

Economic Voting in Brazil's Gubernatorial Elections, 1994–2014

Lorena Barberia,* George Avelino,† and Gabriel Zanlorenssi‡

*University of Sao Paulo; lorenarbarberia@usp.br

†Fundação Getulio Vargas- São Paulo; george.avelino@fgv.br

‡University of Sao Paulo; gabrielzanlorenssi@gmail.com

In this article, we provide new evidence that contributes to our understanding of the conditions which influence the existence and degree of economic voting in subnational elections in a multiparty context in a developing democracy. Based on data from Brazilian gubernatorial elections held between 1994 and 2014, we find confirmation, in the case of a developing democracy, of conclusions reached in other studies of developed democracies: that subnational economic voting is moderated by the structure of the state economy and federalism. We show that voters are more likely to reward incumbent governors for their management of the local economy in labor-intensive jurisdictions dominated by industry and services. Economic performance in the year of the election also matters to the degree that a state has more autonomy from the federal government.

A substantial body of research has documented a robust relationship between national macroeconomic performance and election outcomes (Paldman 1991; Lewis-Beck and Stegmaier 2000, 2013). However, local elections do not reveal a similar robust pattern. Part of the difficulty with testing economic voting at the subnational level has to do with disagreements about whether voters cast their ballots in local elections based on national or local economic outcomes (Rodden and Wibbels 2011).

Additionally, there is a robust body of research showing that national performance determines gubernatorial and congressional election outcomes (Stein 1990; Chubb 1988; Peltzman 1987; Ragusa and Tarpey 2016), which challenges theories that postulate local-level economic conditions influence local-level elections (Besley and Case 1995; Ebeid and Rodden 2006; Arvate, Avelino, and Tavares 2009).

In this article, we take advantage of the significant variation that exists in the structure of Brazilian state economies to test a theory of how labor intensity and fiscal autonomy moderate election outcomes in a developing democracy with a highly complex multi-party system. Our study is based on a dataset of 112

governors' elections for the twenty-six Brazilian states between 1994 and 2014. Brazil is a suitable case for several reasons. First, most of what we know about economic voting at the subnational level is limited to cases in industrialized democracies with dominant two-party systems that permeate federal and local elections (Arceneaux 2006; Atkeson and Partin 1995, 2001; Ebeid and Rodden 2006; Anderson 2006; Fortunato, Swift, and Williams 2016; Orth 2001). Indeed, even the limited sets of recent studies that have explored the applicability of economic voting models in subnational elections to developing democracies have continued to test theories in two-party contexts where candidates' parties can be easily labeled as incumbents or challengers (Remmer and Gélinau 2003; Gélinau and Remmer 2006).

Second, there has been a marked decentralization of public policies in Brazil in areas such as health, education, and, more recently, income transfer programs including *Bolsa Família*, affecting a large number of beneficiaries (Arretche 2004, 2005). These programs are implemented by direct agreements between the Union and municipalities, usually through earmarked transfers. As a result, the role of states in coordinating public policies within their territory has been significantly reduced (Fenwick 2009). In such a context, it becomes harder to expect voters to consider local economic conditions in governors' elections, making Brazil a compelling theoretical case to test the electoral importance of local conditions.

Our findings indicate that state-level economic performance affects incumbent governor electoral patterns, but that these effects differ in theoretically expected fashion depending on three factors. First, the *economic structure* of the state's economy matters. We show that economic voting only occurs where the labor-intensive industry and service sectors dominate the state economy. In these settings, voters demand policies to reduce unemployment and governors are active in designing policies to increase jobs. During elections, voters reward incumbent parties who reduce unemployment. Second, economic voting is more likely to occur in states that finance their activities through self-generated tax revenues. Third, voters assess current state performance in *temporal and relative terms*. Our results show that voters compare local economic outcomes relative to the immediate past, and that they filter nation-wide shocks. Incumbents are rewarded if the over-the-year change in the rate of unemployment improves and if this improvement is above the national average.

Theoretical Framework

In this section, we develop our theoretical framework to explain how economic performance impacts local electoral accountability. Our explanation relies mostly on Ebeid and Rodden (2006), who argue that voters use standard economic indicators, such as unemployment and growth rates, to evaluate incumbents in



Economic Voting in Brazil's Gubernatorial Elections, 1994–2014

Lorena Barberia,* George Avelino,† and Gabriel Zanlorenssi‡

*University of Sao Paulo; lorenabarberia@usp.br

†Fundação Getúlio Vargas - São Paulo; george.avelino@fgv.br

‡University of Sao Paulo; gabrielzanlorenssi@gmail.com

In this article, we provide new evidence that contributes to our understanding of the conditions which influence the existence and degree of economic voting in subnational elections in a multiparty context in a developing democracy. Based on data from Brazilian gubernatorial elections held between 1994 and 2014, we find confirmation, in the case of a developing democracy, of conclusions reached in other studies of developed democracies: that subnational economic voting is moderated by the structure of the state economy and federalism. We show that voters are more likely to reward incumbent governors for their management of the local economy in labor-intense jurisdictions dominated by industry and services. Economic performance in the year of the election also matters to the degree that a state has more autonomy from the federal government.

A substantial body of research has documented a robust relationship between national macroeconomic performance and election outcomes (Paldman 1991; Lewis-Beck and Stegmaier 2000, 2013). However, local elections do not reveal a similar robust pattern. Part of the difficulty with testing economic voting at the subnational level has to do with disagreements about whether voters cast their ballots in local elections based on national or local economic outcomes (Rodden and Wibbels 2011).

Additionally, there is a robust body of research showing that national performance determines gubernatorial and congressional election outcomes (Stein 1990; Chubb 1988; Peltzman 1987; Ragusa and Tarpey 2016), which challenges theories that postulate local-level economic conditions influence local-level elections (Besley and Case 1995; Ebeid and Rodden 2006; Arvate, Avelino, and Tavares 2009).

In this article, we take advantage of the significant variation that exists in the structure of Brazilian state economies to test a theory of how labor intensity and fiscal autonomy moderate election outcomes in a developing democracy with a highly complex multi-party system. Our study is based on a dataset of 112

Publius: The Journal of Federalism, pp. 1–21

doi:10.1093/publius/pjy017

© The Author(s) 2018. Published by Oxford University Press on behalf of CSF Associates: Publius, Inc.

