



## Regular Article

Economic shocks, gender, and populism: Evidence from Brazil<sup>☆</sup>Laura Barros<sup>a</sup>, Manuel Santos Silva<sup>b,\*</sup><sup>a</sup> University of Goettingen, Germany<sup>b</sup> Freie Universität Berlin, Germany

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## ABSTRACT

This paper investigates whether differential exposure to a labor market shock by gender contributed to the rise of far-right populism in Brazil. Using a shift-share approach, we find that gender heterogeneity in shock exposure predicts electoral outcomes. Male-specific labor demand shocks increase support for Jair Bolsonaro in the 2018 presidential election, but female-specific shocks have the reverse effect. These opposing effects are accompanied by an unprecedented gender gap in political preferences, with men becoming relatively more conservative. Our preferred interpretation is that Bolsonaro's conservative rhetoric – shared by several other right-wing populists – generates appeal among men who experience a relative loss in economic status.

## 1. Introduction

How are gender norms and economic conditions related to the recent rise of right-wing populism? Anecdotal evidence suggests that right-wing populist leaders often promote conservative gender views and traditional norms of masculinity.<sup>1</sup> At the same time, a large body of research documents that voting patterns are responsive to economic conditions.<sup>2</sup> While the economics literature has examined how identity and cultural traits interact with economic shocks to drive radical political movements, systematic evidence on the relationship between gender, economic conditions, and populism remains limited.

This paper fills this research gap by investigating whether the differential exposure of men and women to a large economic recession explains regional variation in support for a far-right populist politician. Our setting is Brazil, which joined the right-wing populist tide

with the election of Jair Bolsonaro as president in October 2018. Brazil provides a relevant context to investigate our research question for two main reasons. First, the 2018 election immediately followed a severe economic crisis that, between 2014 and 2017, interrupted more than one decade of sustained economic growth, accompanied by falling poverty and inequality. By being concentrated in relatively male-intensive industries, the crisis led to heterogeneous labor demand shocks by gender.

Second, beyond the economic context, the 2018 election was notable for the emergence of a large political gender gap in Brazil. As we document later on, before 2018, there are no (conditional) gender differences in political preferences with respect to ideology, party or president's approval. After 2018, a large gender gap emerges, with men

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<sup>1</sup> Prime examples of conservative gender rhetoric in ultimately successful presidential campaigns are Jair Bolsonaro in 2018 in Brazil, and Donald Trump and Rodrigo Duterte in 2016 in the United States and the Philippines. More generally, the platforms of far-right European parties, such as the Alternative für Deutschland (AfD), in Germany, and the Fratelli d'Italia (FdI), in Italy, have often incorporated conservative gender values.

<sup>2</sup> For an excellent overview of the recent literature on the rise of populism, see [Guriev and Papaioannou \(2022\)](#).

becoming relatively more conservative. At the same time, Bolsonaro's long history of misogynistic comments brought gender issues to the forefront of the electoral campaign and sparked massive women-led protests prior to the first round of voting.<sup>3</sup>

To causally identify how local labor demand shocks affect voting outcomes, we apply the shift-share framework of [Borusyak et al. \(2022\)](#).<sup>4</sup> To measure gender-specific local labor demand shocks, we weigh changes in national employment across 5-digit industries during the 2014–17 recession by the pre-crisis (2010) local industrial structure of employment and its sexual segregation by industry.<sup>5</sup> Our preferred measure of relative shock exposure by gender is the (standardized) difference between the male and female shocks. We find that in regions where men experience larger economic shocks relative to women, Bolsonaro receives a higher share of the votes.<sup>6</sup> In the first round of the election, a one standard deviation increase in the difference between the male and female shock raises Bolsonaro's vote share by 0.9–1.1 percentage points.

How should we interpret the results? We hypothesize that men gravitate towards Bolsonaro, a politician who exacerbates masculine stereotypes, as a way of compensating for losses in social and economic status. Employment and relative earnings are central for male identity ([Bertrand et al., 2015](#); [Autor et al., 2019](#)). And when men perceive their identity under attack, they often respond by exaggerating their masculinity and aggressiveness ([Cheryan et al., 2015](#)).<sup>7</sup> Some authors argue that anxiety surrounding masculinity is an important, even if understudied, determinant of men's political behavior (see [DiMuccio and Knowles, 2020](#), for a review).<sup>8</sup>

More broadly, 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](#); [Rodrik, 2018](#)). In particular, traditionally dominant groups become more authoritarian when hit by economic shocks ([Ballard-Rosa et al., 2022](#)). Many studies in psychology document that when facing a (real or imagined) threat to their social status, people become more hostile to outside groups, especially those identified as the source of the threat (e.g., [Tajfel, 1978](#); [Riek et al., 2006](#); [Leach and Spears, 2008](#)). In the United States, [Mutz \(2018b\)](#) argues that perceived status threat by dominant groups was a key factor explaining Trump's victory in 2016.<sup>9</sup>

<sup>3</sup> Shortly before the first round of voting, women organized massive protests against Bolsonaro under the #EleNÃO (Not Him) movement.

<sup>4</sup> The key identifying assumption is that *national* employment changes by industry during the recession are conditionally exogenous ([Borusyak et al., 2022](#)).

<sup>5</sup> In practice, these measures are gender-specific Bartik-type labor demand shocks ([Bartik, 1991](#)). For similar approaches measuring gender-specific local exposure to aggregate labor market shocks, see e.g. [Aizer \(2010\)](#), [Anderberg et al. \(2016\)](#), [Lindo et al. \(2018\)](#), [Autor et al. \(2019\)](#), [Page et al. \(2019\)](#).

<sup>6</sup> We find opposite effects for the percentage-point change in votes for the left-wing Workers' Party (*Partido dos Trabalhadores*, PT) between the 2014 and 2018 elections.

<sup>7</sup> A related literature on intimate partner violence (IPV) suggests that, in some contexts, men become more violent after an increase in their partners' income ([Koenig et al., 2003](#); [Weitzman, 2014](#); [Bulte and Lensink, 2019](#)). In household bargaining models, this response is often explained by male backlash theories ([Bloch and Rao, 2002](#); [Eswaran and Malhotra, 2011](#); [Luke and Munshi, 2011](#)). Results 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. \(2019\)](#) find null effects in Bangladesh.

<sup>8</sup> For example, regional vote shares for Donald Trump in 2016 positively correlate with internet searches on topics that reflect men's insecurities about their manhood ([DiMuccio and Knowles, 2021](#)).

<sup>9</sup> [Morgan \(2018\)](#), however, challenges [Mutz's](#) conclusions, arguing instead that economic voting motives were decisive in the 2016 US presidential election. See also [Mutz \(2018a\)](#).

In sum, based on this literature, we interpret our main findings as follows: In areas where male employment declines more than female employment, Bolsonaro's authoritarian and masculine stereotypes become more popular among men, as they seek to compensate losses in social and economic status. Conversely, in areas where female employment is relatively more affected, men's *relative* status improves, shutting off the compensation mechanism.

To support this interpretation, we analyze individual views on abortion, a highly controversial issue at the core of the gender equality debate in Brazil. Leveraging five rounds of the World Values Survey, covering, for Brazil, the period 1991–2018, we find a large conditional gender gap in support for abortion starting in 2018 (before the October election) among economically unsatisfied respondents, with men becoming relatively more conservative. There is no gender gap among economically satisfied respondents, nor before 2018. In placebo analyses for Mexico, we estimate null gender gaps for all years and sub-groups. These descriptive patterns suggest that (1) men's economic insecurities are reflected in their gender attitudes, and (2) this dynamic uniquely coincided with Bolsonaro's presidential run (but not before, and not elsewhere).

To be sure, Bolsonaro's far-right platform was multi-dimensional, and we cannot decisively disentangle which elements (or combination thereof) drive the differential responses to the gender-specific shocks. But we can reject a few prominent alternative hypotheses. First, in a context of rising violent crime, whose victims and perpetrators are overwhelmingly male, Bolsonaro's tough-on-crime agenda may be particularly appealing for men. Although the level and growth of violent crime predict support for Bolsonaro, these effects are largely independent from the gender-specific shock effects. Second, irrespective of the actual crime rate, men's perception of crime or preference for liberalized gun laws in times of crisis could explain their support for Bolsonaro, who defends laxer gun-ownership laws. We proxy preference for this policy position with the regional percentage of 'No' votes in the 2005 referendum on the ban of firearms and ammunition sales.<sup>10</sup> Interestingly, a 1 percentage-point increase in local 'No' votes in 2005 raises Bolsonaro's vote share in the first round by 0.6 percentage points. But, once again, this effect is independent from the gender-shock effects, which remain qualitatively stable. Third, due to Bolsonaro's strong ties to (Neo)-Pentecostal churches and the documented relationship between economic downturns and the rise of (Neo)-Pentecostalism in Brazil ([Costa et al., 2023](#)), we investigate if our effects are explained by religion. Despite predicting positively support for Bolsonaro in the 2018 election, (changes in) religious demand prior to the crisis do not explain away our gender-specific effects. Fourth, because Bolsonaro is strongly attached to the Brazilian military, not only as former army Captain, but also as a vocal supporter of the military regime (1964–85), we test whether differences in local military presence (which is overwhelmingly male) could explain our main results. We control for the pre-crisis share of local employment in the military and the number of young men and women drafted for military service between 2013 and 2017. None of these variables predicts Bolsonaro's vote share, nor affects the estimates of the gender-specific shocks. Lastly, because exposure to the economic shock could lead to heterogeneous migration responses by gender – potentially also correlated with individuals' political preferences – we report robust estimates when controlling for changes in the number of female and male registered voters or the share of internal migrants prior to 2010.

To the best of our knowledge, this is the first paper focusing on the differential responses to economic shocks by gender and their consequences for the election of a far-right president. Moreover, while most of the literature on the recent rise of populism and extremism

<sup>10</sup> The referendum took place on October 23, 2005, and asked 'Should the sale of firearms and ammunition be banned in Brazil?'. 'No' won with 64% of valid votes.

focuses on advanced economies, evidence from developing countries remains scarce (Guriev and Papaioannou, 2022). In contrast to the ongoing right-wing populist surge in advanced economies, Latin American populism has been mostly associated with the left (Dornbusch and Edwards, 1991; Edwards, 2019). Bolsonaro's election represented a turning point in the region. Lastly, whereas most of the existing findings are best understood as medium to long-run effects of secular processes – such as trade integration, immigration, secular stagnation – we, on the other hand, focus on a severe, well-defined economic crisis (2014–17) that happens immediately before the 2018 presidential election.

