support and debt relief. To arrive at the measures that could be electorally relevant, we averaged each indicator over time up to, and including the day of the runoff presidential elections, 30 October 2022.

This procedure created a proxy for income support, debt relief and overall economic support at the state level before the election results were called.



Table 8 COVID-19 deaths and Bolsonaro's victory margins: Baseline OLS estimates with state-level debt relief

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	+/- 10%	+/- 5%	+/- 2.5%	+/- 1.25%	+/- 0.50%
Deaths/100 cit.	-19.945*** (0.539)	-9.405*** (1.091)	-7.878*** (1.474)	-7.288*** (2.167)	-7.884** (3.188)	-13.303*** (4.756)
GDP/capita growth	0.147*** (0.023)	0.366*** (0.039)	0.443*** (0.051)	0.423*** (0.073)	0.512*** (0.099)	0.456*** (0.117)
Public Exp gr.	0.104*** (0.028)	-0.054 (0.053)	-0.050 (0.070)	-0.136 (0.099)	-0.183 (0.150)	-0.054 (0.269)
Pop. growth	-1.763*** (0.169)	-1.367*** (0.290)	-1.493*** (0.389)	-1.529*** (0.571)	-1.035 (0.800)	0.007 (0.917)
Elec. mobil.	-0.181*** (0.020)	-0.130*** (0.037)	-0.201*** (0.047)	-0.107 (0.067)	-0.106 (0.119)	-0.209 (0.171)
GVA Agric gr.	-0.022*** (0.007)	-0.091*** (0.014)	-0.124*** (0.019)	-0.114*** (0.027)	-0.108** (0.042)	-0.101* (0.056)
GVA Ind gr.	-0.010 (0.006)	-0.038*** (0.012)	-0.052*** (0.015)	-0.034 (0.021)	-0.049 (0.032)	-0.052 (0.052)
GVA Serv gr.	-0.139*** (0.017)	-0.289*** (0.031)	-0.316*** (0.044)	-0.292*** (0.062)	-0.372*** (0.081)	-0.127 (0.110)
Debt relief	0.751*** (0.208)	0.845*** (0.309)	0.565 (0.444)	-0.085 (0.670)	-0.768 (0.991)	-0.430 (1.806)
Constant	3.595*** (0.220)	-0.851* (0.489)	-0.545 (0.605)	-1.218 (0.901)	-0.956 (1.311)	1.386 (1.629)
Observations	4878	1671	884	422	202	82
Adjusted R ²	0.247	0.165	0.195	0.165	0.182	0.148

The dependent variable is the change in Bolsonaro's victory margin between 2018 and 2022. A negative change indicates a reduction in the margin (smaller vote share for Bolsonaro in 2022). GDP/capita growth is the average annual real GDP per capita growth, Public Exp growth is the average annual growth in public expenditures and Pop. growth, 2018-22 is the average annual population growth for each municipality between 2018 and 2022. Elec. mobil., 2018-22 is the percentage point change in the share of total population that has cast their vote between 2018 and 2022, GVA Agric growth and GVA Ind growth are the average growth rates of the gross value added between 2018 and 2022 in agriculture, industry and services, respectively. Full definitions are given in the online Appendix. The Full Sample in Model (1) contains all municipalities. The rest of the models restrict the sample to municipalities where Bolsonaro had won/lost with a margin of less than 10%, 5%, 2.5%, 1.25% and 0.5% of the votes in 2022, respectively. All models include the state-level measures of debt relief, which is perfectly collinear with and replaces state fixed effects. Robust standard errors are presented in parentheses. Symbols: *p < 0.10, **p < 0.05, ***p < 0.01.

However, it also meant that the state-level observables became collinear with the state fixed effects which were included in the baseline estimations. Therefore, estimating the model with the newly included state-level observables mandated removing the state fixed effects. The newly produced estimates are reported in Tables 7, 8, and 9, and each table corresponds to a specific state-level support



Table 9 COVID-19 deaths and Bolsonaro's victory margins: Baseline OLS estimates with state-level overall economic support