All rights reserved. For permissions, please email: journals.permissions@oup.com

governors' elections for the twenty-six Brazilian states between 1994 and 2014. Brazil is a suitable case for several reasons. First, most of what we know about economic voting at the subnational level is limited to cases in industrialized democracies with dominant two-party systems that permeate federal and local elections (Arceneaux 2006; Atkeson and Partin 1995, 2001; Ebeid and Rodden 2006; Anderson 2006; Fortunato, Swift, and Williams 2016; Orth 2001). Indeed, even the limited sets of recent studies that have explored the applicability of economic voting models in subnational elections to developing democracies have continued to test theories in two-party contexts where candidates' parties can be easily labeled as incumbents or challengers (Remmer and Gélinau 2003; Gélinau

and Remmer 2006).

Second, there has been a marked decentralization of public policies in Brazil in areas such as health, education, and, more recently, income transfer programs including *Bolsa Família*, affecting a large number of beneficiaries (Arretche 2004, 2005). These programs are implemented by direct agreements between the Union and municipalities, usually through earmarked transfers. As a result, the role of states in coordinating public policies within their territory has been significantly reduced (Fenwick 2009). In such a context, it becomes harder to expect voters to consider local economic conditions in governors' elections, making Brazil a compelling theoretical case to test the electoral importance of local conditions. Our findings indicate that state-level economic performance affects incumbent governor electoral patterns, but that these effects differ in theoretically expected fashion depending on three factors. First, the *economic structure* of the state's economy matters. We show that economic voting only occurs where the labor-intensive industry and service sectors dominate the state economy. In these settings, voters demand policies to reduce unemployment and governors are active in designing policies to increase jobs. During elections, voters reward incumbent parties who reduce unemployment. Second, economic voting is more likely to occur in states that finance their activities through self-generated tax revenues. Third, voters assess current state performance in *temporal and relative terms*. Our results show that voters compare local economic outcomes relative to the immediate past, and that they filter nation-wide shocks. Incumbents are rewarded if the over-the-year change in the rate of unemployment improves and if this improvement is above the national average.

Theoretical Framework

In this section, we develop our theoretical framework to explain how economic performance impacts local electoral accountability. Our explanation relies mostly on Ebeid and Rodden (2006), who argue that voters use standard economic indicators, such as unemployment and growth rates, to evaluate incumbents in

states where the performance of the local economy depends on factors controlled by the incumbent. In the United States, these authors show that voters do not hold incumbents accountable for economic performance in states dominated by agriculture and natural resources because these sectors tend to depend on factors mostly outside the control of the incumbent (e.g., international commodity price fluctuations and the weather). Instead, voters pay attention to state-level economic conditions in regions that are less reliant on these primary economic sectors. We take a different, albeit complementary, perspective. We focus on labor intensity and its relation to the sectoral specialization of a state's economy and the degree to which states are autonomous from the federal government.

Concerning the economic structure of the state's economy, we conjecture that the density of labor causes unemployment preferences to diverge between rural and urban voters. Rural farmers and civil servants have different interests concerning economic policy and its impact on unemployment as compared to workers in the industrial and service sectors. Workers employed in these sectors live in cities where there is a higher supply of jobs, but where they also know that jobs, especially formal sector ones, are relatively scarce (de Oliveira 2006). For these workers, unemployment figures provide a meaningful signal of the likelihood of getting a job and the value of a current job in relative terms. Rural workers, in contrast, are more concerned with selling crops, and the factors that will impact their yields—commodity prices and the weather. Agricultural workers living in small cities also experience job stability and lower unemployment rates (de Oliveira 2017), even if earnings are more meager and suffer from seasonality. Similarly, the public sector in Brazil also benefits from job security and relatively high salaries (Marconi 1997; Moriconi et al. 2009). In this sense, the impact of improvements in economic performance on incumbent performance depends on labor intensity in the geographical locality where voters reside.

The Brazilian economy has traditionally based its development trajectory on labor-intensive production (Baer 2008). Throughout the 20th century, the country underwent a dramatic structural transformation that has caused a shift in labor towards nonfarm employment. Across all states, the most significant drivers of employment creation and destruction are the service and industry sectors. Those states with higher concentrations of workers in the service and industrial sectors, such as the large and intermediate size cities in the states of Sao Paulo and Rio de Janeiro, have higher labor densities, the highest rates of unemployment, and the highest share of formal workers (de Oliveira 2013) (see Supplementary Appendix A1 and A2).

In these localities, where the industrial and service sectors are dominant sources of employment, state governments are actively engaged in designing policies towards building a more skilled workforce (Silva, Almeida, and Strokova 2015; Cohn 2012). In the State of Sao Paulo, for example, the State Government has

multiple training programs in operation including *Frente de Trabalho* targeting the training of the unemployed, *Aprendiz Paulista* providing technical courses and support for those seeking employment between fourteen and twenty-four years of age, and *Emprego São Paulo* that links those seeking jobs with opportunities in the State.¹ We conjecture that employment indicators are meaningful sources of information for voters to evaluate incumbent gubernatorial performance in these states.

In contrast, in states where the economy largely depends on agriculture and natural resources and the public sector, local economic performance indicators are less informative to voters. Natural resource-based industries, including agriculture, employ a smaller share of the population and overall, a lower share of female voters are active participants in the labor force (de Oliveira 2017). They also generate few new jobs. Moreover, industry and services are much smaller in these states as, on an average, sixty-five percent of rural jobs are in agriculture. In these settings, economic booms and busts have a limited impact on employment. Therefore, we posit:

H1: The vote for the incumbent governor's party will be positively related to state-level economic performance indicators in labor-intensive regions.

The second factor that conditions the extent to which voters reward governors for improved local economic performance is the degree of a state's fiscal autonomy. In institutional contexts of multilevel governance, such as the case of Brazil, the process whereby citizens correctly assign responsibility for economic outcomes to the federal, state, and municipal government can be challenging (Anderson 2006). The prevailing view in the literature (Rodden 2004; Rodden and Wibbels 2011) is that voters can identify policy domains under each government-level responsibility in democracies with a "layer cake" federalism design. In democracies with a "marble cake" federalism design, such as the case for Brazil, voters may be less able to assess government performance. In these arrangements, the policy domain boundaries between government levels should be blurred leaving voters unable to assess local government performance.

Building on the clarity of responsibility framework (Powell and Whitten 1993) that shows voters are more likely to hold governments accountable for national economic outcomes when political and institutional horizontal accountability is clear, there is increasing evidence that vertical accountability still occurs in multilevel governance settings (Anderson 2006, 2008; Orth 2001; Atkeson and Partin 1995). There is public opinion survey data which confirms that Brazilian voters recognize shared responsibilities across units of the federation for public policies, but attribute greater responsibility to the appropriate level of government by type of public services (Confederação Nacional de Indústrias [CNI] 2011). Again, we take a complementary perspective by adding fiscal federalism and the level of fiscal autonomy. We posit that voters will care more about the state

government performance in-as-much it has to fund its policies with local taxes (Alt and Lowry 2010; Besley and Case 1995). In other words, as governors cannot shift the financial burden of their policies to the federal government through federal transfers, they need to increase local taxes, raising voters' attention to their performance.