The paper relates to several strands of research. First, we speak directly to the literature on the role of economic shocks for the rise of populism and extremism. Local economic shocks from rising import competition increase political polarization and extremism in the United States (Autor et al., 2020), and support for nationalist and isolationist parties in Western Europe (Colantone and Stanig, 2018; Dippel et al., 2022). Similarly, rising unemployment and economic insecurity following the Great Recession increased voting for anti-establishment parties, depressed voter turnout, and eroded trust in European institutions (Algan et al., 2017; Dal Bó et al., 2023; Dehdari, 2022; Guiso et al., 2024). In the United Kingdom, austerity reforms starting in 2010 decisively tilted the 2016 Brexit referendum in favor of Leave (Fetzer, 2019). What distinguishes our paper from the existing literature is the focus on the differential effects of economic shocks by gender.

Second, we contribute to the literature on the effects of populist rhetoric on real-world outcomes. While our main outcome is electoral success, recent studies reveal that populist rhetoric matters more broadly. Ajzenman et al. (2023) show the detrimental impacts of Bolsonaro's speeches during the COVID-19 pandemic on individuals' compliance with protective measures. Similarly, Müller and Schwarz (2023) find that Donald Trump's political rise was associated with an increase in anti-Muslim hate crimes in the United States.

Third, we contribute to the growing body of evidence on the consequences of differential local economic shocks by gender. Whereas previous studies have estimated impacts on child well-being (Lindo et al., 2018; Page et al., 2019; Autor et al., 2019), fertility (Anukriti and Kumler, 2019; Autor et al., 2019), marriage (Autor et al., 2019), and employment (Kis-Katos et al., 2018), we are one of the first to estimate effects on politics.

Fourth, we draw upon and contribute new evidence to the literature on the economics of social identity (Akerlof and Kranton, 2000; Bertrand et al., 2015; Bursztyjn et al., 2017). And, finally, we contribute to the empirical literature estimating socio-economic consequences of labor market shocks in Brazil. Most studies exploit the process of trade liberalization (1988–1995) as a natural experiment to estimate local labor market effects on wages and employment (Kovak, 2013; Dix-Carneiro and Kovak, 2017; Gaddis and Pieters, 2017), crime (Dix-Carneiro et al., 2018), religion (Costa et al., 2023), fertility (Braga, 2018), and race inequality (Hirata and Soares, 2020; Barros and Santos Silva, 0000). In contrast to that literature, we provide evidence on a more recent and unexplored economic shock – the 2014–17 recession – and link it to the rise of far-right populism in Brazil.

The next section presents the political and economic context preceding the presidential election of 2018. Section 3 discusses the empirical strategy. In Section 4, we present the main local labor market results and assess their robustness. Section 5 discusses mechanisms, and Section 6 concludes.

## 2. Background

*Political context.* The 2018 Brazilian presidential election featured a contest between far-right candidate Jair Bolsonaro, running for the Social Liberal Party (*Partido Social Liberal*, henceforth PSL) and left-wing Fernando Haddad from the Workers' Party (*Partido dos Trabalhadores*, henceforth PT). Bolsonaro won the first round of the election on

October 7 with 46.03% of the votes, and the runoff against Haddad on October 28 with 55.13%.<sup>11</sup> Fig. 4(c) shows the percentage of votes for Bolsonaro in the first round, by Brazilian microregion.<sup>12</sup> Support for Bolsonaro varied widely across regions during the runoff, ranging from 10.3% to 85.5% of valid votes.

Throughout his political career, Bolsonaro became known for views widely considered sexist, homophobic, racist, and, overall, illiberal. For example, in 2003, he told a congresswoman that he would not rape her because she was not “worth it”. Bolsonaro has also openly defended the military regime and its regular practice of torturing political opponents.<sup>13</sup> Regarding his homophobic views, he declared in an interview that he “would not be able to love a homosexual son”.<sup>14</sup>

Bolsonaro's rhetorical attacks targeted not only minority groups, but also had a misogynistic component. It seems puzzling, from a strategic perspective, that a candidate would openly insult women in a majoritarian electoral system. While the political and social context leading to Bolsonaro's victory emerged from various factors, including rising crime and a large corruption scandal (*Lava Jato*, or Car Wash), we argue that the economic crisis, particularly through its differential gender dimension, partially explains the electoral outcome.

*Economic crisis.* The decade 2003–2013 was prosperous in Brazil. Through sustained economic growth and rising social spending (e.g., Hall, 2006), the country experienced a rapid decline in poverty and inequality (e.g., Alvarez et al., 2018; Ferreira et al., 2022). However, the economy was hit by a severe recession starting in late 2014 (Fig. 1(a)). The crisis arose from a combination of factors, including a decline in commodity prices, macroeconomic mismanagement, and widespread political and economic uncertainty following a large corruption scandal (*Lava Jato*, or Car Wash) (Mello and Spektor, 2018; Spilimbergo and Srinivasan, 2018; Hunter and Power, 2019).

The main consequence of the recession for the average Brazilian was a steep rise in unemployment, which increased from less than 7% in the first quarter of 2014 to 13% in the first quarter of 2017 (Fig. 1(b)). However, due to the variation in job losses across industries and the high level of gender segregation in Brazil's labor market, the economic shock ended up affecting men and women differently. To illustrate this point, Online Appendix Figure A1 shows the evolution of employment for a nearly all-male industry (construction) and a nearly all-female industry (domestic work). During the crisis, these two industries experienced different employment trajectories, with large job losses in construction, but mild job gains in domestic work. Thus, depending on the initial composition of employment by industry, the economic crisis affected male and female workers differently across regions.

*Political gender gap.* Gender-related issues featured prominently in the 2018 presidential campaign, largely due to Bolsonaro's controversial views. Two pieces of evidence reveal the emergence of a large political gender gap specific to the 2018 election.

First, individual-level survey data from the *AmericasBarometer* for the period 2007–2019 show that this large political gender gap occurs only in the 2018 election and its aftermath (Fig. 2). Conditional on standard socio-demographic characteristics, there was no discernible

<sup>11</sup> A detailed description of the political context and the events leading up to Bolsonaro's 2018 victory is available in Online Appendix A.

<sup>12</sup> A microregion is a statistical unit between a municipality and a federal state. We define microregions more precisely in Section 3.

<sup>13</sup> For example, in 2016, during the lower chamber's vote to impeach then-president Dilma Rousseff (PT), he dedicated his vote to Colonel Brilhante Ustra, one of the most infamous torturers of Brazil's military dictatorship.

<sup>14</sup> The 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).

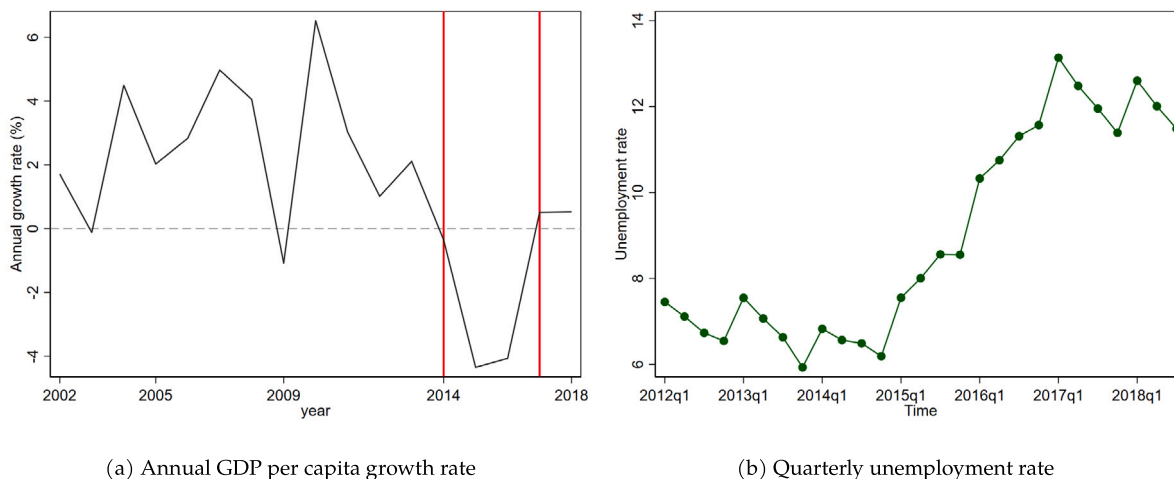


Fig. 1. The 2014–17 economic crisis in Brazil

Notes: GDP per capita growth: Period is 2002–2018. Constant prices. Own calculations from World Bank’s World Development Indicators. Unemployment rates: Period is 2012Q1–2018Q3 and age group is 18–64. Own calculations from PNAD Contínua.

gender gap in left–right ideology or voting intentions for the incumbent party before 2018. In 2019, however, there was a notable shift among men to the right of the political spectrum, as seen by a higher likelihood of supporting Bolsonaro’s party (at the time: PSL).<sup>15</sup> Moreover, this relative shift in political preferences is entirely driven by men moving towards the right (Fig. 2(d)), rather than women becoming more left-wing (Fig. 2(c)).

Second, administrative data on party affiliations disaggregated by gender reveal an unprecedented surge in male affiliations for PSL, once Bolsonaro joins the party in January 2018, but not before (Fig. 3(a)).<sup>16</sup> While female affiliations evolved similarly to earlier election cycles, male affiliations more than doubled. Fig. 3(b) shows the yearly gender ratio of new members joining PSL and PT since the founding of each party. The disproportionate increase in male membership that can be attributed to Bolsonaro is unprecedented in both parties’ historical record.

