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Working Paper

#EleNã: Economic crisis, the political gender gap, and the election of Bolsonaro

IAI Discussion Papers, No. 242

Provided in Cooperation with:

Ibero-America Institute for Economic Research, University of Goettingen

Suggested Citation: Barros, Laura; Santos Silva, Manuel (2019) : #EleNã: Economic crisis, the political gender gap, and the election of Bolsonaro, IAI Discussion Papers, No. 242, Georg-August-Universität Göttingen, Ibero-America Institute for Economic Research (IAI), Göttingen

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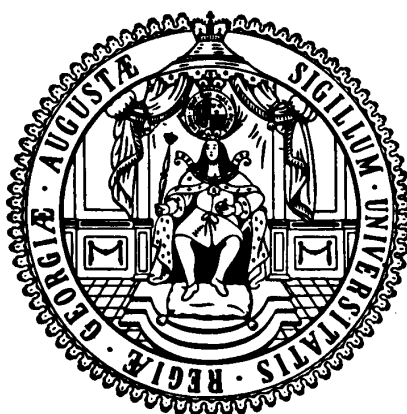
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Nr. 242

**#EleNãO: Economic crisis, the political
gender gap, and the election of Bolsonaro**

Laura Barros, Manuel Santos Silva

August 2019

#EleNãO: Economic crisis, the political gender gap, and the election of Bolsonaro

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This version: August 9, 2019.

Abstract

After more than one decade of sustained economic growth, accompanied by falling poverty and inequality, Brazil has been hit by an economic recession starting in 2014. This paper investigates the consequences of this labor market shock for the victory of far-right Jair Bolsonaro in the 2018 presidential election. Using a shift-share approach and exploring the differential effects of the recession by gender and race, we show that heterogeneity in exposure to the labor demand shock by the different groups is a key factor explaining the victory of Bolsonaro. Our results show that male-specific labor market shocks increase support for Bolsonaro, while female-specific shocks have the opposite effect. Interestingly, we do not find any effect by race. We hypothesize that, once facing economic insecurities, men feel more compelled to vote for a figure that exacerbates masculine stereotypes, as a way of compensating for the loss in economic status. Women, on the other hand, when confronted with economic shocks and the prospect of Bolsonaro's election, respond by rejecting his political agenda in favor of a more pro-social platform.

JEL-Classification: D72, J16, J23, P16, R23.

Keywords: economic shocks, populism, gender, voter participation

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We are grateful to Zohal Hessami, Lisa Höckel, Krisztina Kis-Katos, Stephan Klasen, Samuel Siewers, Bruno Witzel de Souza, and participants at the Globalization and Development (GlaD) workshop at the University of Goettingen for comments and suggestions.

1 Introduction

In recent years, there is a surge in populist (Trump, ‘Brexit’), authoritarian (Duterte, Erdogan), and far-right movements (Front National, Alternative für Deutschland, Lega Nord), in advanced and emerging economies.¹ In October 2018, Brazil joined this wave by electing far-right Jair Bolsonaro as president. This outcome comes in the aftermath of a severe economic crisis that, from 2014 onward, interrupted more than one decade of sustained economic growth, accompanied by falling poverty and inequality. Although political extremism relates to a wide range of context-specific factors, such as immigration, insecurity, corruption, social media, and erosion of political institutions, all episodes seem to be linked by common economic roots. As discussed in the political economy literature, economic events are important determinants of voting behavior (Fair, 1978), and crises often lead to increased support for nativist, populist or anti-establishment platforms (Norris and Inglehart, 2016). While identifying the determinants of political extremism is important in its own right, understanding the role of economic conditions can generate relevant policy implications, such as the function of social protection and economic assistance in deterring political polarization (Dippel *et al.*, 2015; Che *et al.*, 2016; Colantone and Stanig, 2018).

Empirically, a couple of recent papers have attempted to investigate the effects of economic shocks on electoral outcomes. Using a local labor market approach, Autor *et al.* (2017) show that commuting zones in the US more exposed to Chinese import competition experience an increase in support for candidates in the extremes of the political spectrum. In a similar vein, Dippel *et al.* (2015) find that trade integration with China and Eastern Europe explains the rise in vote share for far-right parties in Germany. An increase in import competition strengthens far-right parties, whereas a rise in export opportunities has the opposite effect. Colantone and Stanig (2018) show that the pattern holds, more broadly,

¹In its 2019 annual report, the Varieties of Democracy (V-DEM) project estimates that “almost one-third of the world’s population lives in countries undergoing autocratization” (V-DEM, 2019, p. 15). The report identifies three main challenges to democracy worldwide: (1) “government manipulation of media, civil society, rule of law, and elections”; (2) the rise of “toxic polarization”; and (3) “the spread of disinformation” online (V-DEM, 2019, p. 5).

for Western European countries: in response to globalization and import competition, voters shift towards nationalist and isolationist parties. The authors argue that, for the so-called ‘losers of globalization’, protectionism and nationalism are appealing responses to the challenges imposed by trade integration, especially when governments struggle to implement redistribution and compensation policies.

In addition to the rise in political extremism, economic conditions also appear to foster skepticism in political institutions and lower social trust. This topic has been particularly salient in the European public debate, in the last years. In this respect, [Algan *et al.* \(2017\)](#) find evidence that the rise in unemployment following the Great Recession increased voting for anti-establishment parties and eroded trust in European institutions. Similarly, [Fetzer \(forthcoming\)](#) investigates the role of austerity reforms in the UK in explaining the Leave’s vote share in Brexit’s referendum in 2016. The author estimates that, in the absence of the austerity reforms starting in 2010, Remain would have won the referendum.

Although being a current topic of interest, the relationship between economic crisis and political polarization is not a recent phenomenon. [De Bromhead *et al.* \(2013\)](#) study the role of the Great Depression in the rise of far-right parties in the 1920s and 1930s. Across a sample of 28 countries, cumulative growth performance was an important factor explaining support for the extreme-right in the interwar period. In line with these results, [Jackman and Volpert \(1996\)](#) also show that, among other factors, high unemployment rates were associated with far-right support in Western Europe, between 1970 and 1990.

When thinking about populism and political extremism, it is important to distinguish the role of demand factors—i.e., those related to voter’s support—from the role of supply factors—i.e., those related to the extremist political actors. From the demand side, [Guiso *et al.* \(2017\)](#) argues that support for populism arises in contexts that combine high economic insecurity with low levels of confidence for the establishment. During economic crises, competition for scarce resources tends to activate division and animosity between social groups, along perceived racial, ethnic, or class axes ([Alesina *et al.*, 1999](#); [Hutchings and Valentino, 2004](#); [Habyarimana *et al.*, 2007](#)). Higher demand for populist politics is usually associated with lower demand for establishment parties ([Fetzer, forthcoming](#)). In Europe,

lower voter turnout of those disillusioned with traditional parties plays a pivotal role in the recent thriving of populist parties (Guiso *et al.*, 2017).

From the supply side, it is precisely the skepticism about traditional political elites that is explored by populist parties, when targeting voters. Also related to the topic of politician’s behavior and political discourses, Glaeser *et al.* (2005) emphasize the role of extremism as a strategic behavior of political parties to maximize support. The main reasoning for that, according to the authors, is the existence of information asymmetries between the group supporting a politician and the group supporting his opponent. For instance, because the politician’s supporters are more likely to be aware of his extreme views than his opponent’s, the positive effect of extreme messages for supporters is higher than the negative effect for non-supporters.

One aspect that differentiates the victory of Jair Bolsonaro, in the Brazilian presidential election of 2018, from other populist and far-right movements is that great part of his extreme views concerned gender issues and often reflected his misogynous beliefs. What is puzzling in this respect is that women corresponded to 52% of the Brazilian electorate in 2018, so understanding the reasons of his victory in spite of his hostility towards such an important demographic is not straightforward. By investigating the economic context that preceded the Brazilian election, we intend to shed light on how gender may help explaining the victory of Bolsonaro, both from the demand side—associated with social identity—as from the supply side—associated with strategic politician behavior.

Starting in late 2014, the Brazilian economy has been hit by a severe economic crisis. The crisis arose from a complex combination of factors, including a bust in commodity prices, policy mismanagement, and widespread political and economic uncertainty in the wake of the *Lava Jato* (Car Wash) corruption scandal (Mello and Spektor, 2018; Spilimbergo and Srinivasan, 2018; Hunter and Power, 2019). Using a shift-share approach for causal identification and exploring the differential effects of the 2014–17 recession by gender and race, we find that, in regions where men experience a larger economic shock, there is an increase the share of votes for Bolsonaro. In contrast, in regions where women experience larger shocks, his vote share is relatively lower. Moreover, the shock-responses

to abstention also vary by gender. Where women are hit harder by the crisis, abstention rates decrease, relative to the previous election. (We find null abstention effects for the male shock.) In the 2nd round of the election, the female shock also reduces the average share of invalid votes (null/blank) in a local labor market.

Overall, we find that female-specific labor market shocks reduce support for Bolsonaro and decrease abstention and null/blank votes. Male-specific shocks, on the other hand, increase support for Bolsonaro. We find the opposite effects for the percentage point change in votes for the leftwing Workers' Party (Partido dos Trabalhadores, henceforth PT) between the 2018 and 2014 elections. We also show that these findings are robust to several alternative specifications and additional control variables. Interestingly, we find that race-specific shocks do not significantly affect support for any of the two main candidates.

We hypothesize that, once facing economic insecurity, men might feel more compelled to vote for a figure that exacerbates masculine stereotypes, as a way of compensating for the loss of economic status. This would be consistent with the notion that employment and relative earnings are so central for male identity that, once threatened, men often respond by exaggerating their masculinity (Bertrand *et al.*, 2015; Cheryan *et al.*, 2015). In an article published in The Washington Post, Eric Knowles and Sarah DiMuccio document a strong correlation between internet searches on topics that reflect men's insecurities about their own manhood and vote shares for Donald Trump in the 2016 US presidential election, which give support to the 'fragile masculinity hypothesis'.² Additionally, Ballard-Rosa *et al.* (2019) show that, when hit by economic shocks, traditionally dominant groups might shift toward more authoritarian values. A related literature on intimate partner violence (IPV) has also shown that, in some contexts, but not in others, males often become more violent once their partners experience an increase in income, meaning that aggressiveness would be associated with the loss of relative economic status (Koenig *et al.*, 2003; Weitzman, 2014;

²Eric Knowles and Sarah DiMuccio's "How Donald Trump appeals to men secretly insecure about their manhood" appeared on The Washington Post's Monkey Cage section on November 29, 2018. Available at https://www.washingtonpost.com/news/monkey-cage/wp/2018/11/29/how-donald-trump-appeals-to-men-secretly-insecure-about-their-manhood/?utm_term=.c5354f787b42 [accessed 22.07.2019].

Bulte and Lensink, 2019).³ This is known in household bargaining models as the male backlash theory (Bloch and Rao, 2002; Eswaran and Malhotra, 2011; Luke and Munshi, 2011).

While the voting response of males to the economic crisis can be associated to existing norms of masculinity, the female response will likely combine multiple factors. In addition to the repulse for an openly misogynous candidate, women’s voting behavior may reflect different preferences for redistribution and social protection in the context of the Brazilian economic recession. For the US, Edlund and Pande (2002) show that higher poverty rates among females, resulting from the declining trend in marriages, has created a gender gap in political preferences, with higher female support for the Democrats, and higher male support for the Republican party.⁴ Empirical evidence on the extension of franchise to women is consistent with the view that, on average, women are to the left of the political spectrum, relative to men (e.g., Lott and Kenny, 1999; Aidt and Dallal, 2008; Miller, 2008). Interestingly, in the case of Brazil, women’s political behavior is reflected not only in the electoral results, but also in the demonstrations preceding the election. The #EleNÃO (Not Him) movement, which was a widespread protest against Jair Bolsonaro, consisted in the biggest political manifestation organized by women in Brazilian history.

We argue that our results are unlikely to be purely driven by women’s leftwing leanings relative to men. In our view, two pieces of evidence support this argument. First, we do not find effects by race. If the shock-response is entirely driven by disadvantaged groups rejecting far-right Bolsonaro, we would expect the effects of the female and nonwhite shocks to point in the same direction. In fact, if anything, the anti-Bolsonaro reaction to the nonwhite shock should be even stronger, on purely economic grounds. In Brazil, wage gaps between whites and nonwhites are an order of magnitude larger than the gender wage gap (Salardi, 2012). This is partially explained by a higher, and more persistent, level of occupation segregation by race than by gender (Salardi, 2016). Second, descriptive evidence suggests that the large political gender gap is specific to the 2018 election. On

³Results from randomized control trials on cash transfers for women are mixed. Hidrobo *et al.* (2016) find a reduction in IPV in Ecuador, whereas Roy *et al.* (forthcoming) find null effects in Bangladesh.

⁴See also Edlund *et al.* (2005) for a similar argument using evidence from Europe.

the eve of the 2014 runoff election, voting poll data reveal that the gender gap in votes between Dilma Rousseff, the leftwing and *female* candidate, and Aécio Neves, center-right and *male*, was small: 44% of men preferred Aécio *versus* 42% of women. A comparable poll, on the even the 2018 runoff, shows a staggering gender gap: 54% of men would vote for Bolsonaro *versus* 41% of women (see Table 1, in section 2).

To the best of our knowledge, this is the first paper focusing on the differential responses by gender and race to economic shocks and its consequences for the election of a far-right president. Autor *et al.* (2017) estimate the effect of gender-specific components of the ‘China shock’ for the 2002 and 2010 US congressional elections. They find that trade exposure to male-intensive industries builds up support for conservative politicians. The female-component of trade exposure is statistically insignificant, albeit negative in sign. Differently from us, Autor *et al.* (2017) do not explore race-specific shocks due to sample size limitations. Furthermore, whereas their findings are best understood as medium to long-run effects of import competition from China—a secular and ongoing process—, we, on the other hand, focus on a severe, well-defined, economic crisis (2014–17) that happens immediately before the 2018 presidential election.

As for the limitations of the paper, there are two main shortcomings. First, as our main electoral outcomes are aggregated at the regional level, we cannot pin down whether the gender and race specific shocks affected voting behavior of the respective population group. Second, since our identification strategy relies on variation across regions, we cannot explain average shifts in support for Bolsonaro, but only differential outcomes across space. Nevertheless, we benchmark the magnitude of the gender-specific shocks of our preferred specifications against Bolsonaro’s victory margin. Simple counterfactual exercises predict that if the male shock had, on average, occurred at its maximum observed value, Bolsonaro would have been narrowly elected already in the 1st round of the election. In contrast, if the female shock were, on average, above the 90th percentile of the *male* shock distribution, Bolsonaro would have lost the 2nd round to Fernando Haddad (PT).

The paper relates to several strands of research. First, we speak directly to the literature investigating the role of economic shocks on the rise of populist and extremist

politicians (Dippel *et al.*, 2015; Che *et al.*, 2016; Autor *et al.*, 2017; Colantone and Stanig, 2018; Fetzer, *forthcoming*). Second, we relate to the strand of research linking political economy and gender (Edlund and Pande, 2002; Edlund *et al.*, 2005; Doepke *et al.*, 2012; Brollo and Troiano, 2016). More broadly, we add to the growing body of evidence on differential gender effects of economic shocks (Kis-Katos *et al.*, 2018; Anukriti and Kumler, 2019; Autor *et al.*, *forthcoming*). Fourth, we build on studies exploring the economics of social identity (Akerlof and Kranton, 2000, 2010; Bertrand *et al.*, 2015; Bursztyn *et al.*, 2017; Ballard-Rosa *et al.*, 2019). And, finally, we contribute to the empirical literature estimating the socio-economic consequences of labor market shocks in Brazil. The vast majority of studies for Brazil have used the trade liberalization process of 1988–1995 as a natural experiment, in order to estimate local labor market effects on, *inter alia*, wages and employment (Kovak, 2013; Dix-Carneiro and Kovak, 2017; Gaddis and Pieters, 2017), crime (Dix-Carneiro *et al.*, 2018), religion (Costa *et al.*, 2018), fertility (Braga, 2018), and discrimination (Hirata and Soares, 2016). In contrast to that literature, we provide evidence on a much more recent, and yet unexplored, economic shock, the 2014–17 recession, and link it to a tectonic shift in the country’s political environment—Jair Bolsonaro’s election—, whose consequences are likely to be felt for many years to come.

The next section presents the political and economic context preceding the Brazilian presidential election of 2018. Section 3 discusses the empirical strategy. In section 4, we presents the main results and, in section 5, discuss underlying mechanisms and assess robustness. Section 6 concludes.

2 Brazil’s 2018 presidential election: economic and political context

In 2002, Luiz Inácio Lula da Silva was elected president of Brazil, starting a 14-year rule for the leftwing PT. After Lula’s two consecutive terms (2002–06, 2006–10)—the maximum allowed by the Constitution—, Dilma Rousseff, his former minister and chief-of-staff, won

the 2010 and 2014 elections. The period 2002–2013 was marked by sustained economic growth (Figure 1), large increase in social spending (e.g, Hall, 2006), and rapidly falling poverty and inequality (e.g., Alvarez *et al.*, 2018).

However, starting in 2014, the Brazilian economy has been hit by a severe economic crisis (Figure 1), which quickly morphed into social and political turmoil, culminating in Dilma’s impeachment, in August 2016. The onset of the economic slowdown, in late 2014, resulted from a combination of several factors (Spilimbergo and Srinivasan, 2018). Commodity prices fell sharply, which, together with macroeconomic mismanagement, led to a severe fiscal crisis. The same year marks the beginning of operation *Lava Jato* (Car Wash), which quickly unfolded to become the largest corruption scandal, in terms of misappropriated funds, ever uncovered in Brazil (Mello and Spektor, 2018; Pinotti, 2018; Hunter and Power, 2019).⁵ The criminal scheme involved a cartel of construction companies that, in collusion with public officials and politicians, systematically overcharged procurement contracts with Petrobras, the state-owned oil giant. In return, bureaucrats, politicians, and political parties received bribes and slush campaign funds. In 2015, Petrobras alone admitted losing US\$1.8 billion due to the scheme (Pinotti, 2018). Many company executives and politicians have been arrested and convicted by the Lava Jato operation, including former president Lula da Silva, who has been in jail, convicted of corruption, since April 2018. While the official charge for Dilma’s impeachment was a ‘creative accounting’ irregularity and was not related to Lava Jato, PT became the main target of public outrage towards the corruption scandal (Mello and Spektor, 2018).

After Dilma’s impeachment, vice-president Michel Temer, from the center-right MDB party⁶, became president. In spite of low popular support, the government put forward a series of austerity measures, involving cuts in social rights and budgetary limits for social spending. These reforms were not sufficient to restore economic growth and have been blamed for the worsening of social conditions and increasing dissatisfaction. By September

⁵See also the Operation’s website from the Federal Prosecution Service (Ministério Público Federal, MPF), <http://www.mpf.mp.br/grandes-casos/caso-lava-jato/entenda-o-caso> [in Portuguese, accessed 09.08.2019].

⁶Brazilian Democratic Movement (Movimento Democrático Brasileiro).

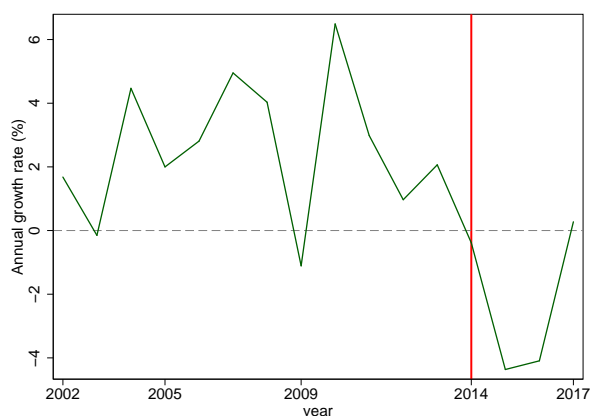


Figure 1: Annual GDP per capita growth rate, constant prices

Notes: Period is 2002–2017. Own calculations from World Bank’s World Development Indicators.