In the case of Brazil, although Brazilian subnational governments lack independent taxing authority (Arreche 2005), state governments have considerable autonomy in setting and collecting the largest and most important value-added tax (the *Impostos sobre Comercialização de Mercadorias e Serviços* or ICMS) (Junqueira 2010). States that generate a higher share of their revenues from local taxes will have a higher share of resources at their disposal to enact policies, but these tax increases will also be visible to voters and firms.

Fortunately for hypothesis testing, the autonomy of states in Brazil is not uniform (Rezende 2007). In some states, large intergovernmental transfers (Ter-Minassian 2012) make it difficult for voters to assess state governments' performance. This problem is particularly acute for the states of the North and Northeast of Brazil, whose budgets are highly dependent on federal transfers. It is less so for the states in the South and Southeast as state governments in these regions are not dependent on federal transfers to finance their operations. According to our theoretical expectations, we suggest:

H2: The vote for the incumbent governor's party will be positively related to state-level economic performance indicators in more fiscally autonomous regions.

The Election of Governors in Brazil

Brazil has held direct and competitive elections for state governors since 1982 (Samuels and Abrucio 2000). Since 1994, presidential and gubernatorial elections occur concurrently. Voting is compulsory in Brazil, and election rules are defined by a national Electoral Justice Court (*Tribunal Superior Eleitoral*—TSE) with no variation among states. A total of 156 gubernatorial elections were held in the twenty-six states of Brazil between 1994 and 2014.² We only analyze cases in which the *incumbent party* or the *incumbent governor* ran for reelection.³ In these 112 elections, the *same political party and/or the same governor* was reelected in seventy-one (63 percent) of these elections.

As table 1 shows, incumbent candidates fare much better in reelection prospects as compared to successors who run in incumbent parties. Brazilian governors could only run for reelection from 1998 onwards. Forty-nine incumbent governors sought reelection in the same political party in which they were elected in their first-term, and of these, 69 percent secured a second term. After the return of democracy in 1988, there has been a significant political re-alignment in Brazil. As

Table 1 Brazilian gubernatorial elections by type of candidacy and reelection outcome, 1994–2014

	1994	1998	2002	2006	2010	2014	Total							
No. of Relected candidates (%)	1994	1998	2002	2006	2010	2014	Total							
No. of Relected candidates (%)	1994	1998	2002	2006	2010	2014	Total							
Incumbent														
Ran for reelection for the same party as first-term	0	12	67	6	67	12	56	9	78	10	70	49	69	
Ran for reelection for another party	0	–	4	100	0	–	4	100	0	–	1	100	9	100
Partisan														
Candidate participated in the election and headed the coalition	15	53	6	50	14	57	6	50	6	67	7	43	54	54
Total	14	50	22	68	20	60	22	68	15	73	18	61	112	63

Source: Compiled by authors based on data from TSE and IUPERJ.

as a result, many new political parties were created. Nine governors switched parties and ran for reelection under a new party. The majority of these cases (eight of nine) occurred during the reelection bids of the President (Fernando Henrique Cardoso in 1998 and Luiz Inácio "Lula" da Silva in 2006), with governors switching to political parties closer to the President seeking a second term. In all of these cases, the incumbent governor was reelected under the new political party. If the governor elected in the previous election stepped down or died, and a successor assumed control and sought reelection, the reelection rate was significantly lower (52 percent).

Similar to patterns found in the United States, Canadian, German, and Argentine federations (Rodden and Wibbels 2011), the political parties that are the primary front-runners in presidential elections have the highest success rate in winning governorships (Limongi and Cortez 2010). Indeed, three political parties, the *Partido da Social Democracia Brasileira*-PSDB, the *Partido do Movimento Democrático Brasileiro*-PMDB, and the *Partido dos Trabalhadores*-PT, won two-thirds of all gubernatorial elections. However, although Brazilian gubernatorial elections coincide with presidential elections, there is limited evidence of presidential coattails (Barone and Avelino 2013). Instead, certain political parties have persistent strongholds on the governorships of particular states.⁴ Fernando Henrique Cardoso's coalition (headed by the *Partido da Social Democracia Brasileira*-PSDB) secured Central and Western states in addition to his home state of Sao Paulo in the 1994 and 1998 elections. These same regions were never secured by Luiz Inácio "Lula" da Silva of the Workers Party (*Partido dos Trabalhadores*-PT), although he managed to secure a few states in the Northeast, a pattern that Dilma Rousseff repeated and increased in 2010 and 2014. In the North and Central regions, on the other hand, governorships are distributed across a more extensive number of political parties, albeit these never surpass four political parties alternating power in a given state.

The Geography of Economic Development in the Brazilian States

The 1990s marked the beginning of transformations of great consequence to the Brazilian economy (Baer 2008). Starting in 1990, Brazil adopted trade liberalization that resulted in massive restructuring of its industrial sector. Hyperinflation was successfully eliminated with the successful introduction of the *Plano Real* in 1994 and inflation, though persistent, was stabilized. The federal government also undertook stabilization policies to improve fiscal balances. In light of the economic adjustment that ensued from these policies, the decade of the 1990s was characterized by significant macroeconomic volatility, lackluster growth, and unemployment. Within this context, regional inequalities solidified (Shankar and Shah 2003; Resende et al. 2015).

In the early 2000s, the Brazilian economy seemed to be making a turnaround (Love and Baer 2009). Real GDP growth rates recovered, and the availability of jobs and decent wages improved. Historic regional disparities (Barberia and Biderman 2010) were reduced as industrial concentration fell and the federal government collaborated with states to launch major regional development programs in more impoverished regions (Schettini and Azzoni 2013). Traditional industries in the Metropolitan Region of Sao Paulo (RMSP) moved inwards within the state (including São José dos Campos), and new industrial centers emerged in the states of Minas Gerais (in Belo Horizonte and Uberlândia), Paraná (Londrina and Maringá), Rio Grande do Sul (Porto Alegre), and Santa Catarina (Florianópolis). In the North and Northeast of Brazil, large-scale infrastructure projects funded by the Brazilian National Development Bank (BNDES) worked to finance the development of the petrochemical, naval, wind, steel, railway, oil refinery, pulp, and automobile sectors. The states of Bahia, Ceará, and Pernambuco experienced growth spurts driven by these investments.