### 3. Empirical strategy

Our empirical strategy relies on a Bartik-type labor demand shock (Bartik, 1991) measured using a shift-share variable at the local labor market level: a Brazilian microregion.<sup>17</sup> 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 national employment for industry  $i$  between the pre-crisis period and the pre-election period. We compute  $\bar{L}_i$  from PNAD<sup>18</sup> Contínua, a quarterly household survey that covers the formal

and informal sectors and is the source of official unemployment statistics. 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 at the national level between the two periods for 223 industries.<sup>19</sup> 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 ( $m =$  males,  $f =$  females), we construct:

$$\dot{L}_r^m = \sum_i \frac{M_{ri}^0}{M_r^0} \dot{L}_i^m \quad \text{and} \quad \dot{L}_r^f = \sum_i \frac{F_{ri}^0}{F_r^0} \dot{L}_i^f \quad (2)$$

where  $M_{ri}^0$  ( $F_{ri}^0$ ) is the number of males (females) employed in industry  $i$ , in microregion  $r$ , from the 2010 census.  $\dot{L}_i^m$  ( $\dot{L}_i^f$ ) is the log difference in average employment for males (females) for industry  $i$  between the pre-crisis period and the pre-election period. Finally, we compute similar shocks by race—with superscript  $w$  for whites, and  $nw$  for nonwhites.<sup>20</sup>

Altogether, there is substantial variation in the intensity of the gender-specific shocks across the 558 microregions of Brazil (Figs. 4(a) and 4(b)). Table 1 displays summary statistics for the shock variables. On average, men are hit harder by the crisis than women. Within microregions, the shocks are highly correlated:  $\rho = 0.83$  for gender shocks (Online Appendix Figure A2a) and  $\rho = 0.93$  for race shocks (Online Appendix Figure A2b).<sup>21</sup> Due to the high correlation between

<sup>15</sup> Details on the data and estimation method are available in Online Appendix E.

<sup>16</sup> Before the 2018 election, PSL was one of the many ‘parties for rent’ in the Brazilian system (Desposato, 2006), characterized by loose ideology, no previous electoral success in presidential elections, and high turnover of politicians. Because Bolsonaro only joined the party ten months before the presidential election, we can confidently interpret large changes in PSL membership as a consequence of Bolsonaro’s candidacy.

<sup>17</sup> A 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.

<sup>18</sup> Pesquisa Nacional por Amostra de Domicílios (National Household Sample Survey).

<sup>19</sup> This corresponds to the 5-digit level of CNAE Domiciliar 2.0—Brazil’s classification of economic activities since 2006. Because the PNAD Contínua, in its publicly available format, does not include regional identifiers below the federal state level and is not representative at the microregion level, we cannot compute the *actual* local change in employment during the crisis.

<sup>20</sup> The 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*.

<sup>21</sup> The correlation between the gender shocks compares to that ( $\rho = 0.8$ ) reported by Autor et al. (2019, p. 167), whose shock is the decline of manufacturing jobs across US commuting zones induced by import competition

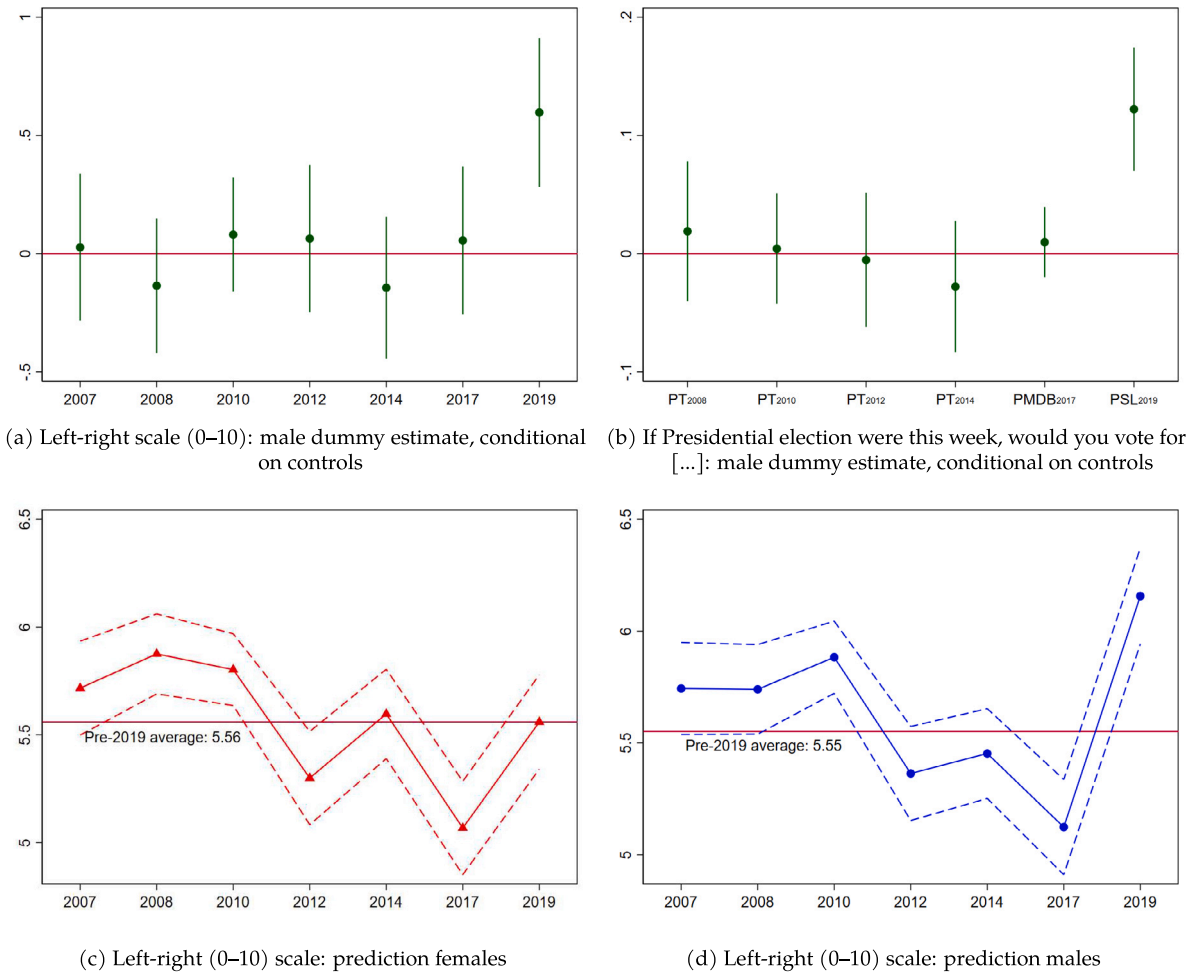


Fig. 2. Political preferences by gender.

Notes: Figs. 2(a) and 2(b) show male dummy coefficients with 95% confidence intervals. Own calculations from AmericasBarometer. Control variables are: age, age squared, race, presence of Bolsa Familia recipient in the household, labor force participation and employment status, educational attainment, marital status, religion, perceived improvement/deterioration of own economic situation in the last 12 months, being a crime victim in the last 12 months, urban/rural, and state dummies. Regressions are estimated separately for each survey year. Figs. 2(c) and 2(d) show predicted mean values by gender with 95% confidence bands. Predicted means obtained from OLS regressions that control for the same variables listed above. Regressions are estimated separately for each survey year. Horizontal red lines plot the average predicted ideology for each gender before 2019.

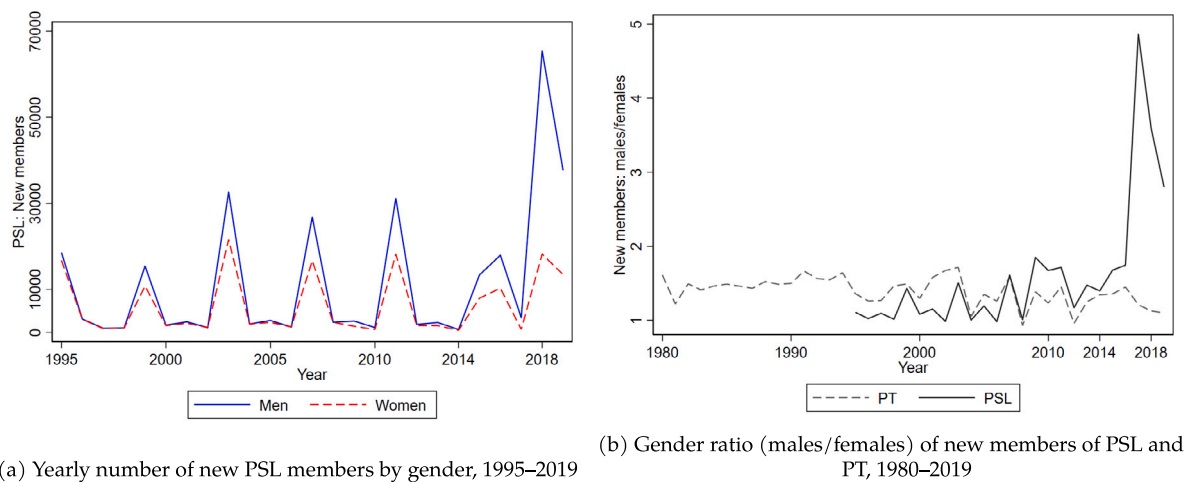
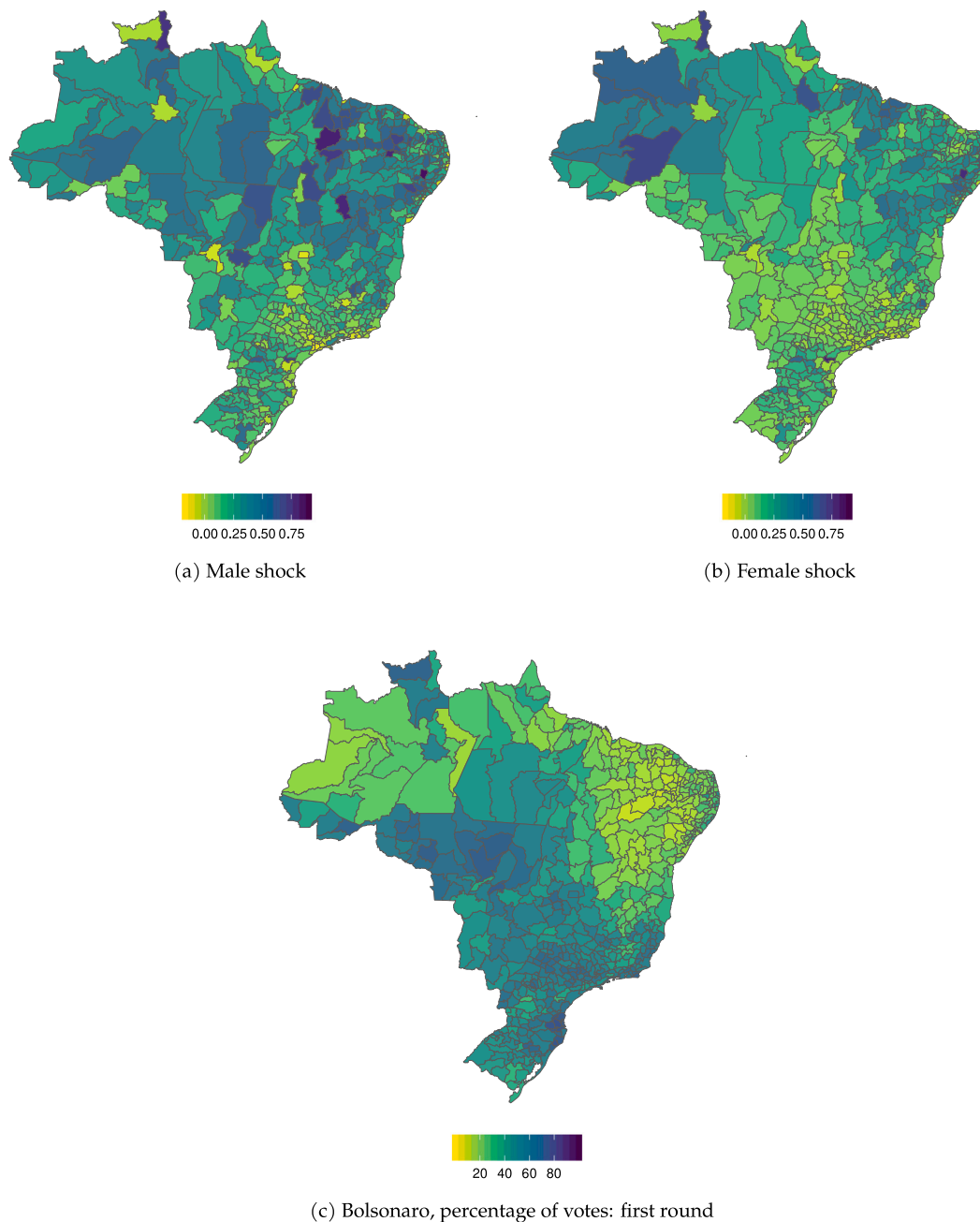