2017, 77% of individuals interviewed rated the government as ‘bad or terrible’, and 92% declared that they did not trust the president.⁷ Consequently, president Temer opted out of the 2018 race. His Finance Minister, Henrique Meirelles, was the MDB candidate and obtained 1.20% of the votes in the 1st round: the worst result in the party’s history.

The other major center-right party, PSDB⁸, governed the country from 1994 to 2002, under president Fernando Henrique Cardoso, and has contested (and lost) every single runoff election since PT took power in 2003. The runoff election of 2014, between Dilma (PT) and Aécio Neves (PSDB), was the closest in Brazilian history, with Dilma winning narrowly, with 51.6% of the votes. Since then, however, several senior PSDB figures have been implicated in corruption scandals, and the party supported both Dilma’s impeachment and the least popular austerity measures of Temer’s government. In the 1st round of 2018, the party’s candidate, Geraldo Alckmin, ranked 4th place with 4.76% of the votes: the worst result in PSDB’s history.

With the collapse of the center-right parties, the 2018 election became a contest between the leftwing PT party and far-right candidate Jair Bolsonaro, from PSL.⁹ PT fielded Lula da Silva as its presidential candidate, with Fernando Haddad—a former Education

⁷‘Ibope survey’ commissioned by the *National Confederation of Industry (CNI)*. Between September 15th and 20th, 2,000 individuals were surveyed in 126 municipalities. The confidence level of the survey is 95%.

⁸Brazilian Social Democracy Party (Partido da Social Democracia Brasileira).

⁹Social Liberal Party (Partido Social Liberal). Notice that, in Brazil, party names often carry little ideological meaning.

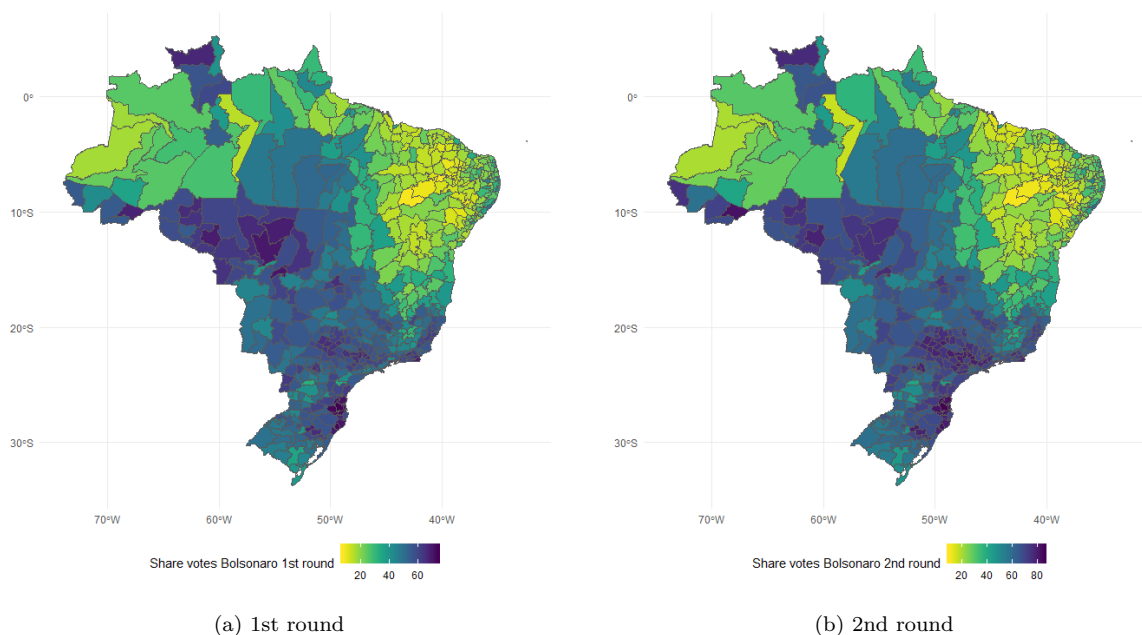


Figure 2: Bolsonaro, % of votes by election round

Notes: % of votes for Jair Bolsonaro (PSL) by microregion and election round. Own calculations from TSE.

Minister and Mayor of São Paulo—as his running mate. By mid-August 2018, election polls showed a difference of 20 percentage points in voting intentions for Lula (39%), the leading candidate, and Bolsonaro (19%), in 2nd place.¹⁰ However, with the impediment of Lula’s candidacy by the Federal Electoral Court, on August 31, due to his corruption conviction, Fernando Haddad became PT’s presidential candidate. Bolsonaro started to gain political space (Hunter and Power, 2019) and eventually won the 1st round of the election, in October 7, with 46.03% of votes, and the runoff round against Haddad, on October 28, with 55.13% of the votes. Figure 2 shows the % of votes for Bolsonaro in each election round, by Brazilian microregion.¹¹ There is a striking degree of variation in support for Bolsonaro across regions. In the runoff round, the % of votes ranged from 10.3% in the microregion Serrana do Sertão Alagoano, in the northeastern state of Alagoas, up to 85.3% in the microregion Blumenau, in the southern state of Santa Catarina.

Although posing as an outsider, Jair Bolsonaro, age 64 and a former Captain for the reserve army, has a long career in politics. Starting in 1988 as a municipal council member

¹⁰Electoral polls conducted by *Instituto Datafolha* on August, 2018.

¹¹A microregion is a statistical unit between a municipality and a federal state. We define microregions more precisely in section 3.

for the city of Rio de Janeiro, he was then elected seven consecutive times as federal deputy for the lower chamber of Congress, between 1991 and 2018. Over his career, he has represented seven different political parties.¹² Of his five children, Bolsonaro's three eldest sons have also become successful politicians: Flávio Bolsonaro, 38, is currently a federal senator representing Rio de Janeiro; Carlos Bolsonaro, 36, is, since 2001, a municipal council member of Rio de Janeiro; and Eduardo Bolsonaro, 35, is, since 2015, a federal deputy representing São Paulo.

Throughout his political career, Bolsonaro became acquainted to the public for views that are widely considered as sexist, homophobic, racist, and, overall, illiberal. As well documented by [Hunter and Power \(2019\)](#), there are plenty of controversial situations involving Bolsonaro. To cite a few examples, in 2003, he stated to a congresswoman that he would not rape her because she was not 'worth' it. In 2016, during the lower chamber's vote to impeach Dilma Rousseff, he dedicated his vote to the memory of Colonel Carlos Alberto Brilhante Ustra, one of the most infamous torturers of the Brazilian military dictatorship (1964–1985).¹³ Apart from this specific episode, Bolsonaro has explicitly supported, in many occasions, the military regime and its regular practice of torturing political opponents. As for his homophobic views, for example, he declared in an interview that he 'would not be able to love a homosexual son'.¹⁴

The 2018 presidential campaign was polarizing, tumultuous, and, at times, violent. On September 1, during a rally in the northern state of Acre, Bolsonaro, while pretending to fire shots with a camera tripod, shouted to a crowd of supporters: "Let's shoot the

¹²Partido Democrata Cristão (PDC, 1988–1993), Partido Progressista (PP, 1993), Partido Progressista Reformador/Partido Progressista Brasileiro/Partido Progressista (PPR/PPB/PP, 1993–2003 and 2005–2016), Partido Trabalhista Brasileiro (PTB, 2003–2005), Partido da Frente Liberal (PFL, 2005), Partido Social Cristão (PSC, 2016–2018), and, currently, Partido Social Liberal (PSL, since 2018).

¹³In her youth, as a member of a far-left armed group fighting the military dictatorship, Dilma had been imprisoned and tortured. Bolsonaro ended his voting statement with the words: "[I]n memory of Colonel Carlos Alberto Brilhante Ustra, the terror of Dilma Rousseff, [...] my vote [for impeachment] is 'Yes!'" (Authors' own translation from Portuguese: "[P]ela memória do Coronel Carlos Alberto Brilhante Ustra, o pavor de Dilma Rousseff, [...] o meu voto é 'Sim!'")

¹⁴The examples mentioned above are widely documented in hundreds of press articles in Portuguese. For a good, popular press piece in English that refers to most of these statements, see "Jair Bolsonaro's Southern Strategy" by John Lee Anderson, published in the *New Yorker*, on April 1, 2019. For an academic reference, see [Hunter and Power \(2019\)](#).

‘petralhada’ [a derogatory term for PT supporters] here in Acre!”¹⁵ Less than one week later, on September 6, during an outdoor campaign event in the southeastern state of Minas Gerais, Bolsonaro was stabbed in the abdomen and badly wounded. The attacker was later declared non-imputable by a federal judge, due to severe mental illness. The campaign was also marked by an unprecedented volume of ‘fake news’ circulating in social media networks (Machado *et al.*, 2018). Besides personal attacks on political figures, on both sides, many viral false claims took aim at the legitimacy and fairness of the electoral process itself.¹⁶

Differently from many other far-right and populist movements, Bolsonaro’s rhetorical attacks did not target only minority groups, but had a clear misogynous component. It seems puzzling, from the perspective of a politician’s strategy, that a candidate would openly insult women in a majoritarian electoral system. We believe that by investigating the economic context that preceded the presidential election, we solve this apparent contradiction. Although the political and social context that culminated with the election of Bolsonaro can be interpreted as a combination of several factors, including rising crime and the *Lava Jato* corruption scandal, we argue that the economic crisis, particularly through its differential gender dimension, has a pivotal role in explaining the electoral outcome. As discussed by Ballard-Rosa *et al.* (2019), economic losses have substantial effects on the social identity of traditionally dominant groups. Once faced with economic misfortunes, those groups answer by increasing aggressiveness in an attempt to maintain their relative status.

In the case of the Brazilian recession that started in 2014, the consequences of the fall in commodity prices was very heterogeneous across sectors. Since the Brazilian labor market

¹⁵Authors’ own translation from Portuguese: “Vamos fuzilar a petralhada aqui do Acre!” See, e.g., <https://exame.abril.com.br/brasil/vamos-fuzilar-a-petralhada-diz-bolsonaro-em-campanha-no-acre/> [accessed on 19.07.2019].

¹⁶The Federal Electoral Court, TSE, created a website to expose and debunk fake news targeting Brazil’s electronic voting system. For an example, see the false claim that a Venezuelan firm manufactured the voting machines, in a conspiracy between Nicolás Maduro’s regime and PT to rig the election (<http://www.tse.jus.br/hotsites/esclarecimentos-informacoes-falsas-eleicoes-2018/empresa-venezuelana-e-responsavel-pelas-urnas-eletronicas.html> [access on 20.07.2019]). Such claims are strikingly similar to Donald Trump’s false ‘massive voter fraud’ claims, in the aftermath of the 2016 US election.

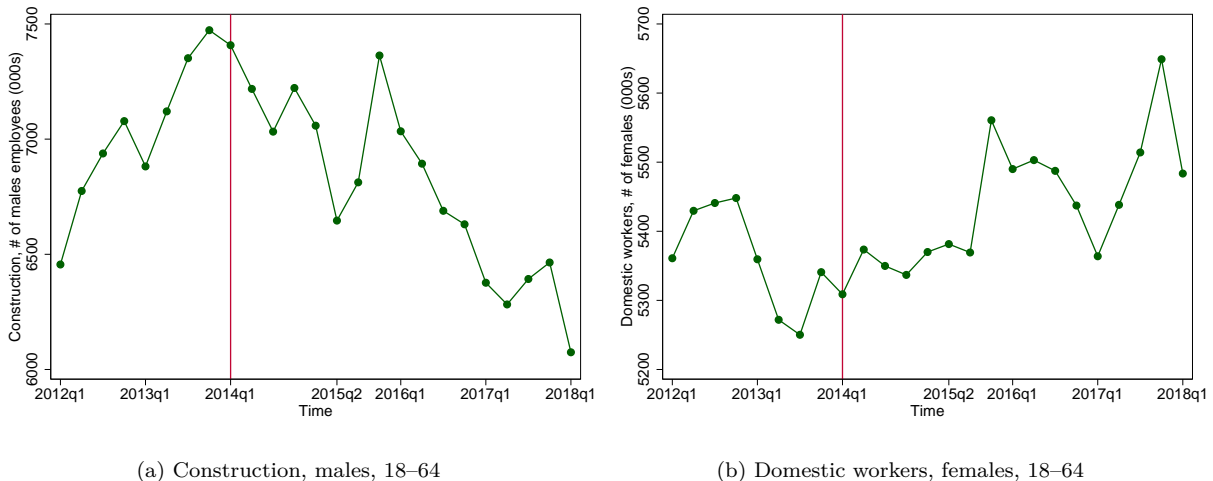


Figure 3: Quarterly employment estimates for selected industries

Notes: Period is 2012q1–2018q1. Own calculations from PNAD Contínua (2012–2018).

Table 1: Voting poll for 2nd round of 2014 and 2018 presidential elections

	2014				2018		
	All	Males	Females		All	Males	Females
Dilma Rousseff (PT)	49%	48%	49%	Fernando Haddad (PT)	41%	37%	44%
Aécio Neves (PSDB)	43%	44%	42%	Jair Bolsonaro (PSL)	47%	54%	41%
Blank/Null	5%	5%	5%	Blank/Null	10%	7%	12%
Undecided	3%	3%	4%	Undecided	2%	1%	3%

Notes: For 2018 the source is IBOPE, ‘Pesquisa de Opinião Pública sobre Assuntos Políticos/Administrativos’, JOB0011-10/2018. The poll was conducted on October 26–27 (the election was on October 28), with a sample of 3,010 respondents in 208 municipalities. For 2014 the source is IBOPE, ‘Pesquisa de Opinião Pública sobre Assuntos Políticos/Administrativos’, JOB0462-14/2014. The poll was conducted on October 24–25 (the election was on October 26), with a sample of 3,010 respondents in 206 municipalities. Both polls were registered at Brazil’s Federal Electoral Court (Tribunal Superior Eleitoral, TSE) with IDs BR-02934/2018 and BR-01195/2014, respectively.

has a great amount of segregation along the gender dimension, the economic shock ended up being very different for men and women. Figure 3 shows the evolution of employment for males working in the construction sector and female domestic workers. These two sectors are the textbook example of gender employment segregation and illustrate well the reasoning why males and females experienced different employment shocks. We argue that, once faced with difficult economic conditions, males responded by voting for a candidate that exacerbates the imaginary of masculinity as a way of compensating for the loss in relative status. Women, on the other hand, when faced with a similar situation were more likely to reject a misogynous figure and to favor a pro-social platform.

Indeed, voting polls suggest that the large political gender gap is specific to the 2018 election. As shown in Table 1, the gender gap in 2014, when a female candidate ran against a male candidate, was much smaller than the gender gap in 2018 election, when the two

candidates were men. This already hints to the fact that there is something unusual about the 2018 presidential election.

3 Empirical Strategy

Our empirical strategy relies on a Bartik-type labor demand shock (Bartik, 1991). We measure the labor demand shock using a shift-share variable at the local labor market level: a Brazilian microregion.¹⁷ For microregion r , the overall shift-share variable is defined as:

$$\dot{L}_r = \sum_i \frac{L_{ri}^0}{L_r^0} \dot{L}_i \quad (1)$$

where the *shift*, $\dot{L}_i \equiv \log(\bar{L}_{i,2012q3:2013q3}) - \log(\bar{L}_{i,2017q3:2018q3})$, is the log difference in average employment for industry i between the pre-crisis period and the pre-election period. We compute \dot{L}_i from PNAD¹⁸ Contínua, a quarterly household survey that covers the formal and informal sectors and is the source for official unemployment statistics reported by IBGE. For the pre-crisis period, we pool all survey waves between the 3rd quarter of 2012 and the 3rd quarter of 2013. For the pre-election period, we pool the waves between the 3rd quarter of 2017 and the 3rd quarter of 2018. Using the most disaggregated industry variable available in PNAD Contínua, we calculate average employment changes between the two periods for 223 industries.¹⁹ The *share*, $\frac{L_{ri}^0}{L_r^0}$, is industry i 's share of total employment in microregion r , computed from the 2010 Census for the age group 18–64. The larger \dot{L}_r , the larger the employment *loss*, i.e., the larger the shock to labor demand experienced by microregion r .

To create labor demand shocks by gender ($m = \text{males}$, $f = \text{females}$), we construct the following measures:

¹⁷A microregion is group of contiguous municipalities that are economically integrated, as defined by the Brazilian Statistical Agency (Instituto Brasileiro de Geografia e Estatística, IBGE). In the literature, microregions have been the unit of choice to define a Brazilian local labor market. We use the microregion boundaries of the 2010 Census.

¹⁸*Pesquisa Nacional por Amostra de Domicílios* (National Household Sample Survey).

¹⁹Corresponding to the 5-digit level of CNAE Domiciliar 2.0—Brazil's classification of economic activities since 2006.

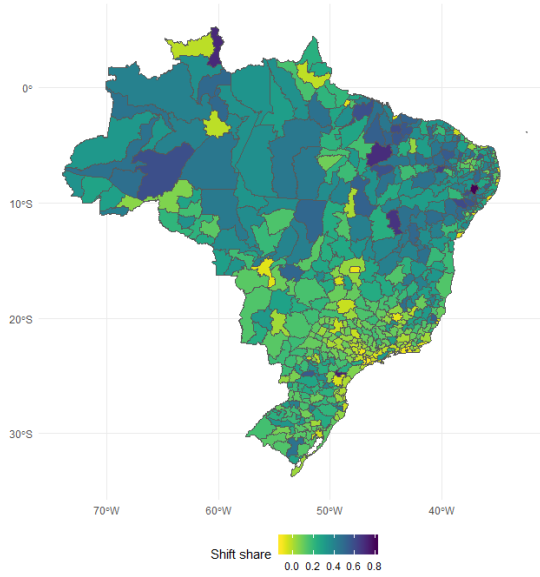


Figure 4: Labor demand shock (overall)

Notes: Overall shock is defined in equation (1).

$$\dot{L}_r^m = \sum_i \frac{m_{ri}^0 L_{ri}^0}{L_r^0} \dot{L}_i \text{ and } \dot{L}_r^f = \sum_i \frac{(1 - m_{ri}^0) L_{ri}^0}{L_r^0} \dot{L}_i \quad (2)$$

where m_{ri}^0 is the male share of industry i 's employment in microregion r , from the 2010 Census. Finally, we compute similar shocks by race—with superscript w for whites, and nw for nonwhites.²⁰

There are three main sources of variation in the shift-share measures. First, the employment change due to the economic crisis varies across industries. Second, microregions differ in their pre-crisis industry-mix of employment. The overall shock measure only uses these two sources of variation. But, for the gender- and race-specific shocks, a third source of variation are differences across microregions in pre-crisis industry employment composition by gender and race. Altogether, there is substantial variation in shock intensity across the 558 microregions of territorial Brazil, both for the overall shock (Figure 4), the gender-specific shocks (Figure 5), and the race-specific shocks (Figure 6). Table 2 displays summary statistics for the shock variables. On average, men and nonwhites are

²⁰The IBGE's racial/ethnic classification consists of 'White' (*Branca*), 'Black' (*Preta*), 'Asian' (*Amarela*), 'Brown' (*Parda*), and 'Native' (*Indígena*). We combine 'White' and 'Asian' as *white* and the remaining as *nonwhite*.