The 1990s and 2000s were markedly painful in terms of the fiscal performance of states (Ter-Minassian 2012). Facing unsustainable fiscal situations with high levels of spending on personnel and dangerous levels of borrowing, several Brazilian states were pushed into debt servicing crises in the 1990s. Bailout agreements were signed between states and the federal government. As part of these agreements, state enterprises and state-owned banks were privatized. In the 2000s and 2010s, state governments have continued to struggle to meet fiscal balances, and limited public investments have been undertaken to meet gapping infrastructure gaps (Barberia and Avelino 2015).

Though marked regional differences have persisted throughout the last three decades, there has been considerable variation in economic performance at the state-level. This variation is seen clearly by comparing the over-the-year changes in unemployment across states as we do in figure 1. Unemployment is calculated based on data reported in the PNAD (*Pesquisa Nacional de Amostra de Domicílios*), an annually applied household survey that is collected by the IBGE. Several features stand out. First, there is a significant variation in the reduction of unemployment across states, and there is no one region that seems to outperform the other regions. Instead, the cases of reductions of unemployment occur in isolated cases within regions in most elections. In 2014, the state of Santa Catarina managed to reduce unemployment, but neighbor states (Paraná and Rio Grande do Sul) were less fortunate. Second, there is a significant variation across time within each state. The states with unemployment performance above average were not necessarily the same states in all elections.

Figure 2 presents the distribution of the share of each state's economy devoted to industry (including manufacturing, construction, and utilities) and services in each gubernatorial election year.⁵ Overall, the service sector is the most prominent

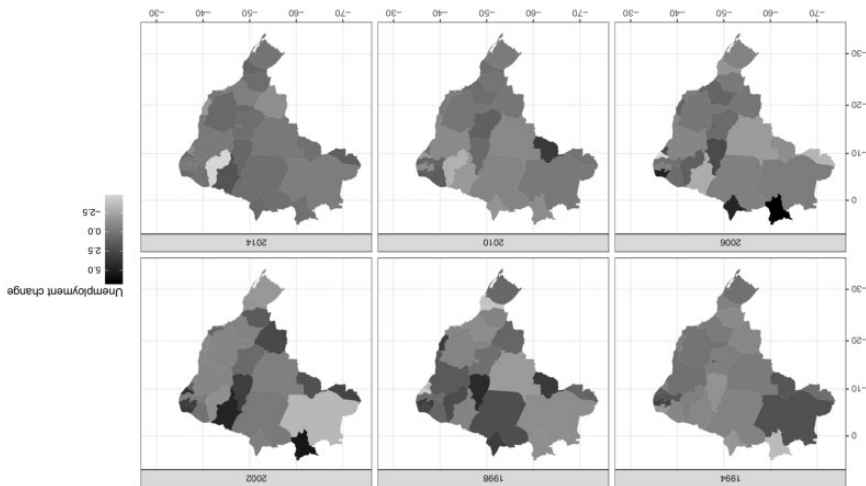


Figure 1 Change in benchmark unemployment in the year of the election, 1994–2014.

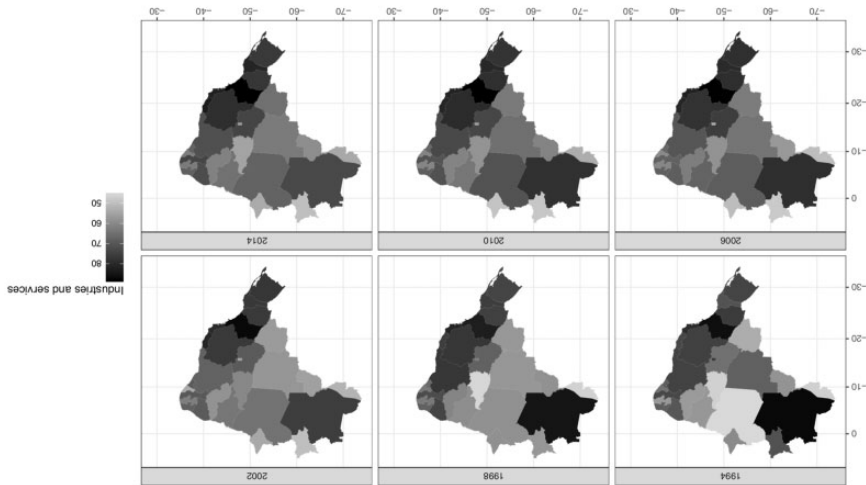


Figure 2 Industry and services as a share of state GDP, 1994–2014.

sector of the economy (47 percent in 2014), followed by the public sector (24 percent), industry (21 percent), and agriculture (7 percent). The states that are shaded darkest are the states with higher state GDP shares devoted to industry and services (versus public sector and agriculture). The lightest gray states are those who have relatively smaller industrial and service economies. In most cases, the darker-shaded states are the well-known industrial core of Brazil in the South and

Southeast with one-third of the nation's industrial production in São Paulo state. Landlocked Brazilian states, such as Mato Grosso do Sul and Goiás, improved their growth trajectories. However, these states remain primarily dependent on the public sector and agriculture. Moreover, as we discuss in further detail below, a state's ability to collect taxes depends on the structure of the economy. Those economies that are more labor-intensive are also the economies who tend to have a larger share of industries and other large firms, which are easier to tax.

Empirical Results

To test our hypotheses, we construct a model of state-level economic voting. Table 2 presents the results of how economic performance influences incumbent vote performance with standard errors clustered at the state level (see [Supplementary Appendix A5](#) for variables, sources, and definitions).⁶ The dependent variable in our analysis is the percentage of votes received by the political party of the incumbent government in the first round of the election (or the only round, if there is not a runoff).⁷ The vote share received by the incumbent government party in the prior election is included as a control. As expected, the coefficient on the previous vote share is positive and statistically significant (99 percent confidence interval) across all specifications implying that higher vote shares for incumbent parties in the past election result in higher vote shares in the current election. Moreover, if the incumbent candidate seeks reelection, the results consistently show the vote share will be roughly 10 percent higher (99 percent confidence interval).⁸

To verify robustness, we present the results using two measures of change in state unemployment.⁹ Both measures were calculated based on unemployment data as reported in the PNAD (*Pesquisa Nacional por Amostragem de Domicílios*), an annually applied household survey collected by the IBGE. The first measure, Δ UNEMPLOYMENT represents the percentage change in the level of unemployment in a state in the year of election as compared to the prior year (column one, [table 2](#)). This measure captures the relative temporal change in unemployment within the state. The second measure Δ BENCHMARK UNEMPLOYMENT is a benchmark measure. It represents the difference in the unemployment rate in a state in the year of the election as compared to the national unemployment rate (column two, [table 2](#)). A positive value for national unemployment indicates the state is performing above the national average.