Fig. 3. Party affiliations by gender.

Notes: The largest spike in PSL membership occurs during the month of the presidential election, October 2018. PT was founded in February 1980; PSL was founded in October 1994. Own calculations from TSE data. For details, see Online Appendix D.



**Fig. 4.** Labor demand shock and votes for Bolsonaro.

Notes: Figs. 4(a) and 4(b) show the male shock ( $\dot{L}_r^m$ ) and the female shock ( $\dot{L}_r^f$ ), as defined in Eq. (2). Fig. 4(c) shows the percentage of votes for Jair Bolsonaro in the first round of the 2018 Brazilian presidential election. Unit of analysis is the microregion.  $N = 558$ . (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

the shocks, we construct relative exposure measures as the difference between the male and female shocks ( $\dot{L}_r^m - \dot{L}_r^f$ ) and between the white and nonwhite shocks ( $\dot{L}_r^w - \dot{L}_r^{nw}$ ).

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

$$Bolsonaro_r = \beta_g(\dot{L}_r^m - \dot{L}_r^f) + \delta\Delta_{14-10}PT\ votes_r + \mathbf{X}_{10,r}\gamma + \eta_s + \epsilon_r, \quad (3)$$

from China. To alleviate concerns of multicollinearity, we use the difference between the male and female shocks ( $\dot{L}_r^m - \dot{L}_r^f$ ) as our primary measure of interest.

The dependent variable,  $Bolsonaro_r$ , is the percentage of votes for Bolsonaro in the 2018 election in microregion  $r$ .<sup>22</sup> In the relative gender

<sup>22</sup> Because Bolsonaro's first run for president was in 2018, we use the percentage-point change in votes for PT between 2014 and 2018 as an alternative outcome variable. Because the election was mostly a two-horse race, the results are nearly symmetric. For the change in votes for PT between 2014 and 2018, we estimate the following model:

$$\Delta_{18-14}PT\ votes_r = \beta_g(\dot{L}_r^m - \dot{L}_r^f) + \delta\Delta_{14-10}PT\ votes_r + \mathbf{X}_{10,r}\gamma + \eta_s + \epsilon_r$$

Because this model is estimated in differences, microregion-specific time-invariant characteristics are removed. Later on, in robustness checks, we also allow 'far-right' baseline values in 2014 that differ from zero. All results remain

**Table 1**  
Descriptive statistics.

	mean	sd	min	max
<i>Election outcomes: 1st round</i>				
Bolsonaro, % of votes	40.78	18.36	7.24	74.50
$\Delta_{18-14}$ PT, % votes	-12.55	9.21	-50.21	16.88
$\Delta_{18-14}$ abstention, %	0.19	3.73	-12.66	10.52
$\Delta_{18-14}$ null/blank, %	-0.35	1.79	-8.66	4.52
<i>Election outcomes: 2nd round</i>				
Bolsonaro, % of votes	48.61	21.43	10.30	85.35
$\Delta_{18-14}$ PT, % votes	-5.37	7.17	-33.64	10.27
$\Delta_{18-14}$ abstention, %	-0.17	4.02	-12.49	12.30
$\Delta_{18-14}$ 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	0.26	0.20	-0.15	0.87
Female shock	0.18	0.16	-0.06	0.81
White shock	0.23	0.14	-0.06	0.74
Nonwhite shock	0.20	0.19	-0.17	0.87
Male shock-Female shock	0.08	0.11	-0.24	0.40
White shock-Nonwhite shock	0.02	0.08	-0.35	0.23
<i>Controls 2010 census:</i>				
Male employment share	0.73	0.06	0.53	0.92
Female employment share	0.47	0.08	0.26	0.78
Population, log	11.63	0.96	7.43	15.98
Male pop. share	0.50	0.02	0.45	0.56
Nonwhite pop. share	0.54	0.22	0.06	0.91
Bolsa Família recipients	0.10	0.07	0.00	0.24
Construction share	0.07	0.02	0.00	0.17
Primary education share	0.14	0.03	0.06	0.35
Secondary education share	0.21	0.06	0.07	0.45
Tertiary education share	0.06	0.03	0.02	0.22
<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>Election outcomes: <math>\Delta_{14-10}</math>: 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>Election outcomes: <math>\Delta_{14-10}</math>: 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			

regression, shown in Eq. (3), our coefficient of interest is  $\beta_g$  which represents the conditional effect of the relative gender shock. For ease of interpretation, all shock variables are standardized.

We include three sets of control variables. First, we control for the lagged change in support for PT,  $\Delta_{14-10} PT\ votes_{r,t}$ , which is the percentage-point change in votes for PT between the 2014 and 2010 presidential elections. Next, vector  $\mathbf{X}_{10,r}$  includes pre-crisis socio-demographics and election results for each microregion, both measured in 2010. Socio-demographics come from the 2010 census and refer to the out-of-school adult population (18+). We include male and female employment shares, the log of population, the share of males, the share of nonwhites, the shares with completed primary, secondary, or tertiary education, the share of recipients of Bolsa Família,<sup>23</sup> and the share employed in the construction sector (1-digit level). The 2010

qualitatively unchanged. In the Online Appendix, we also present results for the percentage-point change in the abstention rate, and the percentage-point change in invalid votes (nulls or blanks).

<sup>23</sup> Bolsa Família is the flagship federal conditional cash transfer that became highly popular and is an important predictor of political support for PT. The

election controls include the first round percentage of votes for the main candidates: José Serra (PSDB) and Marina da Silva (PV), the second and third most voted candidates, Levy Fidelix (PRTB), who ran a far-right political platform,<sup>24</sup> and the percentage of votes for the other remaining candidates, with the most voted candidate – Dilma Rousseff (PT) – being the omitted candidate. The percentage of invalid votes and the abstention rate in 2010 are also controlled for. As a third set of controls, the model includes state dummies ( $\eta_s$ ). Altogether, our preferred specification accounts for differences in pre-crisis socio-demographic and political characteristics, at the microregion level, and, at a higher level, state-specific fixed effects.<sup>25</sup> 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 levels of clustering. Table 1 reports descriptive statistics for all outcomes, labor demand shocks, and control variables.

*Causal identification.* To obtain causal estimates for the shift-share coefficients, we follow the quasi-experimental framework of Borusyak et al. (2022), in which the sufficient identifying assumption is conditional shift (i.e., shock) orthogonality.<sup>26</sup> Borusyak et al. (2022) show that this assumption holds if shocks are quasi-randomly assigned, occur in large number, and their average exposure shares are sufficiently dispersed. We argue that, in our setting, the shift – i.e., aggregate change in a 5-digit industry's employment by gender and race – satisfies these three conditions.

We start by justifying the assumption that the industry-level shocks are as-good-as-randomly assigned, conditional on controls. By including a set of electoral and socio-demographic controls, we account for pre-existing political outcomes and socio-demographic characteristics at the microregion level that could correlate with local election outcomes. In particular, we control for the share of employment in the construction sector, because the expansion and contraction cycles of this (predominantly male) 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 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 fixed effects are a particularly powerful control: state-specific fixed effects *alone* absorb 79% of the microregional variation in the percentage of votes for Bolsonaro (first round).<sup>27</sup>

Later on, we augment the baseline specification with several economic and political variables covering the period between 2002, when PT wins its first presidential election, and 2014. These additional controls purge pre-existing economic and political changes at the local level that may correlate with the 2014–18 crisis. In another exercise, we further relax the identification assumption by using as shift the

census variable also includes recipients of the federal program against child labor (Programa de Erradicação do Trabalho Infantil, PETI).

<sup>24</sup> The candidate with the most far-right platform in the 2010 and 2014 elections, Levy Fidelix (PRTB), performed very poorly. He received 57,960 votes (0.06%) in 2010 and 446,878 votes (0.43%) in 2014.

<sup>25</sup> When estimating the model with the change in votes for PT between 2018 and 2014, we account for differential trends based on pre-crisis socio-demographic and political characteristics, at the microregion level, alongside state-specific trends.

<sup>26</sup> See Goldsmith-Pinkham et al. (2020) for an alternative causal inference framework for shift-share designs that depends on *share* exogeneity.

<sup>27</sup> For the second round, the  $R^2$  is slightly higher, 0.82. To be precise, state dummies include the 26 federal states and the federal district (Brasília).

change in employment by industry for the *total* population (i.e.,  $\dot{L}_i$  as in Eq. (1)), instead of using gender- and race-specific shifts. In those alternative shift-share measures, gender- and race-specific variation comes only from the *pre-crisis* (2010) labor market composition across microregions.