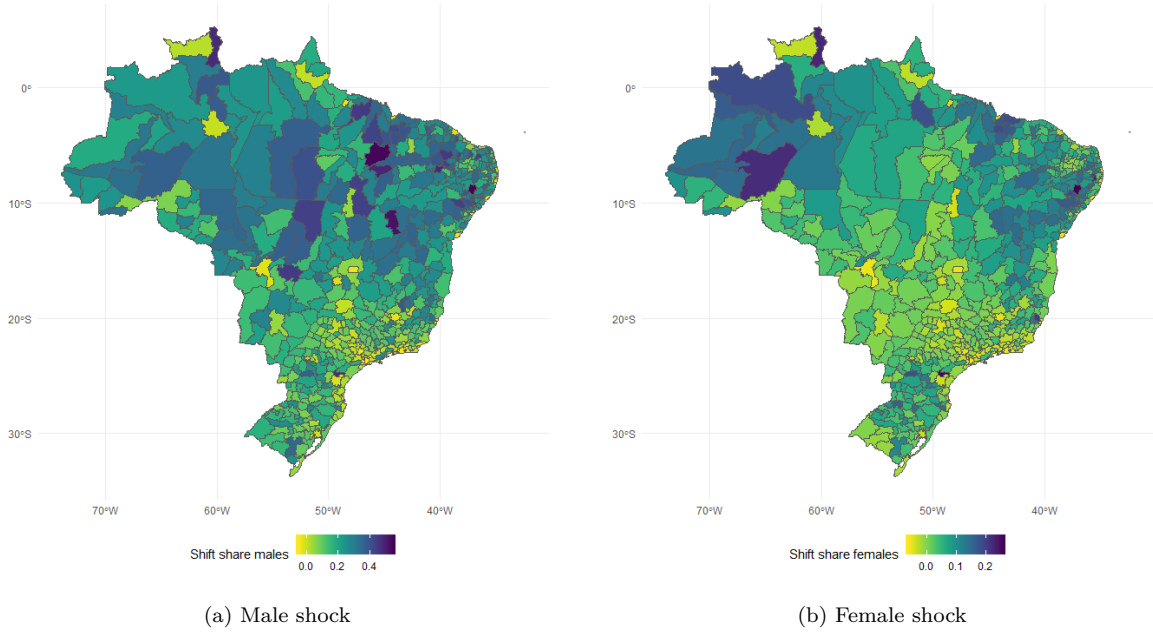


Figure 5: Labor demand shock by gender

Notes: Male shock is \dot{L}_r^m and female shock is \dot{L}_r^f , as defined in equation (2).

much harder hit by the crisis than women and whites, respectively. Across genders, the average male shock accounts for 82% of the average overall shock; across racial groups, the nonwhite shock accounts for 68% of the average overall shock. In fact, the male (nonwhite) shock first-order stochastically dominates the female (white) shock (Figure 7). Within microregions, the gender shocks are highly correlated ($\rho = 0.8$, Figure A1a).²¹ The race-specific shocks, in turn, correlate much less ($\rho = 0.3$, Figure A1b), due to the relatively high level of spatial segregation by race in Brazil.²² As we will shown later, despite the high correlation between male and female shocks, we have enough statistical power to precisely estimate their independent impacts on electoral outcomes.

We use the labor demand shocks to estimate Bartik-type reduced-form regressions. Illustrating with the gender-specific shift-shares, our preferred regression equation is:

$$\Delta_{18-14}Votes_r = \beta_m \dot{L}_r^m + \beta_f \dot{L}_r^f + \delta \Delta_{14-10}Votes_r + \mathbf{X}_{10,r}\gamma + \eta_s + \epsilon_r, \quad (3)$$

²¹Throughout the paper, Tables and Figures whose number is prefixed by *A* are reported in the Online Appendix, rather than in the main text.

²²In 2010, in the average microregion, 54% of the adult (18+), out-of-school population was nonwhite. The standard deviation was 21%, with the % of nonwhites in a microregion ranging from 6% (Tabuleiro, in the southeastern state of Santa Catarina) to 91% (Rio Negro, in the northern state of Amazonas). See Table 3.

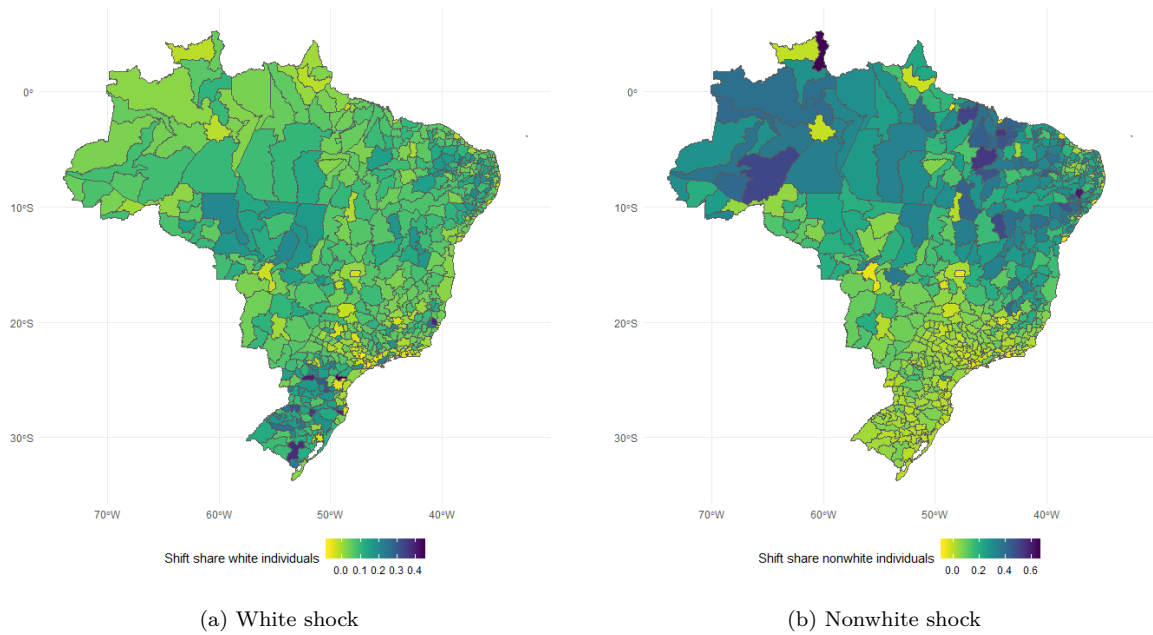


Figure 6: Labor demand shock by race

Notes: White shock is \dot{L}_r^w and nonwhite shock is \dot{L}_r^{nw} , as defined in equation (2).

The dependent variable, $\Delta_{18-14}Votes_r$, is the difference in an electoral outcome between the 2018 and 2014 presidential elections. We estimate models for four electoral outcomes: (1) the percentage point change in votes for PT, (2) the percentage point change of votes for Bolsonaro²³, (3) the percentage point change in the abstention rate, and (4) the percentage point change in invalid votes (nulls or blanks). For the gender-specific shock regressions, shown in (3), our coefficients of interest are β_m and β_f —the conditional effect of the male and female shift-shares, respectively. Table 2 reports descriptive statistics for the outcome and shock variables.

Since the model is estimated in differences, microregion-specific time invariant characteristics are removed. In addition, we add three sets of control variables. First, we control for the lagged dependent variable, $\Delta_{14-10}Votes_r$, which is the difference between the electoral outcome in the 2014 and 2010 presidential elections.²⁴ Next, vector $\mathbf{X}_{10,r}$

²³Since 2018 was Bolsonaro’s first run for president, his percentage point change between 2018 and 2014 equals his percentage of votes in 2018. Later on, in robustness checks, we will relax this equality, by allowing ‘far-right’ baseline values in 2014 that differ from zero. All results remain qualitatively unchanged.

²⁴Because Bolsonaro did not run before 2018, when modeling his percentage of votes in 2018, we proxy the lagged dependent variable by the percentage point change in Dilma’s (PT) votes between 2014 and 2010.

Table 2: Descriptive statistics: dependent and economic shock variables

	mean	sd	min	max
<i>Election outcomes: 1st round</i>				
Bolsonaro, % of votes	40.78	18.36	7.24	74.50
Δ_{18-14} PT, % votes	-12.55	9.21	-50.21	16.88
Δ_{18-14} abstention, %	0.19	3.73	-12.66	10.52
Δ_{18-14} null/blank, %	-0.35	1.79	-8.66	4.52
<i>2nd round</i>				
Bolsonaro, % of votes	48.61	21.43	10.30	85.35
Δ_{18-14} PT, % votes	-5.37	7.17	-33.64	10.27
Δ_{18-14} abstention, %	-0.17	4.02	-12.49	12.30
Δ_{18-14} null/blank, %	3.15	3.09	-3.58	11.90
<i>Shock variables:</i>				
Shock (overall)	0.22	0.17	-0.12	0.81
Male shock	0.18	0.12	-0.05	0.55
Female shock	0.04	0.06	-0.07	0.26
White shock	0.07	0.07	-0.07	0.44
Nonwhite shock	0.15	0.14	-0.07	0.66
<i>N</i>	558			

Table 3: Descriptive statistics: control variables from 2010 Census

	mean	sd	min	max
Employment share	0.60	0.07	0.43	0.85
Male pop. share	0.50	0.02	0.45	0.56
Nonwhite pop. share	0.54	0.22	0.06	0.91
<i>Education attainment:</i>				
Less than primary	0.59	0.11	0.25	0.85
Primary	0.14	0.03	0.06	0.35
Secondary	0.21	0.06	0.07	0.45
Tertiary	0.06	0.03	0.02	0.22
Bolsa Família recipients	0.10	0.07	0.00	0.25
Construction share	0.04	0.01	0.00	0.10
<i>N</i>	558			

includes pre-crisis socio-demographics and election results for each microregion, both measured in 2010. The socio-demographics come from the 2010 Census and refer to the out-of-school adult population (18+). We include the microregion’s employment share, the share of males, the share of nonwhites, the shares with completed primary, secondary, or tertiary education, the share of recipients of Bolsa Família²⁵, and the share employed in the construction sector (1-digit level). Table 3 reports descriptive statistics for the 2010 socio-demographics. The 2010 election controls include the 1st round % of votes for the main candidates: Serra (PSDB) and Marina (PV), the 2nd and 3rd most voted candidates, with the most voted—Dilma (PT)—being the omitted %. We also add the % of votes

²⁵Bolsa Família is the flagship federal conditional cash transfer that became highly popular and is an important predictor of political support for PT (see, for example, Table A1). The Census variable also includes recipients of the federal program against child labor (Programa de Erradicação do Trabalho Infantil, PETI).

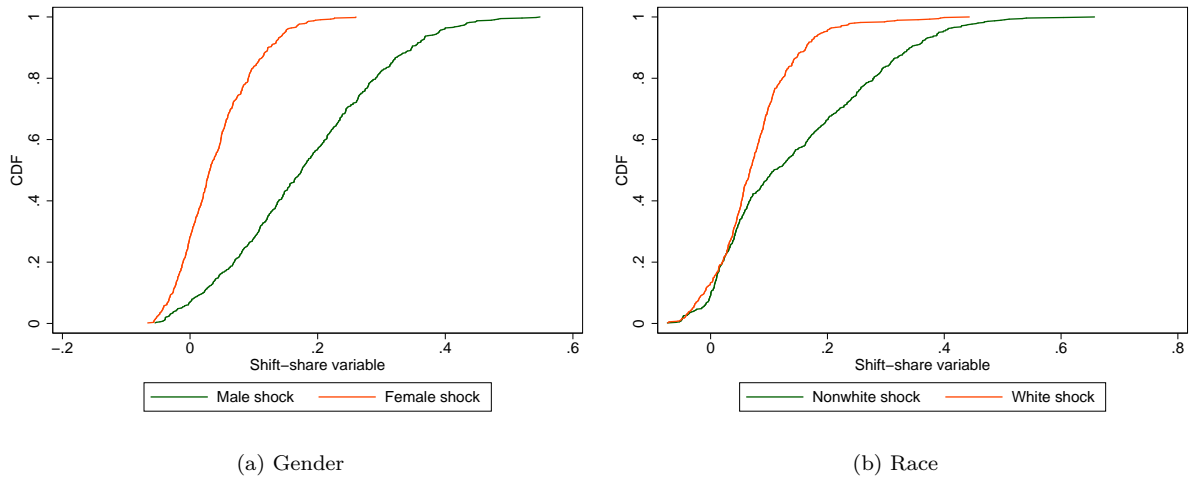


Figure 7: First-order stochastic dominance between gender- and race-specific shocks.

Notes: CDF is the empirical cumulative distribution function of the shock variables. Male (female) shock is \dot{L}_r^m (\dot{L}_r^f), and white (nonwhite) shock is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2).

for Fidelix (PRTB), who ran a far-right political platform, and the % of votes for the other remaining candidates.²⁶ The % of null/blank votes and the abstention rate are also controlled for. Table 4 shows descriptives for the 2010 election. As a third set of controls, the model includes state dummies η_s . Altogether, our preferred specification flexibly allows for differential trends based on pre-crisis socio-demographic and political preferences, at the microregion level, and, at a higher level, state-specific trends. All electoral data are made publicly available by Brazil’s Federal Electoral Court (Tribunal Superior Eleitoral, TSE). We cluster standard errors at the microregion level, but we will later assess robustness to other cluster-levels.

To obtain causal estimates for the shift-share coefficients, it is enough to assume that the *shift* component—i.e., aggregate change in employment by industry—is exogenous to local election outcomes. We believe that our control variable strategy justifies this assumption. In particular, we include the share of employment in the construction sector, because the expansion and contraction cycles of this sector could have been, in part, politically driven. In 2014, Brazil hosted the FIFA (Soccer) World Cup and, in 2016, Rio de Janeiro hosted the Summer Olympics, with both events involving sizable investments in physical infrastructure. In addition, the *Lava Jato* corruption scandal hit the construction

²⁶The candidate with the most far-right platform in the 2010 and 2014 elections, Levy Fidelix (PRTB), performed very poorly. He obtained 57,960 votes (0.06%) in 2010 and 446,878 votes (0.43%) in 2014.

Table 4: Descriptive statistics: control variables from past elections

	mean	sd	min	max
<i>Election outcomes, 2010: 1st round</i>				
Dilma (PT)	52.65	15.26	16.96	85.13
Serra (PSDB)	33.74	12.98	6.38	61.21
Marina (PV)	12.81	6.88	2.58	41.96
Fidelix (PRTB)	0.05	0.03	0.00	0.28
Other	0.74	0.34	0.21	2.43
Null/blank	9.17	2.84	3.73	17.70
Abstention	20.08	4.64	8.76	39.36
<i>Δ_{14-10}: 1st round</i>				
Dilma, % of votes	-2.56	6.90	-30.07	15.29
Abstention, %	0.89	2.46	-8.75	5.63
Null/blank, %	-0.57	2.17	-7.73	6.29
<i>Δ_{14-10}: 2nd round</i>				
Dilma, % of votes	-1.23	6.95	-21.60	22.64
Abstention, %	-0.65	2.95	-20.82	4.35
Null/blank, %	-0.52	1.84	-6.16	5.45
<i>N</i>	558			

sector particularly hard, since most of the largest construction firms in the country were criminally convicted of wrongdoing. By controlling for the pre-crisis relative size of the construction sector, we alleviate the concern that the bust of this specific sector might correlate with unobservable determinants of local political preferences. Finally, state-specific trends are a particularly powerful control: state-specific trends *alone* absorb 79% of the microregional variation in the percentage point change in votes for PT (2018–14, 1st round).²⁷

The regression models based in (3) suffer from two shortcomings. First, we cannot infer individual behavior from microregion level aggregates—i.e., we are essentially estimating ‘ecological’ regressions. Because individual voting behavior is unobservable, we cannot decisively show that the gender- and race-specific shocks indeed affect the corresponding gender and race group. Second, our empirical strategy relies on variation across microregions and, as a result, cannot inform which factors contributed to the common-trend component of Bolsonaro’s electoral success. While we cannot address this shortcoming, since Bolsonaro first presidential run was in 2018, we use our preferred model estimates to perform a counterfactual exercise, later on. The exercise quantifies the electoral impact of

²⁷For the 2nd round, the R^2 is lower, 0.57. For the percentage of votes for Bolsonaro: $R^2 = 0.79$ (1st round), and = 0.82 (2nd round). To be precise, state dummies include the 26 federal states and the federal district (Brasília).

counterfactual shocks, changing their incidence (by gender and race) and their magnitude. In particular, we estimate which shock magnitude-distribution mix would have elected Bolsonaro directly on the 1st round of the election, and, alternatively, which shock mix would have tipped over the election in favor of the leftwing PT candidate, Haddad, in the 2nd round.

4 Results

We start by discussing the results for the change in PT and Bolsonaro votes, and then explore models for the change in abstention rates and percentage of invalid votes. Finally, we benchmark our estimates with simple counterfactual exercises.

Change in PT and Bolsonaro votes Panel A of Table 5 estimates the effect of the overall shock, \dot{L}_r , on the percentage point change in PT votes between the 1st election round of 2018 and 2014. On average, across the 558 microregions, PT lost 12.6 percentage points (ppts), with the maximum *loss* in a region being 50.2 ppts and the maximum *gain* being 16.9 ppts.²⁸ For all panels, columns 1–5 sequentially introduce sets of controls, with the fully-specified model of equation (3) shown in column 5. In the first two columns, there is a positive and significant correlation between the overall shock intensity and the percentage point change in votes for PT’s presidential candidate. However, this pattern vanishes once socio-demographic controls are included (column 3). This suggests that the overall shock hit disproportionately microregions whose pre-crisis socio-demographics were already predictive of rising support for PT over time. For the full model, in column 5, the effect is very small and statistically indistinguishable from zero. In sum, we find

²⁸The maximum loss occurred in Meruoca, in the northeastern state of Ceará, where most of the PT votes in 2014 were transferred to the 2018 center-left, home-state candidate, Ciro Gomes (PDT), with Bolsonaro receiving 9.6% of the 1st round votes. (See also Figure A2.) The maximum gain occurred in Mata Meridional Pernambucana, in the northeastern state of Pernambuco. When each microregion is weighted by its share of total national valid votes, the average 2018–14 PT loss is very similar to unweighted average: 12.3 vs. 12.6 ppts. Throughout, the figures we present do not exactly match the official election results reported by TSE, because we only include votes from within territorial Brazil and exclude (the relatively few) votes from abroad. For a map plotting the change in PT votes between 2014 and 2018 in both election rounds, see Figure A3.

no evidence that average exposure to the 2014–17 labor demand shock affects the voting propensity for the leftwing PT candidate.

However, the null overall effect masks a striking gender-specific effect. Panel B, column 5, shows that the gender-specific shocks have opposite, and statistically significant, impacts on votes for PT. The stronger the shock hitting men, the larger the decline in a region’s percentage point change of votes for PT (relative to 2014). Female shocks have the opposing effect, increasing PT votes over time. The coefficient of the female shock is more than twice as large (in absolute value) than the male coefficient. However, because the male first-order stochastically dominates the female shock, the standardized effects turn out to be of similar magnitude. A one SD increase in the shock intensity for men reduces PT votes by 1.2 ppts (-10.2338×0.12) from 2014 to 2018. A one SD increase in the shock intensity for women *increases* PT votes by 1.5 ppts (24.9837×0.06) from 2014 to 2018. For the male (female) shock, the standardized effect is 10% (12%) of the 12.55 ppt loss in PT votes for the average microregion, in the 1st round.