Labor Intensity

We theorized that governors who reduce the state unemployment rate should be rewarded differently depending on labor intensity, which we measure using the size of the state's economy devoted to industry and services. Given that our theory is

Table 2 The effects of local economic performance on the incumbent party vote share

	(1)	(2)	(3)	(4)
Vote share _(t-1)	0.406*** (0.11)	0.381*** (0.11)	0.422*** (0.11)	0.404*** (0.11)
Incumbent	10.381*** (2.85)	10.290*** (2.79)	9.964*** (2.77)	9.830*** (2.73)
Δ Unemployment	9.039* (5.04)	0.437** (1.41)	1.607 (1.41)	0.418** (1.41)
(Industry+Services)/GDP	0.409** (0.19)	0.437** (0.19)	0.405** (0.20)	0.418** (0.19)
Δ Unemployment × (Industry+Services)/GDP	-0.170** (0.08)	-0.344** (0.13)	-0.316** (0.13)	-0.319** (0.13)
Tax revenue/Total revenues	-0.335** (0.13)	-0.344** (0.14)	-0.316** (0.13)	-0.319** (0.13)
Δ Benchmark unemployment	-10.255 (6.04)	-10.255 (6.04)	-10.255 (6.04)	-1.733 (1.53)
Δ Benchmark unemployment × (Industry+Services)/GDP	0.190* (0.10)	0.190* (0.10)	-0.086** (0.04)	-0.088* (0.05)
Δ Benchmark unemployment × Tax revenue/Total revenues	7.925 (11.10)	7.998 (10.97)	6.997 (11.25)	6.946 (11.19)
Constant	7.925 (11.10)	7.998 (10.97)	6.997 (11.25)	6.946 (11.19)
R ²	0.325	0.266	0.278	0.252
Number of observations	112	112	112	112
Root mean square error	0.136	0.138	0.137	0.140

Notes: Clustered standard errors in parenthesis; * $P < 0.10$, ** $P < 0.05$, *** $P < 0.01$.

about this interaction, we evaluate the results of the estimates reported in table 2 considering the marginal effect of changes in unemployment, conditional on the degree of labor intensity of the state's economy (Brambor, Clark, and Golder 2006).

Figure 3 depicts the marginal effect of how changes in unemployment influence the governor's vote share for varying degrees of labor intensity based on the coefficient estimates obtained from the regression model in column one of table 2. The gray-shaded histograms depicts the distribution of the size of the service and industrial sectors in the sample. The measure of the share of industry and services as a share of the state's GDP is based on data released by the *Instituto de Pesquisa Econômica Aplicada* (IPEA). On average, industry and services represent 68.5

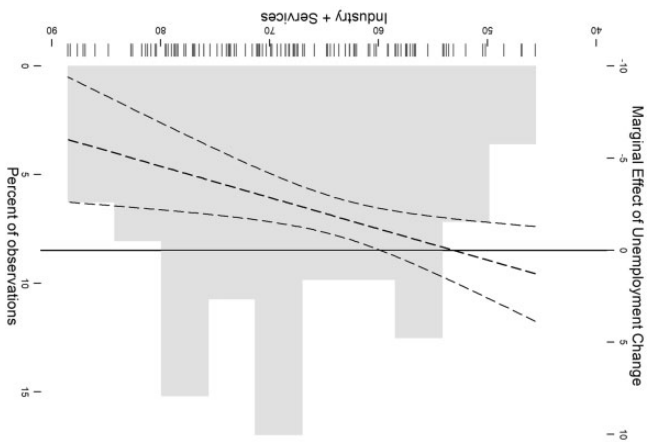


Figure 3 Marginal effect of change in unemployment on incumbent party vote share (given changes in labor intensity).

Note: — is the 90% confidence interval.

percent of the state economy, but there are states where these sectors are as little as 45 percent, such as Tocantins. In contrast, industry and services are an average of 88 percent of Sao Paulo's economy. The marginal effect of the percentage change in unemployment is negative and statistically significant when the industrial and service sectors surpass 60 percent of the state economy (figure 3).

To assess the implications of this finding, we use *Clarify* to interpret the coefficients of the multivariate regressions (King, Tomz, and Wittenberg 2000).¹⁰ Consider the case in which the explanatory variables are set to the sample mean and labor intensity is above average (one standard unit deviation above the mean). In the average state, the party of the incumbent governor running for reelection earned 49.7 percent of the vote in the prior election, and the unemployment rate is -0.32 percent lower than the previous year. Taxes represent 51.5 percent of total state revenue. If industry and services comprise 80 percent of the state's economy (slightly above one standard unit deviation from the mean), how will one standard deviation change in unemployment in the year of election influence the governor's reelection bid? In the case in which unemployment worsens relative to the year prior, the model predicts that the governor's party will have a higher probability of losing the election. All else equal, the governor's party will earn between 41.6 and 52.7 percent of votes (95 percent confidence interval). However, if the state experiences a decrease in unemployment by one standard deviation in the year of the election, she will increase her chances of winning the election. In this scenario, the model predicts that she will earn between 55.0 percent and 72.4 percent (95 percent confidence interval) of votes.

The rewards to governors who reduce unemployment are also confirmed when we evaluate the impact of unemployment on incumbent vote shares using a benchmark measure that allows us to compare the state's performance with the national average for all 26 states (column two, table 2). Before presenting the results of model 2, it is helpful to explain our measurement of the relative change in unemployment. If a state's unemployment rate is 10 percent and the nation's unemployment rate is 5 percent, our measure of the relative change in unemployment will be negative indicating that the state is performing below the national average. On the other hand, a positive value indicates the state is performing above average, or decreasing unemployment more than the national average.

The results reported in column two of table 2 confirm that states which reduce unemployment above the national average are rewarded with higher votes for the incumbent party candidate, but only if the state's economy is relatively more labor-intensive. In turn, the results indicate that unemployment changes do not impact incumbent vote shares in states where the agriculture and public sector comprise 55 percent or more of the state economy. Figure 4 exemplifies the effects of improving unemployment by depicting the predicted vote share from varying levels of unemployment performance (in relation to the national average) in a labor-intensive state where the state's industrial and service economy is 80 percent of GDP. In this figure, the predicted vote share for the incumbent party was calculated based on the assumption that the incumbent is running after having received 49.7 percent of votes in the last election in a state that collects 51.5 percent of its revenue from taxes (the sample means). There are significant rewards for governors who improve unemployment relative to the national baseline in labor-intensive economies. All else equal, a governor running for reelection in a state that has one standard deviation lower unemployment as compared to the national average will earn between 55.1 percent and 74.3 percent of votes (95 percent confidence interval). In contrast, the same magnitude of difference in the opposition direction (e.g., when the state performs below the national average) yields a predicted vote share ranging from 40.3 to 53.6 percent of votes for the incumbent (95 percent confidence interval).