In addition to satisfying conditional shock orthogonality, the validity of our shift-share approach requires additional assumptions on the shift and share variables (Borusyak et al., 2022). The shift variable needs to be relatively large in number, and the distribution of the average shares needs to be sufficiently dispersed. Although there is no clear threshold for satisfying these criteria, we follow Borusyak et al. (2022) and provide descriptive evidence in favor of the validity of our identification strategy. First, we calculate the Herfindahl index (HHI) using the average exposure share by industry and find low concentration (HHI = 0.026). Second, we take a closer look at the distribution of the overall shock variable by industry as well as its associated average exposure shares. As shown in Online Appendix Table A1, for the 10 most exposed and 10 least exposed industries, the shares range from 1% to 10%. These relatively low exposure shares also indicate that the shock variable is not driven by a few particular industries, but is rather dispersed depending on a microregion’s initial industrial composition. Third, with respect to the number of shocks, we exploit variation in employment across 5-digit industries, which corresponds to a total of 223 shocks.

Despite being causally identified, the regression models of Eq. (3) suffer from two shortcomings. First, we cannot infer individual behavior from microregion level aggregates. Second, our empirical strategy relies on variation across microregions and, as a result, cannot pin-down the factors contributing to the common-trend component of Bolsonaro’s electoral success.

#### 4. Local labor market results

Table 2 presents results for the share of votes for Bolsonaro in the first (Panels A–B) and runoff (Panels C–D) rounds of the 2018 election.<sup>28</sup> In all specifications, each shock variable is standardized, so the estimated coefficient is readily interpreted as the effect of a one standard deviation (SD) increase in the shock. Panel A of Table 2 estimates the effect of the overall shock,  $\dot{L}_r$ . For all Panels, Columns 1–5 sequentially introduce sets of controls, with the fully-specified model of Eq. (3) shown in Column 5. In the first two Columns, there is a negative and significant correlation between the overall shock and the share of votes for Bolsonaro. However, this correlation vanishes once socio-demographics are controlled for (Column 3). This result suggests that the overall shock disproportionately hit microregions whose pre-crisis socio-demographics were already predictive of lower support for Bolsonaro. For the full model, in Column 5, the effect is small and statistically insignificant. In sum, average exposure to the 2014–17 labor demand shock does not affect voting for Bolsonaro.

However, the null overall effect masks a striking gender-specific effect. Column 5 of Panel B shows that the larger the difference between the male and the female shocks, the larger the support for Bolsonaro in the 2018 election. A one SD increase in the difference between the male and female shock increases Bolsonaro’s vote share by 0.6–0.9 percentage points.<sup>29</sup> The results presented in Online Appendix Table A2, on the percentage-point change in PT votes between the 2014

<sup>28</sup> Results for further outcomes, measured as changes between 2014 and 2018, are shown in the Online Appendix: PT vote share (Table A2), abstention rates (Table A5), and invalid vote share (Table A6). Results with race shocks are shown in Online Appendix Table A4.

<sup>29</sup> We expect the explanatory power of our model to be larger in the first round of the election, as voters are unconstrained with respect to the number of candidates and are free to decide their most preferred choice. In the runoff, however, there is less variation, and it is difficult to disentangle whether voters align with a candidate or simply reject the alternative choice.

**Table 2**  
Bolsonaro vote share, 2018.

Bolsonaro, % of votes: 1st round					
Panel A: Overall shock	(1)	(2)	(3)	(4)	(5)
Shock (overall)	-11.3283*** (0.5849)	-5.5970*** (0.4261)	-0.1919 (0.5608)	0.2211 (0.4635)	0.4231 (0.4078)
Panel B: Relative shock	(1)	(2)	(3)	(4)	(5)
Male shock–Female shock	-2.4054*** (0.8170)	-1.1648** (0.5695)	1.1199*** (0.3294)	1.1133*** (0.2658)	0.9191*** (0.2471)
Bolsonaro, % of votes: 2nd round					
Panel C: Overall shock	(1)	(2)	(3)	(4)	(5)
Shock (overall)	-13.5781*** (0.6729)	-6.1719*** (0.4750)	-0.3745 (0.5817)	0.1754 (0.4470)	0.1028 (0.3684)
Panel D: Relative shock	(1)	(2)	(3)	(4)	(5)
Male shock–Female shock	-3.1607*** (0.9241)	-1.5722*** (0.5695)	0.9374*** (0.3532)	1.0506*** (0.2638)	0.6211** (0.2432)
Control variables in all panels:					
State dummies	No	Yes	Yes	Yes	Yes
Socio-demographics	No	No	Yes	Yes	Yes
Election 2010	No	No	No	Yes	Yes
$\Delta_{14-10}$ PT, % 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 percentage of votes for Jair Bolsonaro (PSL) in the 2018 election, either in the first (Panels A–B) or second (Panels C–D) round. ‘Overall shock’ is  $\dot{L}_r$ , as defined in Eq. (1). ‘Male shock–Female shock’ is defined as  $L_r^m - L_r^f$ . All shocks are measured in standard deviations. ‘Socio-demographics’ refer to the out-of-school adult population (18+) and are measured from the 2010 census. They include: male employment share, female employment share, population (log), 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 first round of the 2010 presidential election: percentage of valid votes for José Serra (PSDB), Marina da Silva (PV), Levy Fidelix (PRTB), and Other (with Dilma Rousseff (PT) being the omitted category); percentage of invalid votes (null or blank), and the abstention rate. ‘ $\Delta_{14-10}$  PT, % of votes’ is the change in the percentage of votes for Dilma Rousseff (PT) between the 2014 and 2010 elections, either in the first (Panels A–C) or second (Panels D–F) round. For regressions without state dummies, an intercept term is also included.

and 2018 elections, show symmetric effects. In Online Appendix Table A3, we report estimates for the male and female shocks regressed as separate variables. We find that both shocks are significant predictors of Bolsonaro’s vote shares, but with opposing effects. Regions where men are hit stronger by the economic shock exhibit higher vote shares for Bolsonaro, whereas regions where women are hit stronger by the shock exhibit lower electoral support for Bolsonaro.

The race-specific coefficients are shown in Online Appendix Table A4. Although the estimates are imprecise, the point estimates for the relative shock by race (Column 5, Panels B and D) are positive. This fits a pattern where stronger relative shocks for white individuals increase voting for a candidate that supports the racial status quo, whereas relative increases in nonwhite shocks have opposite effects. However, the lack of precision of the estimates does not allow us to draw robust conclusions.

In sum, we find that average exposure to the 2014–17 labor demand shock does not significantly affect support for Bolsonaro. In sharp contrast, however, exposure to the shock by gender matters, with the relative male shock having a strong positive effect for Bolsonaro.<sup>30</sup>

<sup>30</sup> We also benchmark the magnitude of our relative shock coefficient with respect to Bolsonaro’s victory margin. The predictions and underlying regression models are weighted by the microregion’s share of total national valid votes in the first round of the election. Online Appendix Table A7 reports the counterfactual predictions. Our results predict that if the relative gender shock were set at its maximum value, Bolsonaro would have gained an outright majority and become president already in the first round.



*Change in abstention and invalid votes.* In Online Appendix B, we report additional results on abstention and invalid ballots (null or blank). In short, we find no robust effects for invalid ballots, but find that a relatively larger male shock increases abstention rates in the runoff.

*Accounting for economic and political pre-trends.* At this point, a pertinent concern is whether local exposure to the 2014–17 crisis correlates with pre-existing structural changes in economic and political conditions. To systematically test this possibility, we augment the baseline model with economic and political pre-trends.

We start by considering local economic pre-trends in three dimensions: employment, GDP per capita, and industry composition (Table 3: Panel A). First, in Columns 1 to 3 of Panel A, we control for the microregion's change in employment share between the 2000 and 2010 censuses for the overall population (Columns 1), separately for men and women (Column 2), and both by gender and separately for white and nonwhite (Column 3). In Columns 4 to 6, we control in several ways for the microregion's GDP per capita: as the pre-crisis (2013) level (Column 4); as the pre-crisis growth between 2002 and 2013 (Column 5); and as the growth in each pre-crisis presidential election cycle separately—2002–06, 2006–10, 2010–14 (Column 6). Third, in Columns 7 to 9, we control for the microregion's industry composition of employment at the 2-digit level. We start by including industry shares in 2010 (22 industries, Column 7) and in 2000 (17 industries, Column 8). Then, we control for the change in the employment share by industry between 2000 and 2010 (17 industries, Column 9). Overall, the relative gender effects of the 2014–17 economic shock remain robust throughout.

Next, we consider political pre-trends (Table 3: Panel B). In Column 1, we add the percentage-point change in votes for PT between 2010 and 2006 and between 2006 and 2002. Together with the baseline control variable  $-\Delta_{14-10}$  PT, % of votes – these models flexibly allow for differential trends based on lagged changes in PT votes since Lula's first victory in 2002. In the remaining Columns, we control for the percentage of votes of the top 3–4 candidates, as well as the percentage of invalid votes and the abstention rate, for the presidential elections of 2014 (Column 2), 2006 (Column 3), and 2002 (Column 4). The presidential elections of 2010 are always included as part of the baseline model. As before, the relative shock coefficients by gender are qualitatively robust to the inclusion of these political pre-trends.

In sum, the large and significant gender effects in response to the economic crisis are not explained by changes in employment, output, industry composition, and electoral results in the preceding one and a half decades. These results support the identifying assumption of conditional shock exogeneity.

*Dynamics and falsification.* We now investigate the dynamics of the period leading up to the 2014–17 crisis and perform falsification exercises by purposefully mismatching the timing of shift-share measures to different electoral cycles. The outcome variable is the percentage-point change in votes for PT, which is well defined for all presidential election cycles. As a result, the models are estimated in differences and implicitly absorb microregion fixed effects. To this end, we create shift-share measures between 2002 and 2018 for time windows of up to six years. Because throughout most of the period until 2014 aggregate employment was increasing in Brazil, we define the shift-share as the predicted *growth* in a microregion's employment, as opposed to the 'shock' shift-share measure defined in Eq. (1), where larger values implied larger employment losses. The only practical implication is that the signs of the gender coefficients flip relative to the results presented so far. Online Appendix C describes in detail the data sources and procedure to construct the shift-shares for the extended period. Before presenting the results, it is worth emphasizing that the assumption of conditional shock exogeneity only applies to the years of the large and unexpected crisis of 2014–17. Before 2014, when the economy was growing at a relatively robust pace, the shift-share coefficients should be interpreted with caution, because aggregate employment changes by industry are unlikely to represent exogenous shifts to labor demand.