The race-specific shock estimates are shown in panel C. Similar to the overall shock, we find no significant effects once we control for socio-demographics (columns 3–5). In panels D-F, all models are re-estimated using results from the 2nd round of the 2018 and 2014 elections. In the average microregion, PT’s candidate lost 5.4 ppts relative to 2014’s runoff election.²⁹ We still find null effects for the overall shock (panel D) and the race-specific shocks (panel F). For the gender-specific shocks (panel E), the negative effect of the female shock is only marginally smaller (in absolute value) than in the 1st round, with one SD increase leading to a 1.25 ppt (20.8310×0.06) gain in PT votes. This estimate is sizable, corresponding to 23% of the 5.37 ppts loss in PT votes for the average microregion, in the runoff round. In contrast, the coefficient for the male shock is nearly half the size of the 1st round coefficient and loses statistical significance at conventional levels.

In Table 6, the outcome variable is the % of votes for Bolsonaro in the 1st (panels A-C) and runoff (panels D-F) round of the 2018 election. The estimates are consistent with

²⁹The maximum loss, 33.6 ppts, occurred in Itaguaí, in the southeastern state of Rio de Janeiro. The maximum gain, 10.3 ppts, occurred in Portel, in the northern state of Pará.

Table 5: Change in PT votes, 2018–2014

Δ_{18-14} PT, % of votes: 1st round					
<i>Panel A: Overall shock</i>	(1)	(2)	(3)	(4)	(5)
Shock (overall)	6.3511*** (2.3332)	6.5159*** (1.4878)	-1.4564 (2.4962)	-1.1016 (2.3805)	0.4787 (1.9524)
<i>Panel B: Shock by gender</i>	(1)	(2)	(3)	(4)	(5)
Male shock	-14.6419** (5.9255)	6.2607* (3.5132)	-5.5490 (3.9018)	-7.2636* (3.8578)	-10.2338*** (3.1059)
Female shock	53.3173*** (10.2534)	7.0929 (7.5573)	8.1099 (7.1569)	12.8809* (6.8179)	24.9837*** (5.7282)
<i>Panel C: Shock by race</i>	(1)	(2)	(3)	(4)	(5)
White shock	-16.9607*** (4.6791)	-10.4817*** (3.6566)	-2.4145 (4.6528)	2.1278 (4.3636)	2.9475 (3.8975)
Nonwhite shock	15.1856*** (2.8283)	16.5558*** (2.6268)	-0.8060 (3.7317)	-3.2438 (3.6079)	-1.1618 (3.0340)
Δ_{18-14} PT, % of votes: 2nd round					
<i>Panel D: Overall shock</i>	(1)	(2)	(3)	(4)	(5)
Shock (overall)	20.7839*** (1.5050)	15.5957*** (1.5093)	2.7538 (2.3606)	2.5067 (2.3401)	2.4649 (2.2021)
<i>Panel E: Shock by gender</i>	(1)	(2)	(3)	(4)	(5)
Male shock	11.6519*** (3.5853)	11.0780*** (3.8125)	-0.7923 (3.8138)	-2.6233 (3.9091)	-5.6310 (3.6198)
Female shock	41.2143*** (7.7419)	25.8049*** (7.9526)	11.0427 (7.6648)	14.1471* (7.5619)	20.8310*** (6.9552)
<i>Panel F: Shock by race</i>	(1)	(2)	(3)	(4)	(5)
White shock	4.8914 (3.4767)	3.5930 (3.6701)	0.0184 (4.9096)	4.2196 (4.6843)	4.2888 (4.7619)
Nonwhite shock	26.8067*** (1.9261)	22.6852*** (2.7108)	4.6105 (3.9493)	1.3703 (4.0105)	1.2549 (3.7965)
<i>Control variables in all panels:</i>					
State-specific trends	No	Yes	Yes	Yes	Yes
Socio-demographics	No	No	Yes	Yes	Yes
Election 2010	No	No	No	Yes	Yes
Δ_{14-10} Dilma, % of votes	No	No	No	No	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of votes for PT (Workers' Party) between the 2018 and 2014 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. 'Male (female) shock' is \dot{L}_r^m (\dot{L}_r^f) and 'white (nonwhite) shock' is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). 'Overall shock' is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. 'Socio-demographics' refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Familia or PETI recipients, and share employed in construction sector (1-digit). 'Election 2010' are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ' Δ_{14-10} Dilma, % of votes' is the change in the % of votes for Dilma (PT) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

patterns observed for PT in Table 5. We find null effects for the overall and race-specific shocks in both election rounds. For the gender shocks, our estimates are symmetric to those for PT: a strong positive effect of the male shock in the 1st round, which becomes weaker and loses significance in the runoff; and a strong and negative effect of the female shock in both rounds. A one SD increase in the male shock leads to a 1.05 ppt gain for Bolsonaro in the first round; whereas a one SD increase in the female shock reduces his share of votes by 0.94 ppts in the 1st round and by 1.02 ppts in the 2nd round.

In sum, we find that average exposure to the 2014–17 labor demand shock, or exposure by race, does not affect support for PT or Bolsonaro. In sharp contrast, however, we find large and significant effects by gender. The male shock has a strong positive [negative] effect in the 1st round for Bolsonaro [PT], but loses significance in the runoff; the female shock has a strong negative [positive] effect in both rounds for Bolsonaro [PT].

Change in abstention and null/blank votes We now proceed by investigating the impact of the economic shock on changes in voter turnout and invalid ballots (null/blank). Table 7 shows estimates for the percentage point change in the abstention rate, between 2014 and 2018. In Brazil, voting is compulsory for the literate population aged 18–70. (The minimum voting age is 16.) In practice, voters that fail to comply with compulsory voting need to justify the reason for abstention (whose veracity is effectively impossible to monitor) and pay a symbolic fine of R\$3.51 (\approx US\$0.95, in 31.10.2018) per election round. In the 1st (2nd) round, in 2018, the average microregion had an abstention rate of 21.2% (22.9%) of eligible voters, representing a 0.19 (-0.17) ppts change from the respective round in 2014.³⁰ Across all shocks, the only statistically significant and sizable coefficient is the one for the female shock variable, in both election rounds (panels B and E). In microregions where women experience a more severe labor demand shock, abstention rates decline, with a one SD increase in the female shock leading to a 0.9 ppt drop in abstention, in both rounds.

³⁰In the 1st round of 2018, abstention ranged from 9.2% in Nordeste Roraima (in the northern state of Roraima) to 39.3% in Japurá (in the northern state of Amazonas). For a map showing microregion variation in the percentage point change in abstention rates between 2018 and 2014, by election round, see Figure A4.

Table 6: Bolsonaro vote share, 2018

	Bolsonaro, % of votes: 1st round				
<i>Panel A: Overall shock</i>	(1)	(2)	(3)	(4)	(5)
Shock (overall)	-64.8769*** (3.3498)	-32.0538*** (2.4402)	-3.1089 (3.2802)	-0.1783 (2.6708)	1.3155 (2.3345)
<i>Panel B: Shock by gender</i>	(1)	(2)	(3)	(4)	(5)
Male shock	-43.1637*** (9.8623)	-14.6606** (6.1914)	13.5211*** (4.7652)	11.3735*** (4.2351)	8.7450** (3.8550)
Female shock	-113.4544*** (20.9204)	-71.3596*** (13.5134)	-41.9803*** (9.8879)	-26.3906*** (8.3491)	-15.6799** (7.5242)
<i>Panel C: Shock by race</i>	(1)	(2)	(3)	(4)	(5)
White shock	25.4491*** (7.3722)	4.0452 (6.4372)	-15.0558** (6.4792)	-5.8203 (6.5252)	-5.0425 (5.3624)
Nonwhite shock	-99.1078*** (4.6144)	-53.3759*** (4.0071)	5.0000 (4.7971)	3.5645 (4.2406)	5.5402 (3.8792)
	Bolsonaro, % of votes: 2nd round				
<i>Panel D: Overall shock</i>	(1)	(2)	(3)	(4)	(5)
Shock (overall)	-77.7612*** (3.8536)	-35.3462*** (2.7201)	-4.4029 (3.3896)	-0.4155 (2.5854)	-0.4761 (2.1424)
<i>Panel E: Shock by gender</i>	(1)	(2)	(3)	(4)	(5)
Male shock	-55.7785*** (10.7642)	-19.4870*** (6.7320)	11.7315** (4.8453)	10.9399*** (4.0253)	6.7982* (3.5342)
Female shock	-126.9415*** (23.4887)	-71.1853*** (14.9379)	-42.1159*** (10.4963)	-26.1821*** (8.2512)	-16.9783** (7.1497)
<i>Panel F: Shock by race</i>	(1)	(2)	(3)	(4)	(5)
White shock	29.7359*** (8.0668)	8.2673 (6.9516)	-18.1610*** (6.4789)	-5.9950 (6.2114)	-5.8946 (4.9817)
Nonwhite shock	-118.4995*** (5.2999)	-61.1068*** (4.4583)	4.9353 (5.0771)	3.2859 (4.2761)	3.1184 (3.8062)
	<i>Control variables in all panels:</i>				
State dummies	No	Yes	Yes	Yes	Yes
Socio-demographics	No	No	Yes	Yes	Yes
Election 2010	No	No	No	Yes	Yes
Δ_{14-10} Dilma, % of votes	No	No	No	No	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the % of votes for Jair Bolsonaro (PSL) in the 2018 election, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. ‘Male (female) shock’ is \dot{L}_r^m (\dot{L}_r^f) and ‘white (nonwhite) shock’ is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETI recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} Dilma, % of votes’ is the change in the % of votes for Dilma (PT) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Change in abstention rate, 2018–2014

	Δ_{18-14} abstention, %: 1st round				
	(1)	(2)	(3)	(4)	(5)
<i>Panel A: Overall shock</i>					
Shock (overall)	-7.8305*** (0.8902)	-4.1443*** (1.0037)	-1.5821 (1.6792)	-1.6601 (1.6881)	-1.5981 (1.5783)
<i>Panel B: Shock by gender</i>					
Male shock	-7.2165*** (2.0668)	-1.4450 (2.2465)	2.6804 (2.9363)	2.8038 (3.0156)	4.1058 (2.7256)
Female shock	-9.2043* (4.7966)	-10.2443** (4.5691)	-11.5453** (5.3202)	-11.7892** (5.4821)	-14.5382*** (4.8255)
<i>Panel C: Shock by race</i>					
White shock	-6.7627*** (1.8376)	-1.1435 (2.1044)	-2.5591 (2.8189)	-3.8960 (2.8032)	-3.5175 (2.4881)
Nonwhite shock	-8.2352*** (1.2377)	-5.9168*** (1.6947)	-0.9189 (2.4585)	-0.1768 (2.5954)	-0.3249 (2.2772)
	Δ_{18-14} abstention, %: 2nd round				
	(1)	(2)	(3)	(4)	(5)
<i>Panel D: Overall shock</i>					
Shock (overall)	-7.0838*** (0.9742)	-3.6811*** (1.1265)	-1.7733 (1.8467)	-1.9447 (1.8788)	-1.1314 (1.6941)
<i>Panel E: Shock by gender</i>					
Male shock	-5.7651*** (2.1885)	0.3182 (2.4070)	4.0474 (3.2548)	3.9099 (3.3440)	4.9807* (2.8399)
Female shock	-10.0339** (5.1044)	-12.7190** (4.9762)	-15.3787*** (5.9162)	-15.2293** (6.0561)	-14.9946*** (5.0118)
<i>Panel F: Shock by race</i>					
White shock	-8.5401*** (2.1079)	-1.2808 (2.3436)	-2.8541 (3.1851)	-4.4325 (3.1544)	-2.5786 (2.7164)
Nonwhite shock	-6.5319*** (1.3870)	-5.0989*** (1.9487)	-1.0397 (2.7296)	-0.2943 (2.9152)	-0.1732 (2.5275)
<i>Control variables in all panels:</i>					
State-specific trends	No	Yes	Yes	Yes	Yes
Socio-demographics	No	No	Yes	Yes	Yes
Election 2010	No	No	No	Yes	Yes
Δ_{14-10} abstention	No	No	No	No	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of abstention between the 2018 and 2014 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. ‘Male (female) shock’ is \dot{L}_r^m (\dot{L}_r^f) and ‘white (nonwhite) shock’ is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Familia or PETI recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} abstention’ is the change in the % of abstention between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Voters may, of course, turn up at the ballot box, but still opt for casting a null or blank vote. In the Brazilian system, invalid votes are not considered in the denominator of the % of votes for each candidate. Table 8 shows estimates for the percentage point change in invalid votes, between 2014 and 2018. In the both rounds, in 2018, the average microregion’s % of null/blank votes was approximately 8%, representing a -0.35 (3.15) ppts change from the 1st (2nd) round in 2014.³¹ In the first round, we find no effect of the overall shock (panel A) or the gender-specific shock (panel B) on invalid votes. We do find, however, symmetric effects by race: positive and significant for whites, negative and significant for nonwhites. These effects remain qualitatively similar in the 2nd round. In microregions where the white shock increases by one SD, invalid votes increase by 0.31 ppts (4.4796×0.07), in the 1st round, and 0.23 ppts (3.2331×0.07), in the 2nd round; one SD increase in the nonwhite shock decreases invalid votes by 0.40 ppts (-2.8668×0.14), in the 1st round, and 0.36 ppts (-2.5492×0.14), in the 2nd round. Moreover, in the 2nd, there is a significant negative effect of the female shock on invalid votes, with a one SD increase in the female shock leading to a 0.21 ppt (-3.5765×0.06) drop in null/blank votes.

In sum, we find that the female shock reduces abstention rates, in both rounds, and invalid votes, in the runoff round. By race, our estimates suggest that, in both rounds, the white shock increases invalid votes, whereas the nonwhite shock decreases such votes.

Counterfactual shocks and election outcomes It is helpful to benchmark the magnitude of the gender-specific effects with respect to Bolsonaro’s victory margins. We propose two simple counterfactual exercises. First, how large would the male shock have to be to elect Bolsonaro directly in the 1st round? Second, how large would the female shock have to be to overturn the 2nd round outcome and elect the PT candidate, Fernando Haddad? Both counterfactuals are based in the OLS estimates for Bolsonaro’s % of votes from our preferred specification in column 5 of Table 6 (panels B and E).

³¹In the 1st round of 2018, invalid votes ranged from 3.2% in Japurá (in the northern state of Amazonas) to 14.6% in Suape (in the northeastern state of Pernambuco). For a map showing microregion variation in the percentage point change in invalid votes between 2018 and 2014, by election round, see Figure A5.

Table 8: Change in invalid votes (null/blank), 2018–2014

	Δ_{18-14} null/blank, %: 1st round				
	(1)	(2)	(3)	(4)	(5)
<i>Panel A: Overall shock</i>					
Shock (overall)	-0.9656** (0.4613)	1.0124*** (0.3769)	-0.0142 (0.4896)	0.2817 (0.4689)	0.0518 (0.4592)
<i>Panel B: Shock by gender</i>					
Male shock	-1.6508 (1.0657)	1.9242** (0.7500)	1.1937 (0.8012)	1.3389 (0.8240)	0.4130 (0.8053)
Female shock	0.5674 (2.2063)	-1.0481 (1.4225)	-2.8375* (1.5126)	-2.1172 (1.4668)	-0.7616 (1.4212)
<i>Panel C: Shock by race</i>					
White shock	4.7147*** (0.9508)	6.5366*** (0.7783)	5.5002*** (1.0114)	5.1546*** (1.0114)	4.4796*** (0.9306)
Nonwhite shock	-3.1182*** (0.4966)	-2.2505*** (0.5124)	-3.7570*** (0.7101)	-2.9508*** (0.6481)	-2.8668*** (0.6294)
	Δ_{18-14} null/blank, %: 2nd round				
	(1)	(2)	(3)	(4)	(5)
<i>Panel D: Overall shock</i>					
Shock (overall)	-5.5713*** (0.6667)	0.3983 (0.3467)	-0.3564 (0.5435)	-0.1264 (0.5487)	-0.2512 (0.5558)
<i>Panel E: Shock by gender</i>					
Male shock	-3.8883*** (1.4885)	0.7679 (0.7933)	1.1855 (0.9293)	1.3932 (0.9808)	1.2185 (0.9826)
Female shock	-9.3367*** (2.9024)	-0.4368 (1.4400)	-3.9603** (1.7079)	-3.5746** (1.6505)	-3.5765** (1.6383)
<i>Panel F: Shock by race</i>					
White shock	1.1514 (1.3824)	4.1085*** (0.8159)	2.8411*** (1.0394)	3.4326*** (1.0580)	3.2331*** (1.0736)
Nonwhite shock	-8.1190*** (0.7788)	-1.7931*** (0.5862)	-2.5266*** (0.7975)	-2.4874*** (0.7842)	-2.5492*** (0.7906)
<i>Control variables in all panels:</i>					
State-specific trends	No	Yes	Yes	Yes	Yes
Socio-demographics	No	No	Yes	Yes	Yes
Election 2010	No	No	No	Yes	Yes
Δ_{14-10} null/blank	No	No	No	No	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of invalid votes (null/blank) between the 2018 and 2014 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. ‘Male (female) shock’ is \dot{L}_r^m (\dot{L}_r^f) and ‘white (nonwhite) shock’ is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Familia or PETI recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} null/blank’ is the change in the % of invalid votes (null/blank) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9 reports the counterfactual predictions. All predictions are weighted by the microregion’s share of total national valid votes in the 1st (column 1) or 2nd round (columns 2–4). We start with the first counterfactual exercise in column 1, which shows the linear prediction of Bolsonaro’s % of votes in the 1st round of the 2018 election at different quantiles of the male shock distribution.³² In the data, the *actual* (weighted) % of votes for Bolsonaro in the 1st round is 46.4%. Column 1 shows that setting the male shock at quantiles in the bottom half of the shock distribution has only a marginal effect on the predicted % of votes for Bolsonaro. For example, when we set the average male shock equal to the minimum, the % of votes for Bolsonaro decreases to 45.22%, a 1.18 ppt decline. Clearly, there is no realistic scenario in which a different magnitude of the male shock, within the observed range, would have resulted in Bolsonaro *losing* the 1st election round. Instead, column 1 shows that, for a male shock at the upper end of the distribution, the predicted % of votes for Bolsonaro gets very close to 50%, the value at which he would have been elected directly, without a runoff. Indeed, at the maximum observed male shock value, Bolsonaro would have become president in the 1st round, with 50.5% of votes.

Columns 2–4 report predicted % of Bolsonaro’s 2nd round votes for different values of the female shock. The *actual* (weighted) % of votes for Bolsonaro, in the 2nd round, is 55.3%. Column 2 shows that even setting the average female shock to its observed maximum would not suffice to overturn Bolsonaro’s victory: he would still achieve 51.4% of votes. The victory margin, in this case, would be narrower than in the highly competitive 2014 election, which Dilma won with 51.6% of votes.³³

As mentioned before, the male shock first-order stochastically dominates the female shock. Therefore, an interesting counterfactual is to ask what would be the election outcome if the female shock had the same distribution of the male shock. Column 3 shows predictions when quantiles of the *male* distribution are assigned to the female shock variable. If the female shock were larger than the 90th percentile of the male shock

³²Table A9 reports distribution quantiles for all shock variables.

³³For further comparison, in the 2016 Brexit referendum studied by Fetzer (forthcoming), Leave won with 51.89% of votes.