Our results show that better local economic conditions enhance incumbent victories at the state-level in Brazil. By using a benchmark measure of unemployment, we are now able to show evidence that voters not only punish local incumbents when unemployment increases in the year of election, they also filter nation-wide shocks as they assess economic conditions in more labor-intensive economies. In states that reduce unemployment below or slightly below the national average, incumbent parties will be rewarded with a higher share of the vote, but this effect is conditional on the state's economy being oriented towards the industrial and service sector. In turn, incumbents will be punished in states

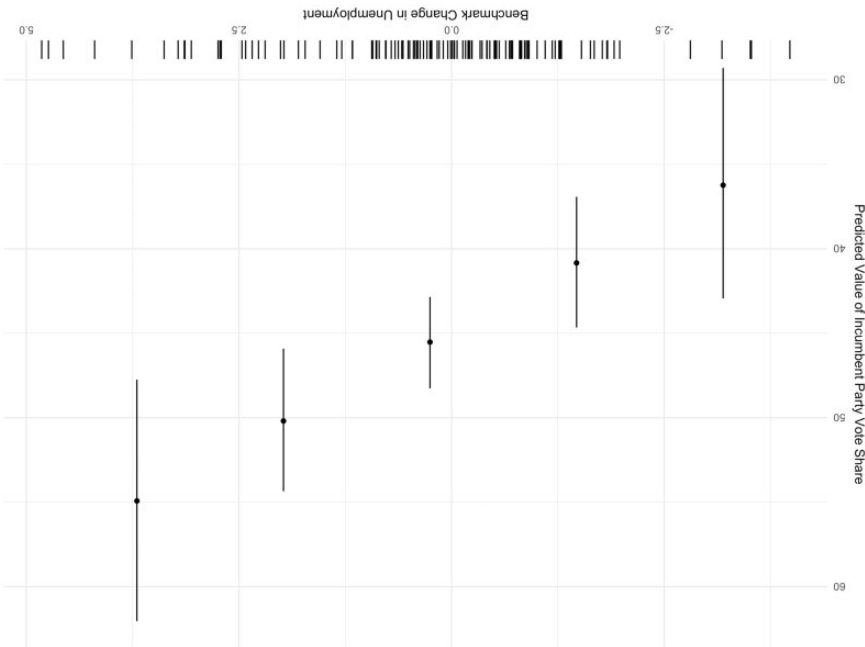


Figure 4 Predicted incumbent vote share for changes in benchmark unemployment in labor-intensive economies.

Note: The shaded bars on the horizontal axis represents the distribution of cases. The black dot is the point estimate and the line is the 95% confidence interval.

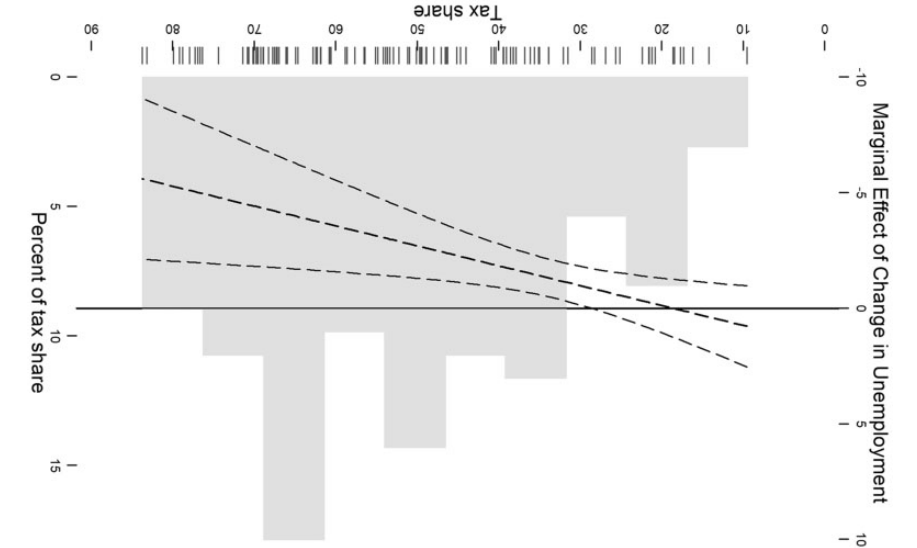
whose unemployment levels increase above or slightly above the national average, but this accountability depends on the degree to which the state's economy has a higher concentration of labor-intensive economic activity.

Fiscal Autonomy

Our theoretical framework has posited that the impacts of state-level economic performance on the incumbent vote depends on the state's fiscal autonomy from the federal government. In the remaining two specifications reported in [table 2](#) (column three and four), we report the coefficient estimates of the regression with an interaction term to test if improvements in unemployment differ by the degree to which a state is fiscally autonomous from the federal government (as opposed to dependent on federal grants). The results confirm that the marginal effect of unemployment on the incumbent vote share is conditional on the state's capability to generate a more significant share of its revenue from taxes (as opposed to depending on federal transfers to finance operations).

Figure 5 Marginal effect of change in unemployment on incumbent party vote share (given changes in fiscal autonomy).

Note: The gray area represents the distribution of cases. — is the 90% confidence interval.



In figure 5, we observe the marginal effect of changes in unemployment on the change in the vote share, conditional on how much of the state's revenue is self-generated. Voters punish incumbent governors when unemployment increases, but this effect only occurs in states that are more autonomous from the federal government. To illustrate these substantive effects, we will return to the same scenario as before. In a state where the incumbent governor earned only 49.7 percent of the vote in her first term, and who is running for reelection, taxes represent 51.5 percent of the total state revenue. We will now examine the effects of changes in unemployment in a more fiscally-autonomous state where taxes represent 70 percent of the state revenue (one standard deviation above the mean). We again use *Clarity* to calculate the average effects on the incumbent vote share using 1000 Monte-Carlo simulations from a change in unemployment performance based on the coefficient estimates obtained in model 3. In the state with high fiscal autonomy and average labor intensity (e.g., where industry and services are seventy percent of state GDP), the governor will earn between 31.9 and 42.5 percent of votes (95 percent confidence interval) when there is a one standard deviation increase in the unemployment rate. In contrast, the governor will earn between 44.2 and 62.1 percent of votes (95 percent confidence interval) in a more fiscally autonomous state where these effects are confined when the effects of changes in unemployment in the state unemployment is reduced by one standard

deviation. These findings are also confirmed when the effect of changes in the unemployment contingent on the share of state revenues generated from taxes are evaluated using a benchmark measure of unemployment (see [Supplementary Appendix A7](#)).