We start by confirming that the heterogeneous effects of the gender shocks are specific to the 2018 election. Fig. 5 plots the coefficients of employment growth by gender for each 4-year election cycle between 2002 and 2018, conditional on baseline controls and a lagged dependent variable. Only in the crisis cycle, 2014–18, does the gendered pattern emerge: male employment growth increases support for PT and female employment growth decreases it. In previous election cycles, between 2002 and 2014, there is no relationship between the evolution of local employment by gender and votes for the incumbent PT. This finding reinforces our view that the supply of populist rhetoric by Bolsonaro interacted with the gendered-demand for such rhetoric created during the crisis. In previous elections, when these two ingredients are absent, the relationship disappears.

We then perform a variety of exercises by redefining the time window of the economic shock. First, we fix the end-year of the shift-shares at 2018 and vary the base-year between 2012 and 2017. The gender effects are highly significant for all base years up to 2016, but decrease rapidly in absolute magnitude for the periods 2016–18 and 2017–18, when they become indistinguishable from zero (Online Appendix Table A8, Panel A). This pattern fits well the evolution of the crisis; by 2017 the bulk of the employment losses had already occurred. Second, we fix the base-year of the shift-shares at 2012 and vary the end-year between 2013 and 2018. Once more, the estimates are fully consistent with the evolution of the crisis (Online Appendix Table A8, Panel B). Between 2012 and 2015, the gender effects are small and mostly insignificant. After 2016, which was the peak year of the crisis, the effects become significant and increase up to 2018.

As falsification, we show that shift-shares defined in the pre-crisis period of 2002–2014 have no effect on the change in PT's support between 2014 and 2018 (Online Appendix Table A9). This is the case irrespective of the base- and end-years used to define the shift-shares. Analogously, shift-shares defined in the crisis period of 2014–18 fail to systematically predict the change in PT's support in the three pre-crisis election cycles of 2014–10, 2010–06, and 2006–02 (Online Appendix Table A10).<sup>31</sup> These falsification exercises further support the validity of the identification strategy.

*Further robustness checks.* We perform a battery of additional robustness checks, presented in detail in Online Appendix F. We show that, overall, the results remain qualitatively robust after: relaxing the linear functional form; weighting each microregion by population; replacing the 27 state-specific trends with 137 mesoregion-specific trends; allowing for a non-zero, 'far-right' 2014 vote share for the Bolsonaro outcome variable; and using more conservative standard error estimates, clustered at the mesoregion-level (137 clusters) and state-level (27 clusters). We also test two alternative measures of the shock; one that calculates the relative loss in employment directly, rather than using the log-difference approximation, and another that removes the gender- and race-specific variation from the shift, only using the aggregate change in total employment for identification. The results remain robust throughout.

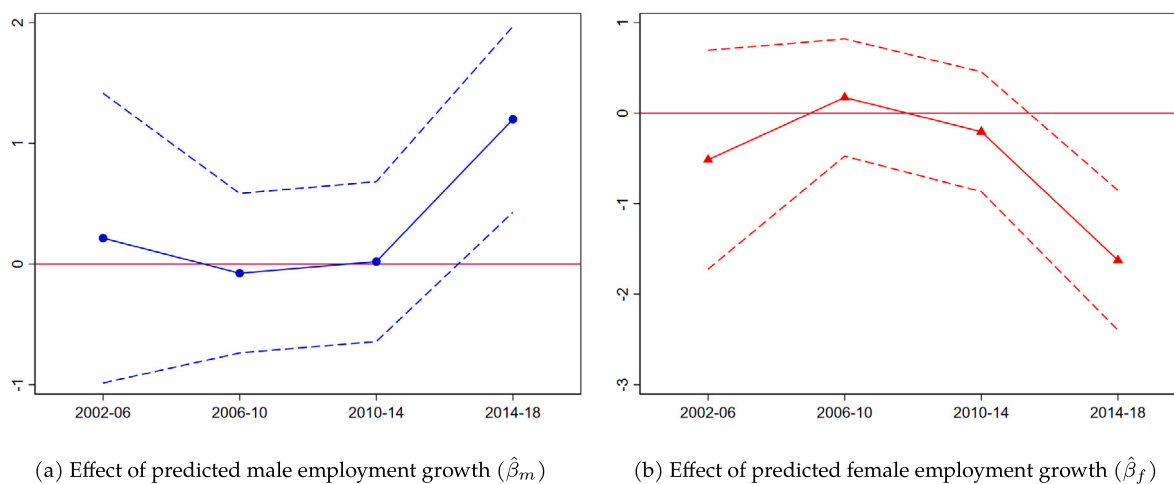
Finally, because we have a relative measure of exposure to the shock by gender and the two shocks are highly correlated, we additionally regress the female and male shocks separately and also include them individually in the regressions. The signs of the gender coefficients remain consistent with the baseline model, i.e., male shocks increase (decrease) support for Bolsonaro (PT) and female shocks have the opposite effect.

<sup>31</sup> The only exception is the significant coefficient of the female shift-share between 2012 and 2018 for the 2014–18 election cycle. However, the female coefficient is statistically insignificant for all other end-years (2013–2017).

**Table 3**  
Bolsonaro's vote share, first round, 2018: controlling for economic and political pre-trends.

Panel A: Economic pre-trends	Employment pre-trends:			GDP pre-trends:			Industry share pre-trends:		
	$\Delta_{10-00}$ employment share:			GDP per capita:			Industries (2-digit-level):		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Overall	By gender	By gender and race	Log (2013)	Growth (2013–2002)	Growth per election cycle	Share (2010)	Share (2000)	$\Delta_{10-00}$
Male shock–Female shock	0.9165*** (0.2474)	0.8858*** (0.2560)	0.8688*** (0.2618)	0.9282*** (0.2457)	0.9196*** (0.2477)	0.8995*** (0.2513)	0.9279*** (0.2592)	0.9809*** (0.2489)	0.6768*** (0.2568)
Panel B: Political pre-trends	Pre-crisis elections:								
	(1)	(2)	(3)	(4)					
	$\Delta_{10-06}$ PT and $\Delta_{06-02}$ PT	Election 2014	Election 2006	Election 2002					
Male shock–Female shock	0.8715*** (0.2496)	0.6741** (0.2646)	0.8445*** (0.2540)	0.9208*** (0.2286)					

Notes:  $N = 558$ . OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome is the percentage of votes for Bolsonaro (PSL) in the first round of the 2018 election. 'Male shock–Female shock' is defined as  $L_r^m - L_r^f$  and measured in standard deviations. Panel A—' $\Delta_{10-00}$  employment share' is the change in the employment share between 2000 and 2010 for total employment (Column 1: 'Overall'), male and female employment as separate variables (Column 2: 'By gender'), and white and nonwhite employment as separate variables (Column 3: 'By gender and race'). Real per capita GDP included as log in 2013 (Column 4), as log-difference between 2013 and 2002 (Column 5), and as three separate log-differences for each pre-crisis election cycle: 2014–10, 2010–06, and 2006–02 (Column 6). Column 7: for 2010, employment shares by industry, at the 2-digit-level, include 22 industries from the 2010 census (classification: CNAE Domiciliar 2.0). Column 8: for 2000, employment shares for 17 industries from the 2000 census (classification: CNAE Domiciliar 1.0). Column 9: change in employment shares by industry between 2000 and 2010 considers the 17 (2-digit) industries from CNAE Domiciliar 1.0. In Column 7, construction sector share is excluded from the 'Socio-demographics' controls due to perfect collinearity. Panel B—Column 1: ' $\Delta_{10-06}$  PT' is the change in the percentage of votes for PT's candidate between the 2010 (Dilma Rousseff) and 2006 (Lula da Silva) elections, in the first round. ' $\Delta_{06-02}$  PT' is the change in the percentage of votes for PT's candidate Lula da Silva between the 2006 and 2002 elections, in the first round. Column 2: 'Election 2014' are voting outcomes of the first round of the 2014 presidential election: percentage of valid votes for Aécio Neves (PSDB), Marina da Silva (PSB), Levy Fidelix (PRTB), and Other (with Dilma Rousseff (PT) being the omitted category); percentage of invalid votes (null or blank), and the abstention rate. Column 3: 'Election 2006' are voting outcomes of the first round of the 2006 presidential election: percentage of valid votes for Geraldo Alckmin (PSDB), Heloísa Helena (PSOL), and Other (with Lula da Silva (PT) being the omitted category); percentage of invalid votes (null or blank), and the abstention rate. Column 4: 'Election 2002' are voting outcomes of the first round of the 2002 presidential election: percentage of valid votes for José Serra (PSDB), Anthony Garotinho (PSB), Ciro Gomes (PPS), and Other (with Lula da Silva (PT) being the omitted category); percentage of invalid votes (null or blank), and the abstention rate. All regressions in Panels A and B control for federal state dummies, 'Socio-demographics', 'Election 2010' and ' $\Delta_{14-10}$  PT, % of votes'. 'Socio-demographics' refer to the out-of-school adult population (18+) and are measured from the 2010 census. They include: male employment share, female employment share, population (log), 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 first round of the 2010 presidential election: percentage of valid votes for José Serra (PSDB), Marina da Silva (PV), Levy Fidelix (PRTB), and Other (with Dilma Rousseff (PT) being the omitted category); percentage of invalid votes (null or blank), and the abstention rate. ' $\Delta_{14-10}$  PT, % of votes' is the change in the percentage of votes for Dilma Rousseff (PT) between the 2014 and 2010 elections, in the first round.