Table 9: Counterfactual shocks and election outcomes

		Bolsonaro, % of votes (predicted)				
1st round		2nd round				
Male shock at quantile:		Female shock at quantile:		Female shock at <i>male</i> quantile:		
	(1)		(2)		(3)	(4)
min	45.22 (0.60)	min	56.22 (0.59)	median	52.63 (1.30)	52.00 (1.47)
p10	45.32 (0.56)	p10	56.08 (0.53)	p75	51.25 (1.96)	50.63 (2.13)
p25	45.41 (0.53)	p25	55.98 (0.49)	p90	50.05 (2.53)	49.43 (2.70)
median	45.99 (0.37)	median	55.56 (0.36)	p99	48.14 (3.46)	47.52 (3.63)
p75	47.06 (0.47)	p75	54.79 (0.37)	<i>Male shock</i>	<i>On</i>	<i>Off</i>
p90	48.06 (0.83)	p90	53.87 (0.72)			
max	50.49 (1.86)	max	51.37 (1.90)			

Notes: Column 1 shows the linear prediction of Bolsonaro's % of votes in the 1st round of the 2018 election at different quantiles of the male shock distribution, based on the estimated OLS model of Table 6, Panel B, column 5. Columns 2–4 show the linear prediction of Bolsonaro's % of votes in the 2nd round of the election, based on OLS estimates from Table 6, Panel E, column 5. Column 2 shows predictions at different quantiles of the female shock distribution. Columns 3 and 4 show predictions when quantiles of the *male* distribution are assigned to the female shock variable, with the additional restriction, in column 4, of setting the male shock variable equal to zero, on average. Standard errors, calculated via the delta-method, shown in parentheses. All predictions are weighted by the microregion's share of total national valid votes in the 1st (column 1) or 2nd round (columns 2–4). The *actual* (weighted) % of votes for Bolsonaro in our data is 46.4%, in the 1st round, and 55.3%, in the 2nd round.

distribution, Bolsonaro would lose the presidential election to Haddad. In column 4, we re-do this exercise but introduce the additional restriction of shutting off the male shock effect, by setting it to zero, on average. In this scenario, not surprisingly, increasing the female shock over quantiles of the male shock distribution reduces the % of Bolsonaro votes even further. For a female shock at the 75th percentile of the male distribution, the % of Bolsonaro votes would be 50.6%, i.e., a victory margin of 1.2 ppts.

5 Mechanisms and robustness

We now investigate the role of crime as a potential mechanism or confounder and present further robustness checks.

Crime During the economic crisis, Brazil experienced a substantial increase in violent crime. We collect administrative homicide data from mortality records and assign crimes to microregions by place of death.³⁴ From 2013 to 2017, homicides went up from 56,689 to 63,634—a 12% increase. The vast majority of victims are nonwhite men—71% of all victims, in 2017. Throughout his political career, Bolsonaro has defended a tough-on-crime stance, including, for example, explicit support for extrajudicial killings of criminal suspects and a proposal to liberalize gun ownership laws. Crime was a particular salient feature of the 2018 presidential campaign, and Bolsonaro’s tough-on-crime views became symbolized by his celebratory ‘finger-gun’ hand gesture (at rallies, congressional sessions, and other public events) of pretending to hold and shoot an imaginary rifle. Therefore, we want to test whether the increase in crime is explained by the labor demand shock, and, in turn, whether the shock effects on electoral outcomes are robust to controlling for crime levels and trends.

Table 10 shows estimates for the usual regression specification (equation 3), but with the outcome variables being the log difference in homicide rate (homicides per 100,000 inhabitants) between 2017 and 2013, by gender of the victim.³⁵ For male victims (panels A-C), columns 1 and 2 suggest that an increase in the overall shock (panel A), the male shock (panel B), and the nonwhite shock (panel C) significantly increase the change in crime rates. However, all the shock coefficients become statistically insignificant once socio-demographic controls are included (columns 3-5). The evidence for homicides of women shows the same pattern (panels D-F). Overall, we find no evidence supporting the

³⁴Data are compiled by the Brazilian Ministry of Health, in the DATASUS system (*Departamento de Informática do Sistema Único de Saúde*). For Brazil, [Dix-Carneiro et al. \(2018\)](#) show that homicide rates are a good approximation for overall crime. As in their paper, we code homicides as all deaths in categories X85-Y09 of the International Statistical Classification of Diseases and Related Health Problems (ICD-10).

³⁵Homicide data for 2018 are not yet available. In 2017, 92% of homicide victims were male. We normalize homicide numbers by 100,000 inhabitants using yearly population estimates by municipality provided by IBGE. As in [Dix-Carneiro et al. \(2018\)](#), we compute $\log(\text{crime rate} + 1)_t$, to avoid losing microregions where no homicides occurred at time t . In addition, for a few microregions with missing values in either 2013 or 2017, we assign the values for the closest year. For example, in the case of homicides of men, 8 microregions have missing values in 2017 or 2013. For 2 microregions with missing 2017 data, we assign the values of 2016; for 4 microregions with missing 2013 data, we assign the values of 2012; for 1 microregion with missing 2013 and 2012 data, we assign the value of 2014; and, finally, for 1 microregion with missing 2017 and 2013 data, we use the 2016 and 2012 values. We perform similar adjustments for homicides of women.

view that microregions where the average resident, or a particular subgroup, was hit harder by the labor demand shock experienced an increase in crime rates relative to pre-crisis levels.³⁶

While the results of Table 10 suggest that crime is not a transmission mechanism for the effect of economic shocks on electoral outcomes, it could still be the case that crime is confounding that effect. We test this hypothesis in Table 11. We model the percentage point change in votes for PT and Bolsonaro with augmented specifications that sequentially introduce as control variables the homicide rate of men in 2012 and the log difference in homicides rates of men between 2017 and 2013. Column 1 replicates the baseline model of equation (3); column 2 controls for pre-crisis crime levels; column 3 further controls for the change in crime rates. In addition, we also test for the robustness of our estimates to the inclusion of lagged (2014–10) percentage point changes in abstention rates and invalid votes (column 4). Column 5 introduces all controls simultaneously.

Starting with percentage point change in PT votes, for both election rounds (panels A and B), we find that the effects of the gender-specific shocks are qualitatively similar across all columns, although the absolute magnitude of the female shock is somewhat reduced in the 2nd round (panel B). The estimated effects of the crime variables are consistent with the view that Bolsonaro’s tough-on-crime rhetoric may have earned him political dividends. The more violent a microregion was in 2012, and the larger its increase in crime rates between 2013 and 2017, the larger the loss in votes for PT between 2014 and 2018.

Turning to the % of votes for Bolsonaro, we find that the gender shock effects in the 1st round are a bit less robust to the introduction of the new controls, particularly in column 5. For the 2nd round, however, we still find a marginally significant positive effect of the male shock and a marginally significant negative effect of the female shock, even when all controls are added simultaneously (column 5). Interestingly, the estimates for the crime variables suggest that Bolsonaro performed particularly well in microregions that already had high pre-crisis homicides rates. However, there is no additional significant

³⁶In this respect, our results differ from [Dix-Carneiro *et al.* \(2018\)](#), who find that, across microregions, the labor market shock caused by the 1988–1995 trade liberalization process increased homicide rates between 1996 and 2003, but not afterwards.

Table 10: Change in homicide rate, 2017–2013

$\Delta_{17-13} \log(\text{Crime rate}): \text{male victims}$					
<i>Panel A: Overall shock</i>	(1)	(2)	(3)	(4)	(5)
Shock (overall)	0.7174*** (0.1125)	0.5764*** (0.1337)	0.2706 (0.2740)	0.3269 (0.2772)	0.3268 (0.2779)
<i>Panel B: Shock by gender</i>	(1)	(2)	(3)	(4)	(5)
Male shock	1.1153*** (0.2819)	1.1049*** (0.3487)	0.4079 (0.4214)	0.4409 (0.4365)	0.4424 (0.4372)
Female shock	-0.1716 (0.5356)	-0.6179 (0.6818)	-0.0500 (0.7260)	0.0680 (0.7482)	0.0622 (0.7542)
<i>Panel C: Shock by race</i>	(1)	(2)	(3)	(4)	(5)
White shock	0.4914 (0.3037)	0.6051 (0.3892)	0.4145 (0.5233)	0.5830 (0.5318)	0.5830 (0.5324)
Nonwhite shock	0.8029*** (0.1562)	0.5594** (0.2331)	0.1736 (0.3701)	0.1579 (0.3778)	0.1571 (0.3773)
$\Delta_{17-13} \log(\text{Crime rate}): \text{female victims}$					
<i>Panel D: Overall shock</i>	(1)	(2)	(3)	(4)	(5)
Shock (overall)	0.3673*** (0.0997)	0.3985*** (0.1216)	0.3419 (0.2852)	0.3290 (0.2849)	0.3363 (0.2835)
<i>Panel E: Shock by gender</i>	(1)	(2)	(3)	(4)	(5)
Male shock	0.3947 (0.2863)	0.3416 (0.3563)	0.2051 (0.4721)	0.1485 (0.4883)	0.1239 (0.4933)
Female shock	0.3063 (0.5826)	0.5257 (0.7229)	0.6556 (0.9220)	0.7345 (0.9258)	0.8169 (0.9332)
<i>Panel F: Shock by race</i>	(1)	(2)	(3)	(4)	(5)
White shock	0.3659 (0.2684)	0.4204 (0.3432)	0.2814 (0.4784)	0.4517 (0.5039)	0.4528 (0.5042)
Nonwhite shock	0.3678** (0.1481)	0.3855* (0.2288)	0.3833 (0.3961)	0.2464 (0.4134)	0.2577 (0.4117)
<i>Control variables in all panels:</i>					
State-specific trends	No	Yes	Yes	Yes	Yes
Socio-demographics	No	No	Yes	Yes	Yes
Election 2010	No	No	No	Yes	Yes
Δ_{14-10} Dilma, % of votes	No	No	No	No	Yes

Notes: $N = 557$ (Panels A-C); $N = 531$ (Panels D-F). OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the log difference in crime rates (homicides per 100,000 inhabitants) between 2017 and 2013 by gender of the victim: male victims shown in Panels A-C, female victims shown in Panels D-F. ‘Male (female) shock’ is \dot{L}_r^m (\dot{L}_r^f) and ‘white (nonwhite) shock’ is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETI recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} Dilma, % of votes’ is the change in the % of votes for Dilma (PT) between the 2014 and 2010 elections, 1st round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 11: Change in voting outcomes: shock by gender. Robustness checks.

	Δ_{18-14} PT, % of votes				
<i>Panel A: 1st round</i>	(1)	(2)	(3)	(4)	(5)
Male shock	-10.2338*** (3.1059)	-10.2868*** (3.0486)	-9.9993*** (3.0656)	-10.1364*** (3.1519)	-9.8457*** (3.1196)
Female shock	24.9837*** (5.7282)	25.1326*** (5.6160)	24.9872*** (5.5755)	24.8533*** (5.7244)	24.7178*** (5.5797)
Crime rate: men, 2012		-0.0286** (0.0145)	-0.0351** (0.0150)		-0.0354** (0.0151)
Δ_{17-13} log(Crime rate): men			-0.6513* (0.3457)		-0.6513* (0.3501)
Δ_{14-10} abstention, %: 1st round				0.0306 (0.0935)	-0.0218 (0.0822)
Δ_{14-10} null/blanks, %: 1st round				0.0567 (0.1784)	0.0430 (0.1725)
<i>Panel B: 2nd round</i>	(1)	(2)	(3)	(4)	(5)
Male shock	-5.6310 (3.6198)	-4.4407 (3.4274)	-4.0613 (3.3676)	-5.9922 (3.6430)	-4.1747 (3.3987)
Female shock	20.8310*** (6.9552)	16.3846** (6.6061)	16.1804** (6.4385)	20.6820*** (6.9801)	15.9842** (6.4893)
Crime rate: men, 2012		-0.0661*** (0.0166)	-0.0745*** (0.0164)		-0.0723*** (0.0166)
Δ_{17-13} log(Crime rate): men			-0.8340** (0.4158)		-0.8446** (0.4139)
Δ_{14-10} abstention, %: 2nd round				0.0935 (0.0780)	0.1026 (0.0722)
Δ_{14-10} null/blanks, %: 2nd round				-0.3121 (0.3658)	-0.1379 (0.3561)
	<i>Bolsonaro, % of votes</i>				
<i>Panel C: 1st round</i>	(1)	(2)	(3)	(4)	(5)
Male shock	8.7450** (3.8550)	7.9321** (3.7008)	7.7862** (3.6931)	7.0178* (3.9061)	5.8942 (3.7384)
Female shock	-15.6799** (7.5242)	-12.4582* (7.3440)	-12.3844* (7.3171)	-12.9839* (7.6455)	-9.3617 (7.4089)
Crime rate: men, 2012		0.0448** (0.0180)	0.0481*** (0.0181)		0.0499*** (0.0181)
Δ_{17-13} log(Crime rate): men			0.3307 (0.4379)		0.3930 (0.4333)
Δ_{14-10} abstention, %: 1st round				-0.0798 (0.0804)	-0.0419 (0.0781)
Δ_{14-10} null/blanks, %: 1st round				-0.7011*** (0.2621)	-0.7156*** (0.2568)
<i>Panel D: 2nd round</i>	(1)	(2)	(3)	(4)	(5)
Male shock	6.7982* (3.5342)	6.1074* (3.4210)	5.8108* (3.3829)	7.2969** (3.5617)	6.0338* (3.4201)
Female shock	-16.9783** (7.1497)	-13.7993** (6.8797)	-13.6396** (6.7762)	-16.7821** (7.1687)	-13.3648* (6.8232)
Crime rate: men, 2012		0.0515*** (0.0170)	0.0581*** (0.0170)		0.0546*** (0.0169)
Δ_{17-13} log(Crime rate): men			0.6521 (0.4193)		0.6652 (0.4162)
Δ_{14-10} abstention, %: 2nd round				-0.1544** (0.0704)	-0.1439* (0.0733)
Δ_{14-10} null/blanks, %: 2nd round				0.3808 (0.3711)	0.2664 (0.3633)
	<i>Control variables in all panels:</i>				
State-specific trends/dummies	Yes	Yes	Yes	Yes	Yes
Socio-demographics	Yes	Yes	Yes	Yes	Yes
Election 2010	Yes	Yes	Yes	Yes	Yes
Δ_{14-10} Dilma, % of votes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	558	554	554	558	554

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variables are: the change in the % of votes for PT (Workers' Party) between the 2018 and 2014 elections, either in the 1st (Panel A) or 2nd (Panel B) round; and the % of votes for Jair Bolsonaro (PSL) in the 2018 election, either in the 1st (Panel C) or 2nd (Panel D) round. 'Male (female) shock' is \tilde{L}_r^m (\tilde{L}_r^f) and 'white (nonwhite) shock' is \tilde{L}_r^w (\tilde{L}_r^{nw}), as defined in equation (2). 'Overall shock' is $\tilde{L}_r = \tilde{L}_r^m + \tilde{L}_r^f$. 'Crime rate: men, 2012' is homicides per 100,000 inhabitants (male victims only), in 2012. ' Δ_{17-13} log(Crime rate): men' is the log difference in male crime rates between 2017 and 2013. ' Δ_{14-10} abstention, %', ' Δ_{14-10} null/blanks, %', and ' Δ_{14-10} Dilma, % of votes' are, respectively, the change in % of abstention, % of invalid votes (null/blank), and % of votes for Dilma (PT) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels B-D) round. 'Socio-demographics' refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETI recipients, and share employed in construction sector (1-digit). 'Election 2010' are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

effect of increasing crime rates during the 2013–17 crisis period.

Finally, we estimate similar models for the abstention and invalid votes outcome variables (Table A10). The results show that the negative effect of the female shock on abstention rates in both rounds and on invalid votes in the 2nd round is robust (both in statistical significance and in coefficient magnitude) to the augmented specifications. None of the crime variables is significant at conventional levels, except for a positive and significant effect of the 2017–13 change in crime rates on the percentage point change of null/blank votes in the 2nd election round (panel E, Table A10).

In sum, we find that rising crime rates are neither a mechanism nor a confounder for the gender-specific economic shocks. Instead, while crime played a significant role in galvanizing support for Bolsonaro, this effect is independent from the gender-shock effects.

Further robustness checks We conduct several additional robustness checks. First, we rerun our preferred specification of equation (3) with each microregion weighted by its 2010 share of the total national population (Table A11, column 2). Then, in column 3, we replace the state-specific trends with mesoregion-specific trends. Mesoregions are statistical areas defined by IBGE, whose size lies between a microregion and a federal state. There are 137 mesoregions (compared with 27 states). A regression of the percentage point change of PT votes on mesoregion-specific trends alone has an R^2 of 0.87, in the 1st round.³⁷ For brevity, Table A11 only present estimates for the 1st election round.

For the change in PT votes (panels A-C), the population-weighted regressions produce similar null effects for the overall and race-specific shocks. The gender-specific shock effects (positive for male shock; negative for female shock) are even larger in absolute magnitude and still highly statistical significant. When absorbing mesoregion-specific trends, the direction of the gender-specific shocks is the same and both remain statistically significant, although their absolute magnitudes decrease, when compared with the baseline specification with state-specific trends.

For the % of votes for Bolsonaro (panels D-F), population-weighted estimates differ in

³⁷For the 2nd round, the R^2 is 0.76.

several directions (column 2). First, the positive coefficient on the overall shock becomes marginally significant. Second, the magnitude of the positive (and significant) male shock effect increases, whereas the (absolute) magnitude of the female shock effect decreases, becoming statistically insignificant. Lastly, among the race-specific shocks, we now find a large and highly significant positive effect for the nonwhite shock variable (still, null effects for the white shock). According to the population-weighted estimates, a one SD increase in the nonwhite shock increased votes for Bolsonaro by 1.5 ppts (12.0029×0.13).³⁸ When we replace state-specific trends by mesoregion-specific trends (column 3), all shock coefficients become statistically insignificant, although the signs of the gender- and race-specific shocks do not change. This result is not surprising, because the mesoregion-specific trends absorb nearly all of the variation across microregions. Regressing the % of votes for Bolsonaro on mesoregion dummies *alone* gives an R^2 of 0.91 (1st round) and 0.92 (2nd round). In column 4, we replace the outcome variable by computing the percentage point change between Bolsonaro’s votes in 2018 and Levy Fidelix’s in 2014. This outcome variable captures the percentage point change in far-right votes, since Fidelix (PRTB) was the far-right candidate in 2014 (and 2010).³⁹ However, because, in the average microregion, Fidelix obtained only 0.43% of the 1st round votes in 2014, all point estimates for the shock variables are virtually identical (up to the second decimal case) to the baseline model. In other words, before 2018, the far-right had virtually no electoral support in Brazilian presidential elections (see, also, Figure A6).

We next allow for more conservative standard error estimates. In Tables A12-A15, we re-estimate our baseline specifications but increase the geographical level of aggregation at which standard errors are clustered. We move from the baseline 558 microregion-clusters (column 1) to 137 mesoregion-clusters (column 2), and to 27 state-clusters (column 3). For models on the percentage point change in PT votes (Table A12), the percentage point change in abstention (Table A14), and the percentage point change in null/blank votes

³⁸Here, the SD deviation of the nonwhite shock is also population-weighted. The unweighted SD is very similar, at 0.14.

³⁹Levy Fidelix did not run in the 2018 election, because his party, PRTB, ran in a coalition with Bolsonaro and fielded his running mate, the current vice-president, retired General Hamilton Mourão.

(Table A15), all shock effects that were significant at least at the 5% level with microregion-clusters are still statistically significant at least at the 10% level with state-clusters. For models on the % of votes for Bolsonaro (Table A13), the gender-specific shock effects are still significant with mesoregion-clusters, but become insignificant with state-clusters.