Thus far, our empirical results have confirmed our theoretical expectations. However, it is essential to underscore that our theoretical framework suggests that the economic vote is jointly conditional on labor intensity (measured by the share of the state economy devoted to industry and services) and state autonomy. Therefore, a logical next step would be to test our theory using a three-way interaction model. Among these, the model most suited for our theory is a chained-interaction model (Franzese and Kam 2007). This is because our theory is the extent to which economic performance contributes to incumbent accountability depends on labor intensity and state autonomy, but we do not have a theoretical claim about the relationship between these factors, even though the case of Brazil suggests that they are highly correlated.

However, given the limited number of elections that have taken place since Brazil's return to democracy, there is insufficient variation in our sample to test the full implications of our theory. This is because the states that are the most labor-intensive are also the same governments that collect higher revenues from taxes. Indeed, the correlation coefficient between labor intensity and fiscal autonomy is 0.80 in our sample. The preliminary results from a chained-interactive model (and the results of the joint hypothesis test that the coefficients on labor intensity, unemployment, and state autonomy are jointly equal to zero and the marginal effects are statistically significant) confirm our theory as the sign and magnitude are in agreement with our predictions. We do not present these results, however, as the standard errors suffer from high multicollinearity.

Conclusion

In this study, we have contributed to an understanding of economic voting for gubernatorial elections in Brazil. One of the largest democracies in the world, Brazilian heterogeneity provides a useful test case for the literature on subnational economic voting and accountability. Despite the changes in the Brazilian federation during the last decades, which led many to delink local performance and voters' choices, our results consistently show that subnational elections in Brazil conform to accountability patterns found in developed democracies. There are rewards to incumbent governors for improving economic performance at the state-level, but the degree to which parties receive higher vote shares during reelection bids is moderated by the labor intensity of the state economy and federalism. In states where the labor-intensive industry and service sectors dominate the local economy, voters reward incumbent parties who reduced

unemployment in the year of election and relative to the national average. Likewise, we have also shown that economic voting is more likely to occur in states that are relatively more fiscally autonomous from the federal government. These findings advance our comprehension about how accountability works in a complex federalist arrangement such as the Brazilian one. The prevailing view in the literature (Rodden 2004; Rodden and Wibels 2011) is that voters can identify policy domains under each government level responsibility in democracies with a “layer cake” federalism design. In democracies with a “marble cake” federalism design, such as the case for Brazil, voters may be less able to assess government performance. In these arrangements, the policy domain boundaries between government levels should be blurred, leaving voters unable to assess local government performance. Our results allow a more optimistic view on democratic accountability in these complex contexts.

Supplementary Data

Supplementary data are available at *Publius: The Journal of Federalism* online.

Notes

The authors thank the anonymous reviewers for their valuable comments on an earlier draft, as well as Victor Shin, Murilo Junqueira, Ingrid Castro, and Luiz Guilherme Roth Cantarelli for their excellent research assistance. George Avelino and Lorena Barbetta acknowledge grant support from Fapesp (2013/15658-1). Gabriel Zanlorenssi acknowledges an undergraduate research fellowship from Fapesp (2015/25070-7).

1. A description of these initiatives is available at: <https://www.empregasasapaulo.sp.gov.br/>.
2. This study is limited to the elections from 1994 onwards. Under military rule, elections restricted voters' choices to legislative offices (local and national) and all candidates were obligated to belong to one of two parties. These parties were ARENA (*Aliança Renovadora Nacional*), which was the government-endorsed party, and the MDB (*Movimento Democrático Brasileiro*), which was the opposition party. In this period, the corresponding legislative bodies elected the president, the governors, and mayors. The imposed two-party system was introduced in 1967 and terminated in 1979. The Brazilian Congress promulgated a new Constitution in 1988 and important aspects of the relation between central and local governments changed. As a result, the party system passed through an intense process of party differentiation before the 1989 presidential elections. For these reasons, the party system was not completely established in Brazil until the mid-1990s.

We excluded gubernatorial elections from the Distrito Federal from our sample due to its differences from the twenty-six states in Brazil. Unlike the states, the federal district has the authority of a state and municipal government. For example, the Distrito Federal collects both municipal and state taxes. Furthermore, the federal government has jurisdiction in the Distrito Federal for public policies which are the state's responsibility in the other states. This is the case of important areas, such as policing.

3. As our goal is to assess the electoral accountability of the incumbent, the sample excludes elections where the party seeking reelection is not the same political party that was elected to the governorship in the previous election. Forty-four elections were excluded. These can be classified into three categories. First, there were thirty-six cases where the incumbent governor's party was a member of a coalition in the reelection bid, but not its head. Second, there are six cases where another candidate replaced the governor and this candidate sought reelection as a member of a political party other than the governor's party. Finally, there are two cases where the incumbent governor abstained from supporting a successor including a successor from his own party. The entire sample of elections coded by its inclusion and each sub-category is provided in [Supplementary Appendix A3](#).
4. [Supplementary Appendix A4](#) presents the distribution of gubernatorial elections won by the major Brazilian political parties. This table confirms that a small number of parties win governorships. There are some states, such as Sao Paulo, where there has been no alternation in party control as the PSDB has won every election since 1994. Unfortunately, we are unable to examine industrial concentration separate from services due to the classification provided by IBGE. There are some states, such as Acre in the North, that are dark-shaded due to their economy being primarily dependent on a large service sector and no significant industrial output.
6. The motivation for employing standard errors clustered at the state level is motivated by our research design and sampling frame. We do not include fixed effects in our specifications as we include a lagged-dependent variable as an explanatory variable and the time dimension is small. If our view that the fixed effects parameter estimates are likely biased and they would not suggest anything about the robustness of our findings ([Nickell 1981](#)).
7. As electoral coalitions are not stable across time in Brazil, we decided against using the vote share of the parties in the coalition. Not only would the lagged vote share be difficult to calculate, but its meaning would be questionable.
8. Elections with a larger number of parties will have a lower vote share for the incumbent. However, the number of effective political parties in a given election in a given state was not included as a control due to multicollinearity.
9. [Supplementary Appendix A6](#) presents the results of the same specifications using the unemployment rate in the election and year prior to the election. These alternative measures are not statistically significant and add further support to our theory that voters respond to changes measured in relative temporal and spatial terms.
10. The program was set to perform 1,000 simulations of each model reported in table 2. The probabilities reported in this paragraph and in the remaining references to *Clarify* results refer to the average effect.