**Fig. 5.** Conditional effect of predicted employment growth by gender on the percentage-point change in PT votes by presidential election cycle, 2002–2018.  
Notes: Figure shows estimated OLS coefficients ( $\hat{\beta}_m$  in Panel (a) and  $\hat{\beta}_f$  in Panel (b)) and 95% confidence intervals from four regressions specified as  $\Delta_{t-4}^t PT \% vote_r = \beta_{m,t} \dot{E}_{r,t(t-4,t)}^m + \beta_{f,t} \dot{E}_{r,t(t-4,t)}^f + \delta_t \Delta_{t-8}^{t-4} PT_r + \mathbf{V}_{t-8,t} \mathbf{r} + \mathbf{X}_{10,t} \mathbf{r} + \eta_{st} + \epsilon_{rt}$ , with  $t = 2006, 2010, 2014, 2018$ .  $N = 558$  microregions in all regressions. Standard errors are clustered at microregion level,  $r$ . The employment growth variables,  $\dot{E}_{r,t(t-4,t)}^m$  and  $\dot{E}_{r,t(t-4,t)}^f$ , are shift-shares, measured in standard deviations; for details on their construction, see Online Appendix C.  $\eta_{st}$  are state dummies.  $\mathbf{V}_{t-8,t}$  are voting outcomes of the first round of the presidential election in  $t - 8$ . In 2010: percentage of valid votes for José Serra (PSDB), Marina da Silva (PV), Levy Fidelix (PRTB), and Other (with Dilma Rousseff (PT) being the omitted category). In 2006: percentage of valid votes for Geraldo Alckmin (PSDB), Heloísa Helena (PSOL), and Other (with Lula da Silva (PT) being the omitted category). In 2002: percentage of valid votes for José Serra (PSDB), Anthony Garotinho (PSB), Ciro Gomes (PPS), and Other (with Lula da Silva (PT) being the omitted category). The percentage of invalid votes and the abstention rate are also included for every election. When  $t = 2006$ , the controls  $\Delta_{t-8}^{t-4} PT_r$  and  $\mathbf{V}_{t-8,t}$  are replaced by the percentage of votes for Lula (PT) in 2002.  $\mathbf{X}_{10,t}$  are 'socio-demographics' which refer to the out-of-school adult population (18+) and are measured from the 2010 census. They include: male employment share, female employment share, population (log), male share, nonwhite share, educational attainment shares, share of Bolsa Família or PETI recipients, and share employed in construction sector (1-digit).

## 5. Mechanisms

Our preferred explanation for the local labor market findings is the following: In areas where male employment declines the most, Bolsonaro's authoritarian and masculine stereotypes become more popular among men, as they seek to compensate relative losses in social and economic status. Conversely, in areas where female employment declines the most, men's social and economic status improves in relative terms, shutting off the compensation mechanism, whereas, for women, economic grievances may turn Bolsonaro's rhetoric particularly unappealing or even threatening. In Section 5.1, we present individual-level evidence consistent with our preferred explanation. In Section 5.2, we discuss, test and, ultimately, reject the most prominent alternative mechanisms.

### 5.1. Support for abortion

A concern with the results presented so far is whether the documented gender gap in political preferences at the individual level reflects a compensation mechanism linked to pre-existing gender norms or is driven by other elements present in far-right political platforms. Next, we provide descriptive-level evidence on individual support for abortion, a highly controversial topic central to the debate about gender equality in Brazil.<sup>32</sup>

We rely on five waves of cross-sectional data from the World Values Survey to estimate the individual-level model

$$\text{Support abortion}_i = \beta_m \text{Male}_i + \mathbf{X}_i \gamma + \epsilon_i, \quad (4)$$

where the outcome of interest is a measure of support for abortion running from 0 (abortion is never justifiable) to 10 (abortion is always justifiable). Control variables include age, age squared, race, employment status, educational attainment, marital status, and religion. Regressions are estimated separately for each survey year. For Brazil, interviews took place in 1991, 1997, 2006, 2014, and 2018, with a pooled sample of 7673 respondents.<sup>33</sup> The main parameters of interest are the  $\beta_m$ 's that capture the gender differences in preferences for abortion for each year. In addition, we split our sample between economically satisfied and unsatisfied individuals and plot the male dummy coefficients separately for each year. The results are presented in Fig. 6. We find that, only in 2018, when Bolsonaro runs for president, economically unsatisfied men become relatively more conservative with respect to abortion. Among economically satisfied respondents, in contrast, there is no gender gap in 2018. When we run a placebo analysis for Mexico, in the same period, we find null gender gaps for all groups in all years (see Online Appendix Figure A3).

In sum, in 2018, for the first time since data are available, the average male finds abortion less justifiable than the average female, with the difference fully arising from individuals unsatisfied with their economic situation.

### 5.2. Alternative mechanisms

Because Bolsonaro's political platform was multidimensional, we test the most prominent alternative mechanisms that could also explain the local labor market findings. We consider religion, crime, military affiliation and support for guns, because these were salient elements of Bolsonaro's discourse and could trigger gender divides. In addition, we investigate if heterogeneous migration responses by gender explain the main findings. Finally, we provide suggestive evidence for several other

potential mechanisms that are unobservable at the local labor market level, but for which we have individual survey data from the *AmericasBarometer*. This subsection summarizes the key results presented in Table 4. A detailed discussion of data sources and additional results is available in Online Appendix G.

**Religion.** One prominent feature of Bolsonaro's political platform is its strong ties to the increasingly popular (Neo)-Pentecostal religious movement. His deeply conservative religious views are best captured by his official campaign slogan 'Brazil above everything, God above everyone'.<sup>34</sup> Across microregions, Costa et al. (2023) have shown that the growth in the share of Pentecostals between 2000 and 2010 is positively correlated with the share of votes for Bolsonaro in 2018 (but also with the share of votes for the center-right wing challenger to PT in 2014). If the documented religion effects are gender specific, they could confound our results.

Column 2 of Table 4 reports regression results after controlling for the pre-crisis change in the population shares by religious affiliation between 2000 and 2010. The estimates are in line with the findings of Costa et al. (2023): an increase in the share of Pentecostals positively correlates with Bolsonaro's electoral success in 2018. At the same time, the gender-specific effects of the labor demand shock remain remarkably robust, suggesting that pre-crisis religious trends are not confounding the effects of the economic crisis. Online Appendix G.1 reports additional results with alternative pre-crisis measures of religious demand and supply. The relative gender shock estimates remain fully robust throughout.

We acknowledge that the economic crisis itself might have led to more conversions to Pentecostalism. Costa et al. (2023) show that labor demand shocks in the early 1990s, following Brazil's trade liberalization process, causally increased the share of Pentecostals. Because data on religious affiliation at the microregion level are not available after the 2010 census, we cannot test this potential mechanism directly. However, we note that this mechanism is difficult to reconcile with the gender-specific effects of the economic crisis. At the end of this section, using individual survey data from 2019, we show that controlling for religious affiliation and the frequency of church attendance does not reduce the estimated gender gap in political preferences. Descriptively, thus, religion cannot explain the emergence of a gender gap in political preferences once Bolsonaro runs for President.

**Crime.** During the economic crisis, violent crime increased substantially in Brazil. We collect administrative homicide data from mortality records and assign crimes to microregions by place of death.<sup>35</sup> 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 particularly 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, Column 3 of Table 4 controls for the pre-crisis homicide rate (per 100,000) in 2012 and for the homicide rate change during the crisis (2017–2013). We find that the relative gender shock effect remains robust. Interestingly, the estimates for the crime variables suggest that Bolsonaro

<sup>32</sup> In Brazil, abortion is prohibited by law, exceptionally in cases where the woman's life is endangered or in case of rape or incest. There is a large public debate on the topic, typically led by religious institutions, human rights organizations, and feminist movements.

<sup>33</sup> Further details on the data are presented in Online Appendix D.

<sup>34</sup> Own translation from original: '*Brasil acima de tudo, Deus acima de todos*'.

<sup>35</sup> Data are compiled by the Brazilian Ministry of Health, in the DATASUS-SIM system. 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).

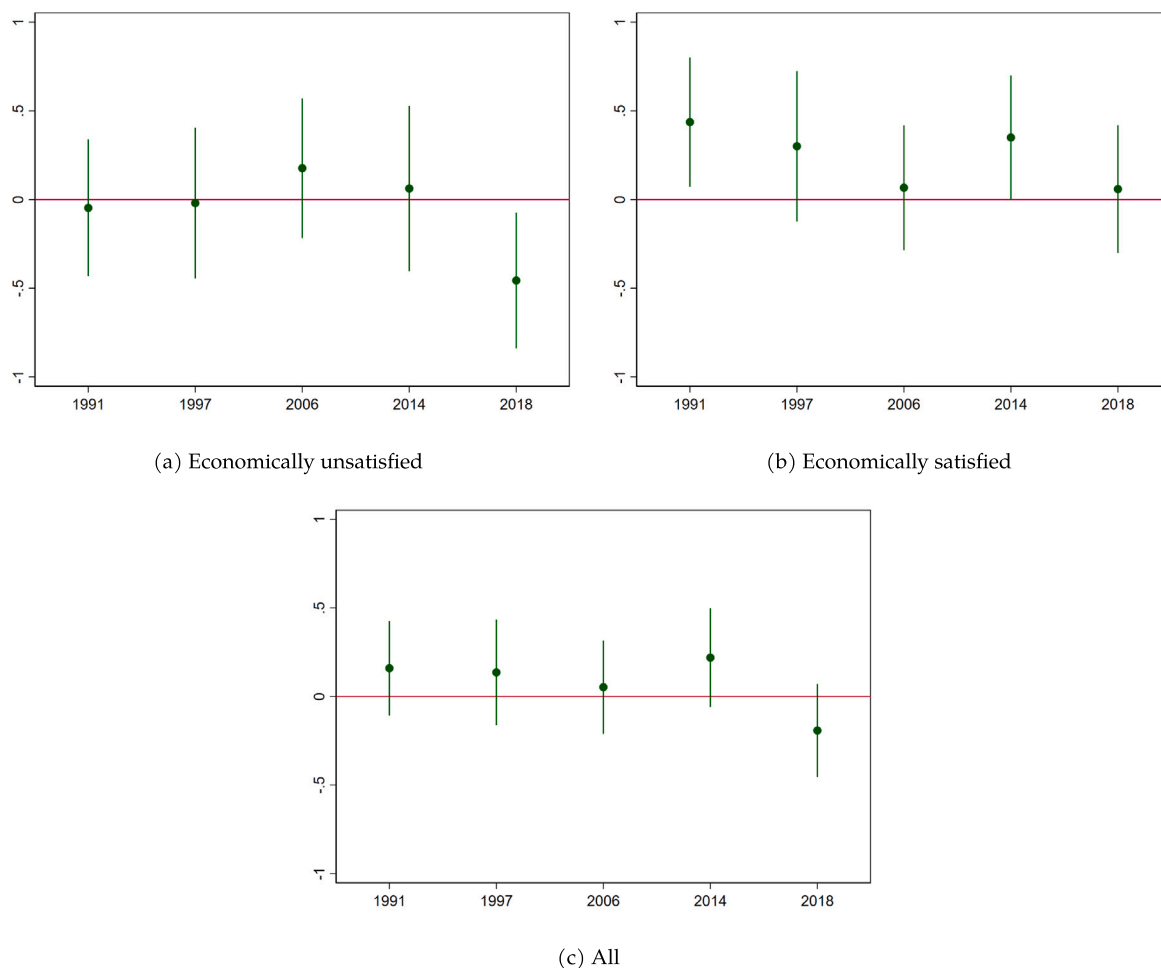


Fig. 6. Individual preferences on abortion, scale (0-10): male dummy estimate, conditional on controls.