Lastly, we conduct a falsification test. We regress the lagged change in PT votes on the shock variables. The idea is that future shocks (2013–2018) should not significantly affect past election results (change in Dilma’s votes from 2010 to 2014), unless they correlate with unobservable pre-trends in political preferences. Indeed, in Table A16, none of the shock variables significantly predicts lagged changes in PT votes. However, the sign of the gender-specific effects is similar to that of the main regressions on 2018–14 PT vote change: positive for the male shock, and negative for the female shock. This (insignificant) pre-trend is another reason why we always control for the lagged change in PT votes in our preferred specifications for PT and Bolsonaro electoral outcomes.

Overall, these sensitivity checks indicate that our main findings are qualitatively robust.

6 Conclusion

Brazil’s virtuous cycle of economic growth, declining poverty, and falling inequality came to an end in 2014, with the onset of a severe economic recession. This article investigates the consequences of this economic shock for the election of far-right Jair Bolsonaro, in October 2018. We argue that rather than the overall shock itself, its heterogeneous effect by gender plays a key role in explaining the victory of Bolsonaro. More specifically, we hypothesize that men and women react differently to the labor demand shock, when confronted with the prospect of Bolsonaro’s election. Bolsonaro’s authoritarian, tough-on-crime, populist, and sexist rhetoric may be appealing to men who, due to the economic shock, experience a relative loss in traditional masculine, breadwinner-type social identity. For women, however, the grievances activated by the economic shock should make this rhetoric particularly unattractive.

Consistent with these hypotheses, we find evidence that, in locations where the shock

hits men harder, Bolsonaro obtains a higher percentage of votes. In sharp contrast, in regions where the shock hits women harder, there is a reduction in: (1) % of votes for Bolsonaro, (2) abstention, and (3) null/blank votes. Interestingly, we do not find similar effects for the race-specific shocks. This supports the interpretation that gender was an important dimension of Bolsonaro’s polarizing effect.

Although the aggregation of the electoral outcomes by microregion is a clear limitation of our paper—since we cannot pin down whether the gender and race specific shocks affected voting behavior of the respective groups—, we try to disentangle the effects in a number of ways. We take a closer look at criminality, but conclude that rising violent crime is neither a mechanism nor a confounder of the gender-specific shocks. Additionally, the argument that rising crime boosts support for Bolsonaro could not explain the gender patterns that we find. Existing evidence suggests that women have higher levels of anxiety and fear about crime (e.g., Sutton and Farrall, 2004; Fox *et al.*, 2009) and would, therefore, be *more* susceptible to Bolsonaro’s tough-on-crime rhetoric. Similarly, when thinking about the role of corruption in explaining the election of Bolsonaro, we would expect the gender effects to run in the opposite direction. For instance, existing empirical evidence shows that women are not only less corrupt themselves (Swamy *et al.*, 2001; Brollo and Troiano, 2016), but also less tolerant toward corruption (Alatas *et al.*, 2009). Therefore, we would predict women’s behavior to be less supportive for PT, due to the party’s involvement in the *Lava Jato* scandal. Overall, despite the fact that we cannot solve the ‘ecological fallacy’, we are confident that our results are not entirely driven by alternative explanations.

This paper contributes to the literature by assessing empirically how economic shocks shortly before consequential elections can have important, and highly heterogeneous, effects at the ballot box. In line with Ballard-Rosa *et al.* (2019), we provide evidence that economic shocks that threaten the relative status of males, a traditionally dominant group, might give rise to political extremism.

We highlight three main conclusions associated with our results. First, on the demand-side, social protection and economic assistance may be effective policy tools in reducing

vulnerability to economic shocks and deterring political polarization. Second, on the supply-side, solid democratic institutions (media, judiciary, public bureaucracy, etc) could help reducing the scope of action of extreme politicians, both during electoral campaigns and throughout their political mandates. Third, policymakers and academics should take into account, in their analyses, rigid social norms of masculinity that are typically centered around men's economic status and might be reflected in extreme political choices.

In the future, a better understanding of the exact mechanisms linking shocks, gender identity, and political preferences can help designing public policies that mitigate the appeal of candidates at the extremes of the political spectrum and ensure well-functioning democratic systems.

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Online Appendix

#EleNão: Economic crisis, the political gender gap,
and the election of Bolsonaro

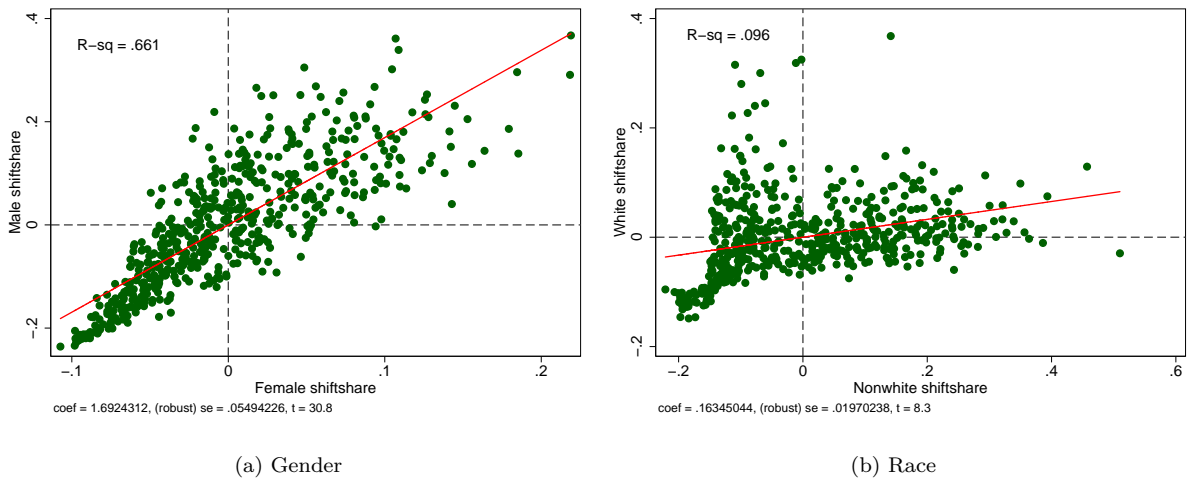


Figure A1: Linear correlation between shocks, by gender and race

Notes: Male (female) shock is \dot{L}_r^m (\dot{L}_r^f), and white (nonwhite) shock is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2).

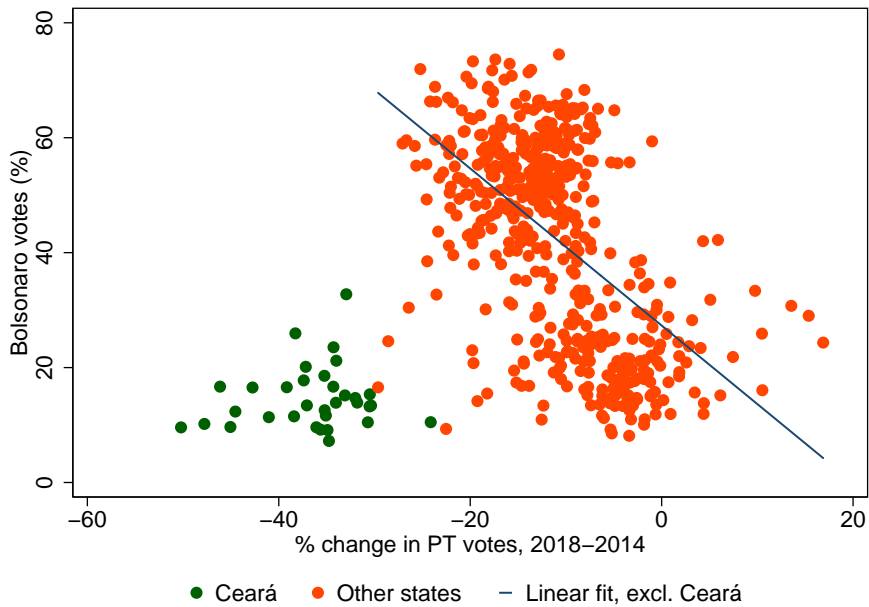


Figure A2: Bolsonaro, % votes vs. PT votes, percentage point change 2018–2014, 1st round

Notes: The first round in Ceará was won by the home candidate, Ciro Gomes (PDT). Own calculations from TSE.

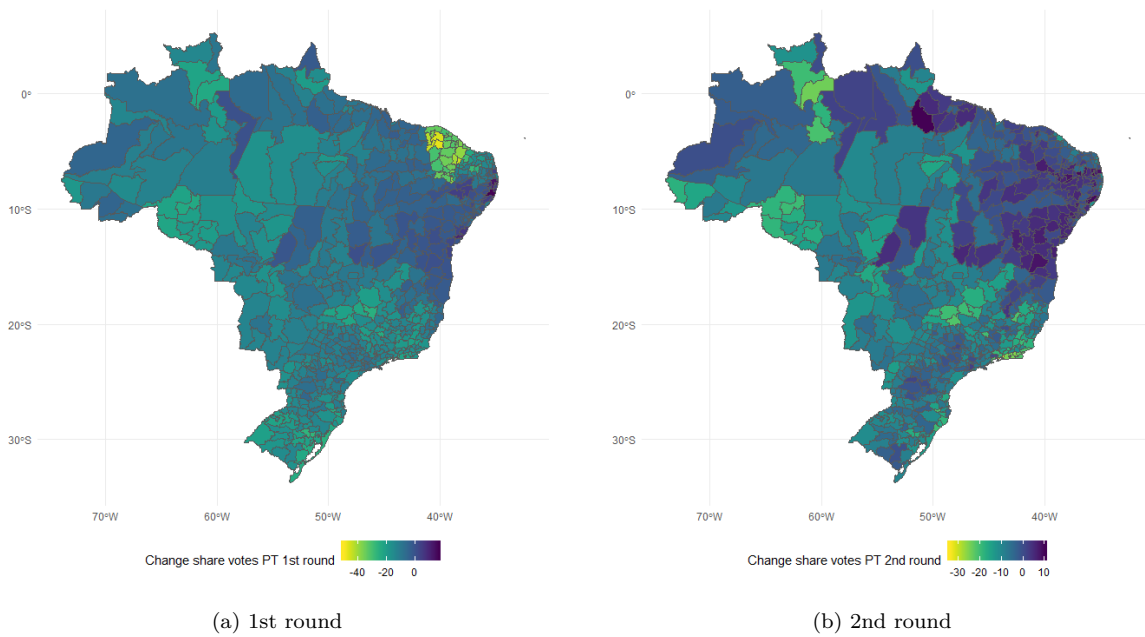


Figure A3: Percentage point change in PT votes, 2018–2014, by microregion

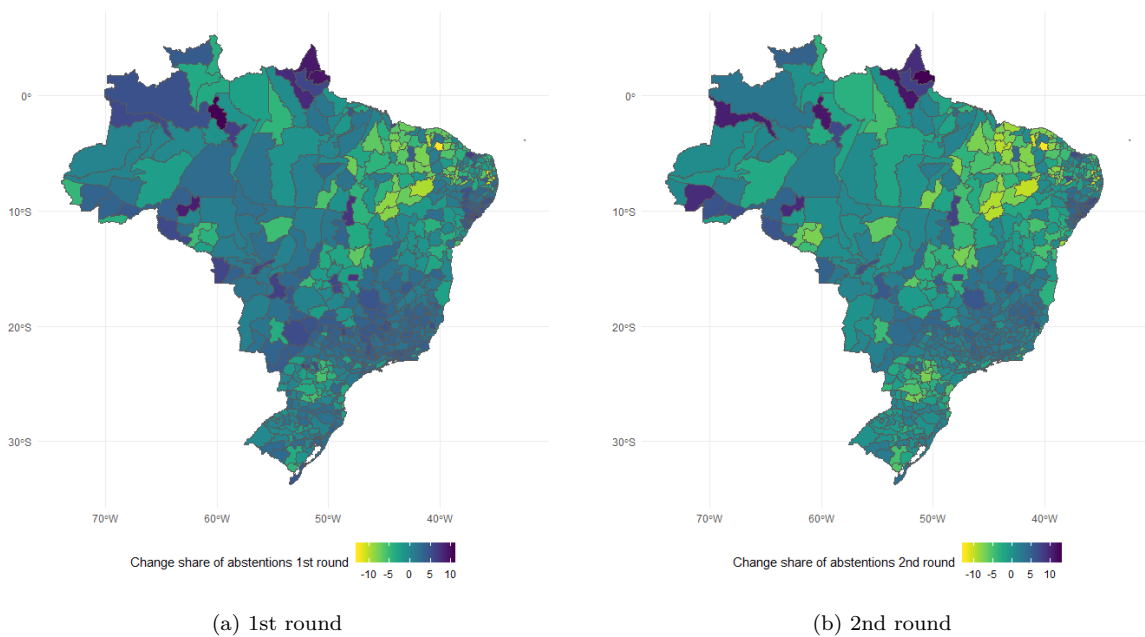


Figure A4: Percentage point change in abstention rate, 2018–2014, by microregion

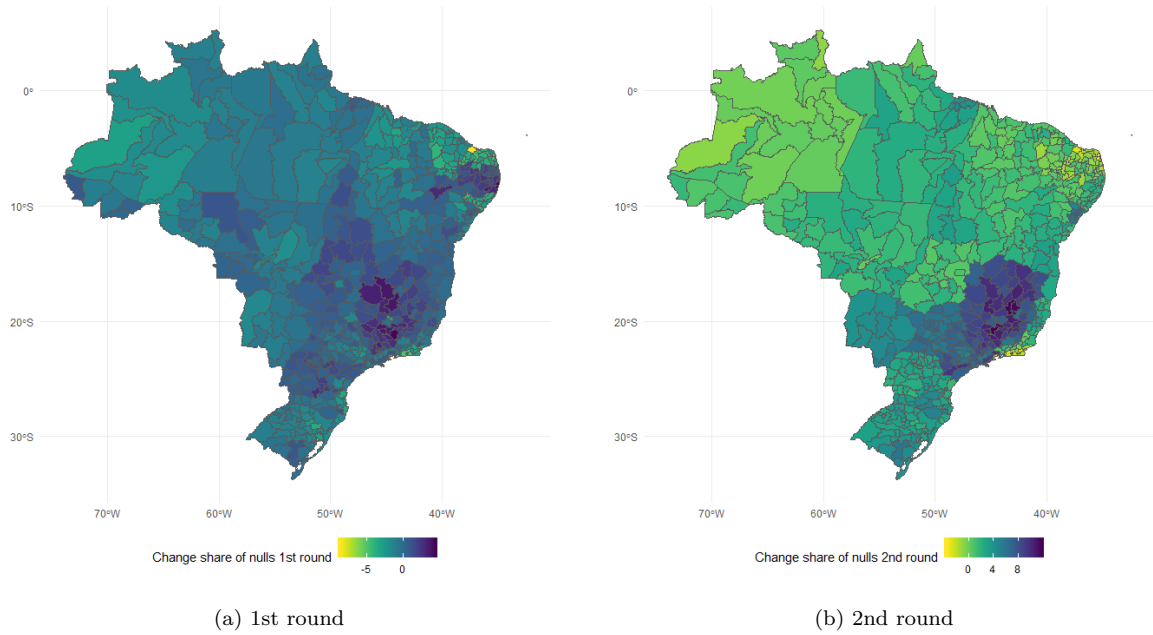


Figure A5: Percentage point change in invalid votes (null/blank), 2018–2014, by microregion

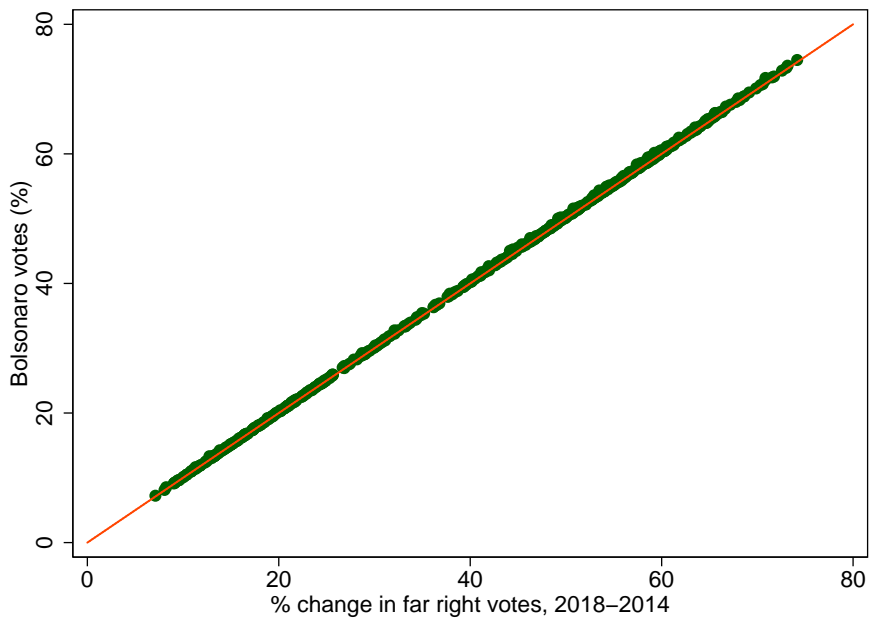


Figure A6: Bolsonaro, % votes vs. Far-right votes, percentage point change 2018–2014

Notes: Far-right gain is calculated as the difference in percentage votes between Jair Bolsonaro (PSL, 1st round in 2018) and Levy Fidelix (PRTB, 1st round in 2014). Own calculations from TSE.