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	+/- 10%	+/- 5%	+/- 2.5%	+/- 1.25%	+/- 0.50%
Deaths/100 citiz.	-19.962*** (0.532)	-9.417*** (1.095)	-7.813*** (1.481)	-7.064*** (2.181)	-7.588** (3.186)	-12.649** (4.843)
GDP/capita growth	0.134*** (0.023)	0.366*** (0.039)	0.448*** (0.051)	0.432*** (0.073)	0.524*** (0.099)	0.474*** (0.120)
Public Exp gr.	0.115*** (0.028)	-0.053 (0.053)	-0.054 (0.070)	-0.147 (0.100)	-0.205 (0.152)	-0.087 (0.279)
Pop. growth	-1.812*** (0.171)	-1.411*** (0.288)	-1.517*** (0.388)	-1.510*** (0.572)	-0.997 (0.801)	0.013 (0.881)
Elec. mobil.	-0.179*** (0.020)	-0.135*** (0.037)	-0.207*** (0.047)	-0.110* (0.066)	-0.108 (0.117)	-0.220 (0.168)
GVA Agric gr.	-0.022*** (0.007)	-0.091*** (0.014)	-0.124*** (0.019)	-0.115*** (0.027)	-0.110*** (0.042)	-0.106* (0.056)
GVA Ind gr.	-0.008 (0.006)	-0.039*** (0.012)	-0.053*** (0.015)	-0.036* (0.021)	-0.052 (0.032)	-0.059 (0.053)
GVA Serv gr.	-0.126*** (0.017)	-0.288*** (0.031)	-0.319*** (0.044)	-0.298*** (0.062)	-0.379*** (0.081)	-0.135 (0.107)
Economic support	0.055*** (0.009)	0.030** (0.012)	0.014 (0.017)	-0.017 (0.026)	-0.048 (0.035)	-0.046 (0.063)
Constant	2.670*** (0.277)	-1.184** (0.538)	-0.647 (0.664)	-0.933 (0.964)	-0.227 (1.403)	2.157 (1.886)
Observations	4878	1671	884	422	202	82
Adjusted R ²	0.253	0.165	0.194	0.166	0.189	0.156

The dependent variable is the change in Bolsonaro's victory margin between 2018 and 2022. A negative change indicates a reduction in the margin (smaller vote share for Bolsonaro in 2022). GDP/capita growth is the average annual real GDP per capita growth, Public Exp growth is the average annual growth in public expenditures and Pop. growth, 2018-22 is the average annual population growth for each municipality between 2018 and 2022. Elec. mobil., 2018-22 is the percentage point change in the share of total population that has cast their vote between 2018 and 2022, GVA Agric growth and GVA Ind growth are the average growth rates of the gross value added between 2018 and 2022 in agriculture, industry and services, respectively. Full definitions are given in the online Appendix. The Full Sample in Model (1) contains all municipalities. The rest of the models restrict the sample to municipalities where Bolsonaro had won/lost with a margin of less than 10%, 5%, 2.5%, 1.25% and 0.5% of the votes in 2022, respectively. All models include an overall state-level economic support index, which is perfectly collinear with and replaces state fixed effects. Robust standard errors are presented in parentheses. Symbols: *p < 0.10, **p < 0.05, ***p < 0.01.

variable: income support, debt relief, and overall economic support as defined in Hale et al. (2021), respectively.

The estimates of the state-level support have the intuitive positive sign. This means that all measures to mitigate financial pressures on households had a small, but significant, association with Bolsonaro's electoral chances. Any



effect, however, was insufficiently strong to undermine the main results, which remained broadly unchanged. What is perhaps worth exploring further is the notion that economic support and debt relief lost both their relative significance to the healthcare parameters and their absolute significance for more contested municipalities. In turn, this could reveal a potentially winning electoral strategy for the incumbent populists: If their elections are won at the national level—for example, by counting the total number of votes in the general election—targeting economic support at the more contested municipalities may make little sense. Instead, broad-based economic support measures need to be run at the national level where they seem to have the highest impact.

These checks strengthen our confidence that our results are robust to sensible changes in the underlying methodology. The rest of the conclusions are presented below.

Conclusion

The severity of COVID-19 caused significant damage to the electability of an incumbent populist, Jair Bolsonaro. His electoral outcomes were significantly lower in 2022 than before the pandemic, and both our OLS and 2SLS estimates attribute this electoral damage to the severity of COVID-19 measured by either mortality or number of confirmed cases. We also find that, in absolute terms, the effect was stronger in more contested municipalities.

We also find an electoral trade-off between the economic and healthcare costs of the pandemic, exhibited differently at various margins of victory: While the average voter at the national level may have been more interested in the healthcare costs of the pandemic, their electoral focus shifted to the economy in more contested municipalities. This is a novel result on the electability of incumbent populists, informing changing perceptions of populist competence at varying levels of electoral competition. This helps explain their electoral tactics of downplaying failures in crisis management and emphasizing the state of the economy. If their electoral success depends on a few highly contested regions, exploiting this political trade-off could form part of an incumbent populist's re-election strategy.

More broadly, our results add evidence in the nexus of crises, electoral outcomes, and populist governance in progressively competitive regions. As the costs of incumbent populism are high (Dornbusch and Edwards 1990; Funke et al. 2023), the costs of ignoring their re-election strategies could prove equally damaging.

Declarations

Conflict of interest None.

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