Notes: Figure shows male dummy coefficients with 95% confidence intervals. Own calculations from Word Values Survey—Brazil. Control variables are: age, age squared, race, employment status, educational attainment, marital status, and religion. Regression are estimated separately for each survey year.

performed particularly well in microregions that already had high pre-crisis homicides rates. However, there is no additional significant effect of increasing crime rates during the 2013–17 crisis period.

Online Appendix G.2 describes an additional battery of results showing that the increase in crime between 2013 and 2017 does not appear to be explained by the labor demand shock, and that the gender shock effects on electoral outcomes are robust to controlling for crime levels and trends, however measured.

In sum, we find that rising crime is neither a mechanism nor a confounder for the gender-specific economic shocks. Instead, while crime significantly galvanizes support for Bolsonaro, this effect is independent from the relative gender-shock effect.

**Military affiliation and gun support.** We now consider military affiliation and preference for guns as alternative mechanisms. Besides having been part of the military himself, Bolsonaro has openly praised the Brazilian military dictatorship and its practice of torturing and killing dissidents. In addition, Bolsonaro is a fierce defender of laxer gun-ownership laws. Because the military is a male-dominated institution and military service is only compulsory for males in Brazil, we are particularly interested in testing these alternative channels empirically.<sup>36</sup>

<sup>36</sup> In Argentina, where military conscription was drawn by lottery, a recent study finds that “men who were conscripted are less tolerant, more disciplined, more politically conservative, more authoritarian, and more belligerent”. (Navajas et al., 2022, p. 133).

Column 4 of Table 4 augments our baseline model with four additional controls, capturing alignment with the military and support for firearms, all measured at the microregion level: (i) log number of males [(ii) females] drafted to military service between 2013 and 2018; (iii) the employment share of the military from the 2010 census; and (iv) % of ‘No’ votes in the 2005 referendum on the ban of retail sales of firearms and ammunition. Overall, we find no evidence that the estimated gender effect operates through alignment with the military or preferences for guns. Interestingly, however, we find a statistically significant relationship between support for firearms in the 2005 referendum and vote shares for Bolsonaro, suggesting that his pro-gun rhetoric have earned him political dividends in the 2018 election, although this channel operates independently from the exposure to economic shocks. See Online Appendix G.3 for additional results.

**Migration.** Economic shocks may have led to gender-specific migration patterns that shift the political composition of a microregion’s electorate. To test this hypothesis, we collect data on voter registration disaggregated by gender.<sup>37</sup> Column 5 of Table 4 shows that the relative gender-shock estimate is robust to controlling for the change in registered voters by gender between 2014 and 2018 and the pre-crisis share of internal migrants from 2010. Online Appendix G.4 reports further

<sup>37</sup> Unfortunately, because data on internal migration are not available in the AmericasBarometer or World Values Survey, we cannot test if migrants are selected with respect to political preferences.

**Table 4**  
Bolsonaro's vote share, first round, 2018: alternative mechanisms.

	(1) Baseline	(2) Religion	(3) Crime	(4) Military	(5) Migration	(6) All
Male shock–Female shock	0.9191*** (0.2471)	1.0005*** (0.2478)	0.8356*** (0.2448)	0.8893*** (0.2561)	0.8932*** (0.2472)	0.8096*** (0.2527)
$\Delta_{10-00}$ share by religion (Ref. = Catholic)						
None		-11.4226 (17.4554)				-12.3558 (18.6389)
Protestant		-56.4960*** (21.2081)				-57.4947** (25.6963)
Pentecostal		34.9929** (13.7945)				22.6848 (14.7419)
Other		4.4703 (18.3199)				-17.8547 (19.0751)
$\Delta_{17-13}$ log(Crime rate): men			0.3301 (0.4335)			0.2067 (0.4223)
Crime rate: men, 2012			0.0417** (0.0184)			0.0417** (0.0188)
(log) Drafted to military (13-18)						
Males				-0.0041 (0.1189)		0.0224 (0.1200)
Females				-0.3097 (0.3429)		-0.1160 (0.3453)
Military employment share (2010)				17.3482 (29.8662)		12.9865 (32.5748)
Gun referendum: % No (2005)				0.0573** (0.0281)		0.0469 (0.0300)
$\Delta_{18-14}$ log(Registered voters)						
Males					-20.8434 (16.9732)	-19.4110 (17.9291)
Females					22.1649 (21.2070)	22.8833 (22.6075)
Internal migrant share (2010)					27.6851*** (8.7781)	19.0202* (9.9568)

*Notes:*  $N = 558$ . OLS estimates reported with robust standard errors clustered at microregion level shown in parentheses. The outcome is the percentage of votes for Bolsonaro (PSL) in the first round of the 2018 election. 'Male shock–Female shock' is defined as  $\hat{L}_t^m - \hat{L}_t^f$  and measured in standard deviations. Column 2 (Religion): ' $\Delta_{10-00}$  share by religion' is the change in the share of members of each religious group between the 2010 and 2000 censuses. Column 3 (Crime): 'Crime rate: men, 2012' is homicides per 100,000 inhabitants (male victims), in 2012. ' $\Delta_{17-13}$  log(Crime rate): men' is the log difference in crime rates between 2017 and 2013 (male victims). Data are from SUS-SIM. Column 4 (Military): '(log) Drafted to military (13–18)' are the log number of males and females that between 2013 and 2018 were drafted for military service. Data are from the Brazilian Army (EB). 'Military employment share (2010)' is the share of employment in the military, military police, or firefighters, measured from the 2010 census. 'Gun referendum: % No (2005)' is the percentage of 'No' votes in the 2005 national referendum that asked: "Should the sale of firearms and ammunition be banned in Brazil?". Data are from TSE. Column 5 (Migration): ' $\Delta_{18-14}$  log(Registered voters)' is the log difference in registered voters by gender between the 2018 and 2014 elections. Data are from TSE. 'Internal migrant share (2010)' is the share of adult population living in another microregion five years before the 2010 census interview. All regressions control for federal state dummies, 'Socio-demographics', 'Election 2010' and ' $\Delta_{14-10}$  PT, % of votes'. 'Socio-demographics' refer to the out-of-school adult population (18+) and are measured from the 2010 census. They include: male employment share, female employment share, population (log), 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 first round of the 2010 presidential election: percentage of valid votes for José Serra (PSDB), Marina da Silva (PV), Levy Fidelix (PRTB), and Other (with Dilma Rousseff (PT) being the omitted category); percentage of invalid votes (null or blank), and the abstention rate. ' $\Delta_{14-10}$  PT, % of votes' is the change in the percentage of votes for Dilma Rousseff (PT) between the 2014 and 2010 elections, in the first round.

results showing that labor demand shocks did not systematically shift the composition of voters by gender across microregions between 2014 and 2018.

*Summary.* Column 6 of Table 4 introduces all alternative mechanisms simultaneously. In sum, among the most prominent explanations for Bolsonaro's victory, his (Neo)-Pentecostal and tough-on-crime rhetoric appears to have been particularly successful. Nonetheless, these effects are largely independent from – and, thus, unable to adequately explain – the effect of the relative gender shock.

*Other mechanisms.* Finally, we consider several potential mechanisms that are unobservable at the local labor market level, but for which individual data exist in the *AmericasBarometer*. We run a set of regressions using the 2019 wave and show that the gender gap in political preferences retains its order of magnitude after the inclusion of these additional controls: religious affiliation and frequency of church attendance, trust in Congress and in political parties, perceptions of the country's worst problem, and media and social media consumption patterns. The main idea behind this exercise is that if some of the

alternative mechanisms are of first-order importance in driving the gender-specific responses to the economic crisis, then we should expect that their inclusion as individual controls would substantially reduce the magnitude of the gender gap in political preferences that emerges in 2019. Reassuringly, the estimated gender gap remains of similar size across measures of political preferences and specifications. Online Appendix G.5 presents these results in detail.

## 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 helps explaining regional variation in support for 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 have been appealing to men

who, due to the economic shock, perceive a threat to the traditional masculine, breadwinner-type social identity. For women, however, the grievances activated by the economic shock should make this rhetoric particularly unattractive.

We find evidence that in local labor markets where the economic shock hits men harder relative to women, Bolsonaro obtains a higher percentage of votes. This finding supports the interpretation that gender was an important dimension of Bolsonaro's polarizing effect. To the best of our knowledge, this is the first paper linking the heterogeneity in exposure to a labor demand shock by gender to the rise of far-right populism.

We try to disentangle mechanisms in a number of ways. We investigate the role of religion, crime, support for guns, military presence, and migration but conclude that the gender shocks act independently from all these channels. By combining individual-level survey data from the World Values Survey, we show that a large conditional gap in support for abortion emerges among economically unsatisfied respondents in 2018, after Bolsonaro announces his candidacy. This pattern is consistent with the interpretation that a compensation mechanism could be at play.

Beyond the Brazilian context itself, anecdotal evidence suggests that several right-wing populist leaders share conservative views on gender norms and family. Yet, systematic evidence on the recent rise of populism from a gender perspective remains scarce. Our paper, therefore, opens up the possibility for future research studying gender and populism in other contexts. 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.

#### CRedit authorship contribution statement

**Laura Barros:** Writing – review & editing, Writing – original draft, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Manuel Santos Silva:** Writing – review & editing, Writing – original draft, Software, Methodology, Formal analysis, Data curation, Conceptualization.

#### Declaration of competing interest

The authors declare no conflict of interests to report. The research presented in the manuscript was not funded by third-parties.

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#### Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.jdeveco.2024.103412>.

#### Data availability

Data will be made available on request.

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