Table A1: Change in PT votes: shock by gender, 1st round. Full table

	Δ_{18-14} PT, % of votes: 1 round				
	(1)	(2)	(3)	(4)	(5)
Male shock	-14.6419** (5.9255)	6.2607* (3.5132)	-5.5490 (3.9018)	-7.2636* (3.8578)	-10.2338*** (3.1059)
Female shock	53.3173*** (10.2534)	7.0929 (7.5573)	8.1099 (7.1569)	12.8809* (6.8179)	24.9837*** (5.7282)
Employment share			-11.2060** (5.1173)	-8.2512 (5.1120)	-14.6517*** (4.0643)
Male pop. share			47.1447** (19.7835)	57.6988*** (19.7568)	34.6029** (16.9008)
Nonwhite pop. share			16.0708*** (2.5704)	17.6272*** (2.8548)	22.5532*** (2.6922)
<i>Education attainment (Ref. = < primary)</i>					
Primary			-38.3896*** (14.4306)	-32.8126** (15.9133)	-31.3843*** (11.3648)
Secondary			-0.5362 (8.4576)	3.9128 (9.1558)	4.8720 (8.0095)
Tertiary			14.8845 (11.9921)	16.9891 (12.1541)	29.2375*** (10.6784)
Bolsa Familia recipients			1.5154 (12.4414)	23.2974* (13.2191)	56.7965*** (12.1342)
Construction share			-15.8125 (21.9315)	-16.1373 (22.8230)	-20.7505 (20.6936)
<i>Votes 2010 (Ref. = Dilma (PT))</i>					
Serra (PSDB)				0.1317*** (0.0273)	0.3160*** (0.0273)
Marina (PV)				0.1920*** (0.0612)	0.1809*** (0.0553)
Fidelix (PRTB)				-3.6146 (6.8927)	-7.2422 (5.4787)
Other				-1.3732 (1.2541)	-1.1127 (1.2242)
Null/blank				0.6160*** (0.1618)	0.2633* (0.1477)
Abstention				-0.0606 (0.0820)	-0.0434 (0.0728)
Δ_{14-10} Dilma, % of votes: 1 round					-0.5615*** (0.0415)
State-specific trends	No	Yes	Yes	Yes	Yes
N	558	558	558	558	558
R^2	0.047	0.796	0.833	0.847	0.888
adj. R^2	0.043	0.785	0.822	0.834	0.879

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of votes for PT (Workers' Party) between the 2018 and 2014 elections, 1st round. 'Male (female) shock' is L_r^m (L_r^f), as defined in equation (2). For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2: Change in PT votes: shock by gender, 2nd round. Full table

	Δ_{18-14} PT, % of votes: 2 round				
	(1)	(2)	(3)	(4)	(5)
Male shock	11.6519*** (3.5853)	11.0780*** (3.8125)	-0.7923 (3.8138)	-2.6233 (3.9091)	-5.6310 (3.6198)
Female shock	41.2143*** (7.7419)	25.8049*** (7.9526)	11.0427 (7.6648)	14.1471* (7.5619)	20.8310*** (6.9552)
Employment share			-3.4866 (5.3694)	-2.9904 (5.1214)	-10.8152** (5.0984)
Male pop. share			-17.2776 (21.3680)	-1.7268 (21.0055)	-9.8566 (20.4974)
Nonwhite pop. share			1.7667 (2.5748)	5.9720** (2.7102)	10.0463*** (2.5930)
<i>Education attainment (Ref. = < primary)</i>					
Primary			-32.1448** (16.3399)	-20.0456 (15.1385)	-18.9852 (16.5394)
Secondary			-20.3722** (8.5803)	-8.6431 (9.7357)	-6.0590 (9.1659)
Tertiary			30.0388** (14.4695)	35.1273** (13.8362)	42.0473*** (13.4276)
Bolsa Familia recipients			45.9733*** (12.3693)	61.6423*** (12.9183)	79.5408*** (12.5071)
Construction share			-14.1045 (20.0844)	-12.6736 (19.2310)	-16.1744 (19.5741)
<i>Votes 2010 (Ref. = Dilma (PT))</i>					
Serra (PSDB)				0.1458*** (0.0322)	0.2859*** (0.0315)
Marina (PV)				-0.0159 (0.0691)	-0.0823 (0.0647)
Fidelix (PRTB)				4.6825 (8.8466)	0.4439 (8.9698)
Other				1.1820 (1.2862)	1.6330 (1.2816)
Null/blank				0.6800*** (0.1654)	0.4240*** (0.1618)
Abstention				-0.0229 (0.0782)	-0.0102 (0.0756)
Δ_{14-10} Dilma, % of votes: 2 round					-0.4086*** (0.0462)
State-specific trends	No	Yes	Yes	Yes	Yes
N	558	558	558	558	558
R^2	0.266	0.658	0.708	0.735	0.773
adj. R^2	0.264	0.640	0.688	0.713	0.754

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of votes for PT (Workers' Party) between the 2018 and 2014 elections, 2nd round. 'Male (female) shock' is L_T^m (L_T^f), as defined in equation (2). For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Bolsonaro vote share: shock by gender, 1st round. Full table

	Bolsonaro, % of votes: 1 round				
	(1)	(2)	(3)	(4)	(5)
Male shock	-43.1637*** (9.8623)	-14.6606** (6.1914)	13.5211*** (4.7652)	11.3735*** (4.2351)	8.7450** (3.8550)
Female shock	-113.4544*** (20.9204)	-71.3596*** (13.5134)	-41.9803*** (9.8879)	-26.3906*** (8.3491)	-15.6799** (7.5242)
Employment share			12.0237 (7.9095)	18.6692*** (6.8827)	13.0049** (5.8368)
Male pop. share			29.3277 (28.8330)	32.8917 (25.5050)	12.4523 (23.3984)
Nonwhite pop. share			-20.5965*** (3.4706)	-15.0137*** (3.0627)	-10.6542*** (2.8410)
<i>Education attainment (Ref. = < primary)</i>					
Primary			35.8785 (28.9592)	37.3918 (27.0876)	38.6558* (21.3688)
Secondary			-0.8036 (10.7922)	-2.3757 (10.0832)	-1.5268 (9.7112)
Tertiary			-17.3123 (18.2938)	-18.8037 (16.9042)	-7.9641 (15.7528)
Bolsa Familia recipients			-156.5888*** (14.5946)	-91.0947*** (14.9520)	-61.4486*** (13.4591)
Construction share			13.4780 (30.1491)	15.0136 (29.8012)	10.9310 (25.0233)
<i>Votes 2010 (Ref. = Dilma (PT))</i>					
Serra (PSDB)				0.4663*** (0.0334)	0.6294*** (0.0324)
Marina (PV)				0.6316*** (0.0704)	0.6218*** (0.0651)
Fidelix (PRTB)				-1.0706 (13.9623)	-4.2809 (12.8270)
Other				-2.9768* (1.5476)	-2.7463** (1.3404)
Null/blank				0.0948 (0.2154)	-0.2173 (0.1874)
Abstention				0.0273 (0.0855)	0.0425 (0.0790)
Δ_{14-10} Dilma, % of votes: 1 round					-0.4969*** (0.0531)
State dummies	No	Yes	Yes	Yes	Yes
N	558	558	558	558	558
R^2	0.389	0.855	0.926	0.951	0.959
adj. R^2	0.387	0.847	0.921	0.947	0.956

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of votes for Jair Bolsonaro (PSL) in the 2018 election, 1st round. ‘Male (female) shock’ is \hat{L}_r^m (\hat{L}_r^f), as defined in equation (2). For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Bolsonaro vote share: shock by gender, 2nd round. Full table

	Bolsonaro, % of votes: 2 round				
	(1)	(2)	(3)	(4)	(5)
Male shock	-55.7785*** (10.7642)	-19.4870*** (6.7320)	11.7315** (4.8453)	10.9399*** (4.0253)	6.7982* (3.5342)
Female shock	-126.9415*** (23.4887)	-71.1853*** (14.9379)	-42.1159*** (10.4963)	-26.1821*** (8.2512)	-16.9783** (7.1497)
Employment share			15.5591** (7.9144)	23.2119*** (6.2345)	12.4371** (5.0123)
Male pop. share			28.5928 (30.0605)	39.6334 (24.3041)	28.4386 (20.1580)
Nonwhite pop. share			-27.4323*** (3.6724)	-18.4078*** (3.0212)	-12.7975*** (2.6534)
<i>Education attainment (Ref. = < primary)</i>					
Primary			26.9466 (25.4695)	31.2647 (21.2718)	32.7248** (16.5154)
Secondary			3.5314 (11.6649)	-1.5604 (9.9556)	1.9980 (9.0651)
Tertiary			-32.2347* (18.8451)	-37.1567** (15.6370)	-27.6278** (13.2796)
Bolsa Familia recipients			-170.3481*** (15.4813)	-89.8568*** (14.7069)	-65.2104*** (12.5462)
Construction share			19.1302 (27.8833)	21.2436 (24.1254)	16.4230 (20.1975)
<i>Votes 2010 (Ref. = Dilma (PT))</i>					
Serra (PSDB)				0.5841*** (0.0324)	0.7770*** (0.0307)
Marina (PV)				0.7287*** (0.0695)	0.6372*** (0.0615)
Fidelix (PRTB)				2.5818 (12.0679)	-3.2548 (10.0304)
Other				-0.8715 (1.4269)	-0.2505 (1.1808)
Null/blank				0.0192 (0.1970)	-0.3333** (0.1682)
Abstention				0.0420 (0.0842)	0.0595 (0.0753)
Δ_{14-10} Dilma, % of votes: 2 round					-0.5626*** (0.0466)
State dummies	No	Yes	Yes	Yes	Yes
N	558	558	558	558	558
R^2	0.408	0.871	0.938	0.966	0.974
adj. R^2	0.406	0.864	0.934	0.963	0.972

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of votes for Jair Bolsonaro (PSL) in the 2018 election, 2nd round. 'Male (female) shock' is \hat{L}_r^m (\hat{L}_r^f), as defined in equation (2). For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Change in abstention rate: shock by gender, 1st round. Full table

	Δ_{18-14} abstention, %: 1 round				
	(1)	(2)	(3)	(4)	(5)
Male shock	-7.2165*** (2.0668)	-1.4450 (2.2465)	2.6804 (2.9363)	2.8038 (3.0156)	4.1058 (2.7256)
Female shock	-9.2043* (4.7966)	-10.2443** (4.5691)	-11.5453** (5.3202)	-11.7892** (5.4821)	-14.5382*** (4.8255)
Employment share			7.2485** (3.4302)	6.0474* (3.4325)	3.8261 (3.3094)
Male pop. share			-8.0909 (13.9811)	-15.6491 (14.1783)	-9.7500 (12.2970)
Nonwhite pop. share			0.9369 (1.4453)	1.3868 (1.6631)	2.0849 (1.5358)
<i>Education attainment (Ref. = < primary)</i>					
Primary			-8.4468 (8.5210)	-8.3560 (8.9543)	5.0174 (8.1153)
Secondary			-0.5729 (5.5009)	-2.8866 (6.0147)	-5.1462 (5.2699)
Tertiary			-7.0698 (9.7928)	0.5229 (9.8969)	4.2169 (7.9947)
Bolsa Familia recipients			-20.8238** (8.1614)	-19.6992** (8.9021)	-15.0513* (7.7945)
Construction share			-6.8747 (12.9626)	-0.1727 (13.0352)	-5.4963 (11.5576)
<i>Votes 2010 (Ref. = Dilma (PT))</i>					
Serra (PSDB)				-0.0116 (0.0197)	-0.0070 (0.0163)
Marina (PV)				-0.0512 (0.0465)	-0.0693* (0.0388)
Fidelix (PRTB)				-0.9591 (4.6935)	-3.2784 (3.8630)
Other				-1.0168 (0.8151)	-1.2522* (0.7014)
Null/blank				-0.1218 (0.1190)	0.0356 (0.1025)
Abstention				-0.1111** (0.0461)	-0.2059*** (0.0423)
Δ_{14-10} abstention, %: 1 round					-0.7260*** (0.0646)
State-specific trends	No	Yes	Yes	Yes	Yes
N	558	558	558	558	558
R^2	0.134	0.539	0.557	0.568	0.673
adj. R^2	0.131	0.514	0.526	0.533	0.645

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of abstention between the 2018 and 2014 elections, 1st round. 'Male (female) shock' is \hat{L}_p^m (\hat{L}_p^f), as defined in equation (2). For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Change in abstention rate: shock by gender, 2nd round. Full table

	Δ_{18-14} abstention, %: 2 round				
	(1)	(2)	(3)	(4)	(5)
Male shock	-5.7651*** (2.1885)	0.3182 (2.4070)	4.0474 (3.2548)	3.9099 (3.3440)	4.9807* (2.8399)
Female shock	-10.0339** (5.1044)	-12.7190** (4.9762)	-15.3787*** (5.9162)	-15.2293** (6.0561)	-14.9946*** (5.0118)
Employment share			8.9528** (3.9133)	7.4625* (3.9001)	2.8784 (3.4896)
Male pop. share			-5.3409 (15.8964)	-14.9039 (16.0399)	-13.8387 (13.4780)
Nonwhite pop. share			1.3303 (1.6536)	1.6006 (1.8916)	1.5586 (1.6744)
<i>Education attainment (Ref. = < primary)</i>					
Primary			-7.4739 (9.2684)	-8.0077 (10.2240)	9.6592 (10.2288)
Secondary			-0.4039 (6.5200)	-1.4305 (6.9453)	-0.9224 (5.5753)
Tertiary			-6.4205 (10.7690)	1.0078 (10.7245)	-2.5217 (8.2747)
Bolsa Familia recipients			-17.4237* (9.1208)	-18.4250* (10.0742)	-13.2725 (8.3929)
Construction share			-15.2752 (13.8631)	-8.6143 (14.2410)	-13.7387 (13.5818)
<i>Votes 2010 (Ref. = Dilma (PT))</i>					
Serra (PSDB)				-0.0144 (0.0217)	-0.0030 (0.0177)
Marina (PV)				-0.0742 (0.0505)	-0.1004** (0.0418)
Fidelix (PRTB)				-1.4119 (5.2188)	0.2515 (4.3416)
Other				-1.0862 (0.9165)	-1.5155* (0.7725)
Null/blank				-0.1705 (0.1338)	-0.0283 (0.1161)
Abstention				-0.0891* (0.0512)	-0.2035*** (0.0458)
Δ_{14-10} abstention, %: 2 round					-0.7367*** (0.0599)
State-specific trends	No	Yes	Yes	Yes	Yes
N	558	558	558	558	558
R^2	0.095	0.527	0.542	0.554	0.675
adj. R^2	0.092	0.502	0.511	0.517	0.648

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of abstention between the 2018 and 2014 elections, 2nd round. 'Male (female) shock' is \hat{L}_r^m (\hat{L}_r^f), as defined in equation (2). For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Change in invalid votes (null/blank): shock by gender, 1st round. Full table

	Δ_{18-14} null/blank, %: 1 round				
	(1)	(2)	(3)	(4)	(5)
Male shock	-1.6508 (1.0657)	1.9242** (0.7500)	1.1937 (0.8012)	1.3389 (0.8240)	0.4130 (0.8053)
Female shock	0.5674 (2.2063)	-1.0481 (1.4225)	-2.8375* (1.5126)	-2.1172 (1.4668)	-0.7616 (1.4212)
Employment share			1.0115 (1.2447)	0.2016 (1.1559)	-0.1866 (1.1270)
Male pop. share			-4.3031 (4.7079)	-9.8787** (4.5216)	-7.6383* (4.5003)
Nonwhite pop. share			-0.7371 (0.5783)	-0.1005 (0.5992)	0.4176 (0.6156)
<i>Education attainment (Ref. = < primary)</i>					
Primary			-11.9649*** (3.4052)	-12.3045*** (2.9497)	-11.4120*** (2.8160)
Secondary			4.9396*** (1.7128)	2.1707 (2.0925)	2.8449 (1.9959)
Tertiary			-22.1306*** (3.1562)	-16.9837*** (2.8968)	-18.3753*** (2.8541)
Bolsa Familia recipients			-8.4160*** (2.8121)	-3.4730 (2.8311)	-9.2316*** (2.7083)
Construction share			-10.6124** (4.2431)	-6.9680* (3.9446)	-8.8564** (3.6687)
<i>Votes 2010 (Ref. = Dilma (PT))</i>					
Serra (PSDB)				0.0248*** (0.0061)	0.0279*** (0.0059)
Marina (PV)				0.0120 (0.0164)	0.0275* (0.0159)
Fidelix (PRTB)				5.3156*** (1.7049)	3.6174** (1.5322)
Other				-0.7599** (0.3074)	-0.2769 (0.3131)
Null/blank				-0.2156*** (0.0399)	-0.2795*** (0.0435)
Abstention				-0.0446** (0.0200)	-0.0552*** (0.0155)
Δ_{14-10} null/blank, %: 1 round					-0.3666*** (0.0873)
State-specific trends	No	Yes	Yes	Yes	Yes
N	558	558	558	558	558
R^2	0.010	0.718	0.756	0.791	0.815
adj. R^2	0.006	0.703	0.739	0.774	0.799

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of invalid votes (null/blank) between the 2018 and 2014 elections, 1st round. 'Male (female) shock' is \hat{L}_r^m (\hat{L}_r^f), as defined in equation (2). For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: Change in invalid votes (null/blank): shock by gender, 2nd round. Full table

	Δ_{18-14} null/blank, %: 2 round				
	(1)	(2)	(3)	(4)	(5)
Male shock	-3.8883*** (1.4885)	0.7679 (0.7933)	1.1855 (0.9293)	1.3932 (0.9808)	1.2185 (0.9826)
Female shock	-9.3367*** (2.9024)	-0.4368 (1.4400)	-3.9603** (1.7079)	-3.5746** (1.6505)	-3.5765** (1.6383)
Employment share			2.6140** (1.2285)	2.3118* (1.2317)	2.2566* (1.2265)
Male pop. share			-17.6204*** (5.2056)	-17.3556*** (5.1326)	-16.5315*** (5.1217)
Nonwhite pop. share			-0.0168 (0.6340)	1.2540* (0.7159)	1.5747** (0.6842)
<i>Education attainment (Ref. = < primary)</i>					
Primary			-14.0449*** (3.1676)	-12.4329*** (3.5169)	-12.2166*** (3.5557)
Secondary			2.1216 (1.7302)	1.0908 (1.9327)	1.3650 (1.9453)
Tertiary			-22.6855*** (3.2521)	-20.0393*** (3.3479)	-21.0880*** (3.4557)
Bolsa Familia recipients			-8.3864*** (2.7305)	-2.5773 (2.8678)	-3.6866 (2.7952)
Construction share			0.5632 (5.1230)	2.5713 (4.9238)	3.5646 (4.8236)
<i>Votes 2010 (Ref. = Dilma (PT))</i>					
Serra (PSDB)				0.0398*** (0.0068)	0.0433*** (0.0066)
Marina (PV)				0.0131 (0.0168)	0.0085 (0.0172)
Fidelix (PRTB)				4.3805** (1.9161)	4.1340** (1.8917)
Other				0.1692 (0.2992)	0.1574 (0.3016)
Null/blank				-0.0555 (0.0392)	-0.0685* (0.0404)
Abstention				-0.0246 (0.0181)	-0.0245 (0.0175)
Δ_{14-10} null/blank, %: 2 round					-0.1963* (0.1036)
State-specific trends					
<i>N</i>	No	Yes	Yes	Yes	Yes
<i>R</i> ²	558	558	558	558	558
adj. <i>R</i> ²	0.101	0.905	0.919	0.926	0.927
	0.098	0.900	0.914	0.920	0.921

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variable is the change in the % of invalid votes (null/blank) between the 2018 and 2014 elections, 2nd round. 'Male (female) shock' is L_r^m (L_r^f), as defined in equation (2). For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A9: Percentiles shocks

<i>I. Shock (overall)</i>							
min	p10	p25	p50	p75	p90	p99	max
-0.121	-0.004	0.094	0.215	0.348	0.462	0.628	0.808
<i>II. Female shock</i>							
min	p10	p25	p50	p75	p90	p99	max
-0.066	-0.027	-0.003	0.031	0.080	0.123	0.205	0.260
<i>III. Male shock</i>							
min	p10	p25	p50	p75	p90	p99	max
-0.055	0.021	0.089	0.175	0.268	0.348	0.477	0.548
<i>IV. Nonwhite shock</i>							
min	p10	p25	p50	p75	p90	p99	max
-0.074	0.001	0.033	0.109	0.250	0.344	0.504	0.657
<i>V. White shock</i>							
min	p10	p25	p50	p75	p90	p99	max
-0.074	-0.011	0.030	0.068	0.108	0.164	0.355	0.443

Notes: $N = 558$.

Table A10: Change in abstention and invalid votes: shock by gender. Robustness checks.

	Δ_{18-14} abstention, %				
<i>Panel A: 1st round</i>	(1)	(2)	(3)	(4)	(5)
Male shock	4.1058 (2.7256)	4.6357* (2.7760)	4.5104 (2.7729)	4.6535* (2.7432)	5.0381* (2.7998)
Female shock	-14.5382*** (4.8255)	-15.5163*** (4.9669)	-15.4665*** (4.9850)	-16.0628*** (4.8936)	-16.9043*** (5.0874)
Δ_{14-10} abstention, %: 1 round	-0.7260*** (0.0646)	-0.7223*** (0.0652)	-0.7248*** (0.0648)	-0.7299*** (0.0650)	-0.7269*** (0.0652)
Crime rate: men, 2012		0.0017 (0.0091)	0.0047 (0.0095)		0.0039 (0.0096)
Δ_{17-13} log(Crime rate): men			0.2978 (0.2616)		0.2866 (0.2600)
Δ_{14-10} null/blank, %: 1 round				0.1052 (0.1317)	0.1012 (0.1306)
Δ_{14-10} Dilma, % of votes: 1 round				0.0520* (0.0285)	0.0485* (0.0291)
<i>Panel B: 2nd round</i>	(1)	(2)	(3)	(4)	(5)
Male shock	4.9807* (2.8399)	4.9580* (2.8670)	4.7850* (2.8559)	5.4531* (2.8770)	5.1881* (2.9050)
Female shock	-14.9946*** (5.0118)	-15.4846*** (5.0838)	-15.4001*** (5.0907)	-15.9319*** (5.1142)	-16.2595*** (5.2046)
Δ_{14-10} abstention, %: 2 round	-0.7367*** (0.0599)	-0.7466*** (0.0663)	-0.7492*** (0.0657)	-0.7363*** (0.0601)	-0.7490*** (0.0657)
Crime rate: men, 2012		-0.0000 (0.0099)	0.0039 (0.0103)		0.0026 (0.0107)
Δ_{17-13} log(Crime rate): men			0.3972 (0.2723)		0.3853 (0.2709)
Δ_{14-10} null/blank, %: 2 round				0.0573 (0.2539)	0.0297 (0.2589)
Δ_{14-10} Dilma, % of votes: 2 round				0.0573** (0.0284)	0.0518* (0.0283)
	Δ_{18-14} null/blank, %				
<i>Panel C: 1st round</i>	(1)	(2)	(3)	(4)	(5)
Male shock	0.4130 (0.8053)	0.4417 (0.8231)	0.4024 (0.8162)	0.3678 (0.8089)	0.3581 (0.8206)
Female shock	-0.7616 (1.4212)	-0.8940 (1.4662)	-0.8718 (1.4529)	-0.6191 (1.4298)	-0.7254 (1.4595)
Δ_{14-10} null/blank, %: 1 round	-0.3666*** (0.0873)	-0.3671*** (0.0877)	-0.3687*** (0.0882)	-0.3703*** (0.0887)	-0.3722*** (0.0896)
Crime rate: men, 2012		-0.0027 (0.0035)	-0.0019 (0.0035)		-0.0018 (0.0035)
Δ_{17-13} log(Crime rate): men			0.0809 (0.1040)		0.0813 (0.1043)
Δ_{14-10} abstention, %: 1 round				0.0048 (0.0204)	0.0024 (0.0209)
Δ_{14-10} Dilma, % of votes: 1 round				-0.0051 (0.0118)	-0.0058 (0.0120)
<i>Panel D: 2nd round</i>	(1)	(2)	(3)	(4)	(5)
Male shock	1.2185 (0.9826)	1.2945 (0.9969)	1.2026 (0.9850)	1.2180 (0.9772)	1.1575 (0.9823)
Female shock	-3.5765** (1.6383)	-3.8679** (1.6828)	-3.8261** (1.6560)	-3.4852** (1.6394)	-3.6764** (1.6574)
Δ_{14-10} null/blank, %: 2 round	-0.1963* (0.1036)	-0.1953* (0.1029)	-0.1995* (0.1046)	-0.1896* (0.1038)	-0.1920* (0.1052)
Crime rate: men, 2012		-0.0002 (0.0040)	0.0019 (0.0041)		0.0017 (0.0041)
Δ_{17-13} log(Crime rate): men			0.2014* (0.1037)		0.2052** (0.1044)
Δ_{14-10} abstention, %: 2 round				-0.0216 (0.0199)	-0.0184 (0.0224)
Δ_{14-10} Dilma, % of votes: 2 round				-0.0052 (0.0121)	-0.0071 (0.0121)
	<i>Control variables in all panels:</i>				
State-specific trends	Yes	Yes	Yes	Yes	Yes
Socio-demographics	Yes	Yes	Yes	Yes	Yes
Election 2010	Yes	Yes	Yes	Yes	Yes
N	558	554	554	558	554

Notes: OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome variables are: the change in the % of abstention between the 2018 and 2014 elections, either in the 1st (Panel A) or 2nd (Panel B) round; and the % of invalid votes (null/blank) between the 2018 and 2014 elections, either in the 1st (Panel C) or 2nd (Panel D) round. ‘Male (female) shock’ is L_r^m (L_r^f) and ‘white (nonwhite) shock’ is L_r^w (L_r^{nw}), as defined in equation (2). ‘Overall shock’ is $L_r = L_r^m + L_r^f$. ‘Crime rate: men, 2012’ is homicides per 100,000 inhabitants (male victims only), in 2012. ‘ Δ_{17-13} log(Crime rate): men’ is the log difference in male crime rates between 2017 and 2013. ‘ Δ_{14-10} abstention, %’, ‘ Δ_{14-10} null/blanks, %’, and ‘ Δ_{14-10} Dilma, % of votes’ are, respectively, the change in % of abstention, % of invalid votes (null/blank), and % of votes for Dilma (PT) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels B-D) round. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETS recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A11: Further robustness

Δ_{18-14} PT, % of votes: 1st round				
	Base	Pop. weighted	Mesoreg. FEs	
	(1)	(2)	(3)	
<i>Panel A: Overall shock</i>				
Shock (overall)	0.4787 (1.9524)	-1.7219 (2.2813)	-0.5262 (2.0967)	
<i>Panel B: Shock by gender</i>				
Male shock	-10.2338*** (3.1059)	-17.1141*** (4.1986)	-7.1930** (3.6037)	
Female shock	24.9837*** (5.7282)	30.9709*** (6.9177)	14.7785** (6.7497)	
<i>Panel C: Shock by race</i>				
White shock	2.9475 (3.8975)	-1.1963 (4.2397)	0.1432 (3.7981)	
Nonwhite shock	-1.1618 (3.0340)	-2.1083 (3.2100)	-0.9786 (3.1476)	
<hr/>				
Bolsonaro, % of votes: 1st round				
	Base	Pop. weighted	Mesoreg. FEs	Δ Fidelix ₁₄
	(1)	(2)	(3)	(4)
<i>Panel D: Overall shock</i>				
Shock (overall)	1.3155 (2.3345)	5.7773* (3.0551)	-1.3972 (2.0967)	1.3429 (2.3323)
<i>Panel E: Shock by gender</i>				
Male shock	8.7450** (3.8550)	13.2806** (5.3168)	2.2571 (3.9507)	8.7725** (3.8463)
Female shock	-15.6799** (7.5242)	-10.1596 (10.3540)	-9.7863 (7.7972)	-15.6527** (7.5105)
<i>Panel F: Shock by race</i>				
White shock	-5.0425 (5.3624)	-2.6925 (6.2415)	-6.1435 (4.1952)	-4.9986 (5.3510)
Nonwhite shock	5.5402 (3.8792)	12.0029*** (3.8997)	1.8100 (3.4424)	5.5567 (3.8661)
<hr/>				
<i>Control variables in all panels:</i>				
State-specific trends/dummies	Yes	Yes	No	Yes
Mesoregion-specific trends	No	No	Yes	No
Socio-demographics	Yes	Yes	Yes	Yes
Election 2010	Yes	Yes	Yes	Yes
Δ_{14-10} Dilma, % of votes	Yes	Yes	Yes	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. ‘Male (female) shock’ is \dot{L}_r^m (\dot{L}_r^f) and ‘white (nonwhite) shock’ is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETI recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} Dilma, % of votes’ is the change in the % of votes for Dilma (PT) between the 2014 and 2010 elections, in the 1st round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A12: Change in PT votes, 2018–2014: changing standard errors

Δ_{18-14} PT, % of votes: 1st round			
<i>Panel A: Overall shock</i>	microregion	mesoregion	state
Shock (overall)	0.4787 (1.9524)	0.4787 (2.0145)	0.4787 (2.4587)
<i>Panel B: Shock by gender</i>	microregion	mesoregion	state
Male shock	-10.2338*** (3.1059)	-10.2338*** (3.3102)	-10.2338** (4.6959)
Female shock	24.9837*** (5.7282)	24.9837*** (5.2732)	24.9837*** (6.4904)
<i>Panel C: Shock by race</i>	microregion	mesoregion	state
White shock	2.9475 (3.8975)	2.9475 (4.6822)	2.9475 (8.0336)
Nonwhite shock	-1.1618 (3.0340)	-1.1618 (2.6876)	-1.1618 (3.6296)
Δ_{18-14} PT, % of votes: 2nd round			
<i>Panel D: Overall shock</i>	microregion	mesoregion	state
Shock (overall)	2.4649 (2.2021)	2.4649 (2.2566)	2.4649 (2.8018)
<i>Panel E: Shock by gender</i>	microregion	mesoregion	state
Male shock	-5.6310 (3.6198)	-5.6310 (4.0875)	-5.6310 (6.3096)
Female shock	20.8310*** (6.9552)	20.8310*** (7.4870)	20.8310* (10.8421)
<i>Panel F: Shock by race</i>	microregion	mesoregion	state
White shock	4.2888 (4.7619)	4.2888 (5.3464)	4.2888 (6.9903)
Nonwhite shock	1.2549 (3.7965)	1.2549 (3.4670)	1.2549 (4.2459)
<i>Control variables in all panels:</i>			
State-specific trends	Yes	Yes	Yes
Socio-demographics	Yes	Yes	Yes
Election 2010	Yes	Yes	Yes
Δ_{14-10} Dilma, % of votes	Yes	Yes	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level in column 1, robust standard errors clustered at mesoregion level in column 2, robust standard errors clustered at state level in column 3. The outcome variable is the change in the % of votes for PT (Workers' Party) between the 2018 and 2014 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. 'Male (female) shock' is \dot{L}_r^m (\dot{L}_r^f) and 'white (nonwhite) shock' is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). 'Overall shock' is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. 'Socio-demographics' refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Familia or PETI recipients, and share employed in construction sector (1-digit). 'Election 2010' are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ' Δ_{14-10} Dilma, % of votes' is the change in the % of votes for Dilma (PT) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A13: Bolsonaro vote share, 2018: changing standard errors

Bolsonaro, % of votes: 1st round			
<i>Panel A: Overall shock</i>	microregion	mesoregion	state
Shock (overall)	1.3155 (2.3345)	1.3155 (2.3468)	1.3155 (2.6269)
<i>Panel B: Shock by gender</i>	microregion	mesoregion	state
Male shock	8.7450** (3.8550)	8.7450* (4.4235)	8.7450 (6.3949)
Female shock	-15.6799** (7.5242)	-15.6799* (8.8945)	-15.6799 (12.8602)
<i>Panel C: Shock by race</i>	microregion	mesoregion	state
White shock	-5.0425 (5.3624)	-5.0425 (5.8147)	-5.0425 (6.8749)
Nonwhite shock	5.5402 (3.8792)	5.5402 (3.9711)	5.5402 (4.6081)
Bolsonaro, % of votes: 2nd round			
<i>Panel D: Overall shock</i>	microregion	mesoregion	state
Shock (overall)	-0.4761 (2.1424)	-0.4761 (2.1623)	-0.4761 (2.5499)
<i>Panel E: Shock by gender</i>	microregion	mesoregion	state
Male shock	6.7982* (3.5342)	6.7982* (3.8334)	6.7982 (5.5661)
Female shock	-16.9783** (7.1497)	-16.9783** (7.6143)	-16.9783 (10.6055)
<i>Panel F: Shock by race</i>	microregion	mesoregion	state
White shock	-5.8946 (4.9817)	-5.8946 (5.4356)	-5.8946 (7.2632)
Nonwhite shock	3.1184 (3.8062)	3.1184 (3.6901)	3.1184 (4.3767)
<i>Control variables in all panels:</i>			
State dummies	Yes	Yes	Yes
Socio-demographics	Yes	Yes	Yes
Election 2010	Yes	Yes	Yes
Δ_{14-10} Dilma, % of votes	Yes	Yes	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level in column 1, robust standard errors clustered at mesoregion level in column 2, robust standard errors clustered at state level in column 3. The outcome variable is the % of votes for Jair Bolsonaro (PSL) in the 2018 election, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. ‘Male (female) shock’ is \dot{L}_r^m (\dot{L}_r^f) and ‘white (nonwhite) shock’ is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETI recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} Dilma, % of votes’ is the change in the % of votes for Dilma (PT) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A14: Change in abstention rate, 2018–2014: changing standard errors

	Δ_{18-14} abstention, %: 1st round		
	microregion	mesoregion	state
<i>Panel A: Overall shock</i>			
Shock (overall)	-1.5981 (1.5783)	-1.5981 (1.6167)	-1.5981 (2.1813)
<i>Panel B: Shock by gender</i>			
Male shock	4.1058 (2.7256)	4.1058 (2.6874)	4.1058 (3.1424)
Female shock	-14.5382*** (4.8255)	-14.5382*** (5.2589)	-14.5382** (5.9404)
<i>Panel C: Shock by race</i>			
White shock	-3.5175 (2.4881)	-3.5175 (2.7530)	-3.5175 (3.4677)
Nonwhite shock	-0.3249 (2.2772)	-0.3249 (2.5652)	-0.3249 (3.3002)
	Δ_{18-14} abstention, %: 2nd round		
<i>Panel D: Overall shock</i>			
Shock (overall)	-1.1314 (1.6941)	-1.1314 (1.7149)	-1.1314 (2.3202)
<i>Panel E: Shock by gender</i>			
Male shock	4.9807* (2.8399)	4.9807* (2.6422)	4.9807 (3.3496)
Female shock	-14.9946*** (5.0118)	-14.9946*** (5.2027)	-14.9946** (6.1483)
<i>Panel F: Shock by race</i>			
White shock	-2.5786 (2.7164)	-2.5786 (3.0177)	-2.5786 (3.4121)
Nonwhite shock	-0.1732 (2.5275)	-0.1732 (2.7840)	-0.1732 (3.4517)
	<i>Control variables in all panels:</i>		
State-specific trends	Yes	Yes	Yes
Socio-demographics	Yes	Yes	Yes
Election 2010	Yes	Yes	Yes
Δ_{14-10} Dilma, % of votes	Yes	Yes	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level in column 1, robust standard errors clustered at mesoregion level in column 2, robust standard errors clustered at state level in column 3. The outcome variable is the change in the % of abstention between the 2018 and 2014 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. ‘Male (female) shock’ is \dot{L}_r^m (\dot{L}_r^f) and ‘white (nonwhite) shock’ is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETI recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} abstention’ is the change in the % of abstention between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A15: Change in invalid votes (null/blank), 2018–2014: changing standard errors

	Δ_{18-14} null/blank, %: 1st round		
<i>Panel A: Overall shock</i>	microregion	mesoregion	state
Shock (overall)	0.0518 (0.4592)	0.0518 (0.4482)	0.0518 (0.5705)
<i>Panel B: Shock by gender</i>	microregion	mesoregion	state
Male shock	0.4130 (0.8053)	0.4130 (0.7473)	0.4130 (0.9450)
Female shock	-0.7616 (1.4212)	-0.7616 (1.4827)	-0.7616 (1.4422)
<i>Panel C: Shock by race</i>	microregion	mesoregion	state
White shock	4.4796*** (0.9306)	4.4796*** (0.9136)	4.4796*** (0.9689)
Nonwhite shock	-2.8668*** (0.6294)	-2.8668*** (0.6390)	-2.8668*** (0.7749)
	Δ_{18-14} null/blank, %: 2nd round		
<i>Panel D: Overall shock</i>	microregion	mesoregion	state
Shock (overall)	-0.2512 (0.5558)	-0.2512 (0.5007)	-0.2512 (0.5013)
<i>Panel E: Shock by gender</i>	microregion	mesoregion	state
Male shock	1.2185 (0.9826)	1.2185 (0.9846)	1.2185 (1.0258)
Female shock	-3.5765** (1.6383)	-3.5765** (1.7728)	-3.5765* (1.8633)
<i>Panel F: Shock by race</i>	microregion	mesoregion	state
White shock	3.2331*** (1.0736)	3.2331*** (1.0594)	3.2331*** (1.0843)
Nonwhite shock	-2.5492*** (0.7906)	-2.5492*** (0.7400)	-2.5492*** (0.7369)
<i>Control variables in all panels:</i>			
State-specific trends	Yes	Yes	Yes
Socio-demographics	Yes	Yes	Yes
Election 2010	Yes	Yes	Yes
Δ_{14-10} Dilma, % of votes	Yes	Yes	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level in column 1, robust standard errors clustered at mesoregion level in column 2, robust standard errors clustered at state level in column 3. The outcome variable is the change in the % of invalid votes (null/blank) between the 2018 and 2014 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. ‘Male (female) shock’ is \dot{L}_r^m (\dot{L}_r^f) and ‘white (nonwhite) shock’ is \dot{L}_r^w (\dot{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\dot{L}_r = \dot{L}_r^m + \dot{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Familia or PETI recipients, and share employed in construction sector (1-digit). ‘Election 2010’ are voting outcomes of the 1st round of the 2010 presidential election: % of valid votes for Serra (PSDB), Marina (PV), Fidelix (PRTB), and Other (with Dilma (PT) being the omitted category); % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} null/blank’ is the change in the % of invalid votes (null/blank) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A16: Falsification test: change in Dilma’s vote share, 2014–2010

	Δ_{14-10} vote share, %: 1st round		
<i>Panel A: Overall shock</i>	(1)	(2)	(3)
Shock (overall)	1.3703 (2.5617)	1.3703 (2.8786)	1.3703 (3.3839)
<i>Panel B: Shock by gender</i>	(1)	(2)	(3)
Male shock	-3.6274 (4.0579)	-3.6274 (4.4878)	-3.6274 (4.2581)
Female shock	12.9334 (8.2672)	12.9334 (10.2860)	12.9334 (10.4682)
<i>Panel C: Shock by race</i>	(1)	(2)	(3)
White shock	-5.6243 (4.5644)	-5.6243 (4.7779)	-5.6243 (5.7005)
Nonwhite shock	6.2195* (3.5572)	6.2195 (3.8516)	6.2195 (4.7483)
	Δ_{14-10} vote share, %: 2nd round		
<i>Panel D: Overall shock</i>	(1)	(2)	(3)
Shock (overall)	-1.3691 (2.6038)	-1.3691 (3.1272)	-1.3691 (3.1637)
<i>Panel E: Shock by gender</i>	(1)	(2)	(3)
Male shock	-5.2421 (4.1676)	-5.2421 (4.9653)	-5.2421 (4.2401)
Female shock	7.5921 (8.6621)	7.5921 (11.0627)	7.5921 (11.5477)
<i>Panel F: Shock by race</i>	(1)	(2)	(3)
White shock	-7.6297 (4.7827)	-7.6297 (5.1357)	-7.6297 (6.3750)
Nonwhite shock	2.9713 (3.7424)	2.9713 (4.1491)	2.9713 (4.2643)
	<i>Control variables in all panels:</i>		
State-specific trends	Yes	Yes	Yes
Socio-demographics	Yes	Yes	Yes
Election 2010	Yes	Yes	Yes

Notes: $N = 558$. OLS estimates reported with robust standard errors clustered at microregion level in parentheses. The outcome variable is the change in the % of votes for Dilma Rousseff between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. ‘Male (female) shock’ is \hat{L}_r^m (\hat{L}_r^f) and ‘white (nonwhite) shock’ is \hat{L}_r^w (\hat{L}_r^{nw}), as defined in equation (2). ‘Overall shock’ is $\hat{L}_r = \hat{L}_r^m + \hat{L}_r^f$. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 Census. They include: employment share, male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETI recipients, and share employed in construction sector (1-digit). % of invalid votes (null or blank), and the abstention rate. ‘ Δ_{14-10} null/blank’ is the change in the % of invalid votes (null/blank) between the 2014 and 2010 elections, either in the 1st (Panels A-C) or 2nd (Panels D-F) round. For regressions without state dummies, an intercept term is also included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.