References

Alt, James E., and Robert C. Lowry. 2010. Transparency and accountability: Empirical results for US states. *Journal of Theoretical Politics* 22 (4): 379–406.

Anderson, Cameron D. 2006. Economic voting and multilevel governance: A comparative individual-level analysis. *American Journal of Political Science* 50 (2): 449–463.

- . 2008. Economic voting, multilevel governance and information in Canada. *Canadian Journal of Political Science* 41 (2): 329–354.
- Arceaux, Kevin. 2006. The federal face of voting: Are elected officials held accountable for the functions relevant to their office?. *Political Psychology* 27 (5): 731–754.
- Arreche, Marta. 2004. Federalismo e políticas sociais no Brasil: Problemas de coordenação e autonomia. *São Paulo em Perspectiva* 18: 17–26.
- . 2005. Quem taxa e quem gasta: A barganha federativa na federação brasileira. *Revista de Sociologia e Política* 24 (24): 69–85.
- Arvate, Paulo Roberto, George Aveilino, and José Tavares. 2009. Fiscal conservatism in a new democracy: “Sophisticated” versus “naïve” voters. *Economics Letters* 102 (2): 125–127.
- Atkeson, Lonna Rae, and Randall W Partin. 1995. Economic and referendum voting: A comparison of gubernatorial and senatorial elections. *American Political Science Review* 89 (01): 99–107.
- Atkeson, Lonna Rae, and Randall W. Partin. 2001. Candidate Advertisements, Media Coverage, and Citizen Attitudes: The Agendas and Roles of Senators and Governors in a Federal System. *Political Research Quarterly* 54 (4): 795–813.
- Baer, Werner. 2008. *The Brazilian economy: Growth and development*. 6th ed. Boulder, CO: Lynne Rienner Publishers.
- Barberia, Lorena, and George Aveilino. 2015. Fiscal Discretion and Elections in the Brazilian States. In *Annual meeting of the Midwest Political Science Association 73rd Annual National Conference, April 16 - 19, 2015*. Chicago, Illinois: MPSA.
- Barberia, Lorena G., and Cirro Biderman. 2010. Local economic development: Theory, evidence, and implications for policy in Brazil. *Geoforum* 41 (6): 951–962.
- Barone, Leonardo Sangali, and George Aveilino. 2013. Electoral Accountability and Governors' Election in Brazil, 1990-2006, Paper prepared for the 71st Annual Midwest Political Science Association Conference. Chicago, Illinois.
- Besley, Timothy, and Anne Case. 1995. Does electoral accountability affect economic policy choices? Evidence from gubernatorial term limits. *The Quarterly Journal of Economics* 110 (3): 769–798.
- Brambor, Thomas, William Roberts Clark, and Matt Golder. 2006. Understanding interaction models: Improving empirical analyses. *Political Analysis* 14 (1): 63–82.
- Chubb, John E. 1988. Institutions, the economy, and the dynamics of state elections. *American Political Science Review* 82 (01): 133–154.
- Cohn, Samuel. 2012. *Employment and development under globalization: State and economy in Brazil, State and economy in Brazil*. Houndmills, Basingstoke, Hampshire and New York, NY: Palgrave Macmillan.
- Confederação Nacional de Indústrias (CNI). 2011. *Retratos da Sociedade Brasileira* (11)-Qualidade dos Serviços Públicos e Tributação. Brasília D.F.: CNI.
- de Oliveira, Alberto. 2006. *Território e mercado de trabalho: Discursos e teorias*. São Paulo: UNESP.

———. 2013. Os grandes projetos urbanos como estratégia de crescimento econômico. *EURS* 39 (117): 147–163.

———. 2017. A influência do território no comportamento do mercado de trabalho: Notas sobre a experiência brasileira. *EURS, Revista Latinoamericana de Estudios Urbanos Regionales* 43 (128): 81–98.

Ebeid, Michael, and Jonathan Rodden. 2006. Economic geography and economic voting: Evidence from the US states. *British Journal of Political Science* 36 (03): 527–547.

Fortunato, David, Clint S. Swift, and Laron K. Williams. 2016. All economics is local: Spatial aggregations of economic information. *Political Science Research and Methods*: 6: 1–21

Franzese, Robert J., and Cindy D. Kam. 2007. *Modeling and interpreting interactive hypotheses in regression analysis*. Ann Arbor: University of Michigan.

Gélinau, François, and Karen Remmer. 2006. Political decentralization and electoral accountability: The Argentine experience, 1983–2001. *British Journal of Political Science* 36 (1): 133–157.

Junqueira, Murilo de Oliveira 2010. *O nó tributário: Por que não se aprova uma reforma tributária no Brasil*. Sao Paulo: Department of Political Science, University of Sao Paulo.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. Making the most of statistical analyses: Improving interpretation and presentation. *American Journal of Political Science* 44 (2): 347–347.

Lewis-Beck, Michael S., and Mary Stegmaier. 2000. Economic determinants of electoral outcomes. *Annual Review of Political Science* 3 (1): 183–219.

Lewis-Beck, Michael, and Mary Stegmaier. 2013. The VP-function revisited: A survey of the literature on vote and popularity functions after over 40 years. *Public Choice* 157 (3–4): 367–385.

Limongi, Fernando, and Rafael Cortez. 2010. As eleições de 2010 e o quadro partidário. *Novos Estudos - CEBRAP* 88: 21–37.

Love, Joseph LeRoy, and Werner Baer. 2009. *Brazil under Lula: Economy, politics, and society under the worker-president*. 1st ed. New York: Palgrave Macmillan.

Marconi, Nelson. 1997. Uma breve comparação entre os mercados de trabalho do setor público e privado. *Revista do Serviço Público* 48 (1): 126–146.

Montoni, Gabriela Miranda, João S. Moura Neto, Nelson Marconi, and Paulo Roberto Arvate. 2009. Diferentes padrões de políticas salariais nos estados brasileiros: uma análise a partir do diferencial de salários público-privado. *Revista de Economia Política* 29 (3): 114–134.

Nickell, Stephen. 1981. Biases in dynamic models with fixed effects. *Econometrica* 49 (6): 1417–1426.

Orth, Deborah A. 2001. Accountability in a federal system: The governor, the president, and economic expectations. *State Politics & Policy Quarterly* 1 (4): 412–432.

Paldman, Martin. 1991. How robust is the vote function? A study of seventeen nations over four decades. In *Economics and politics: The calculus of support*, ed. Helmut Norpoth,

- Michael S. Lewis-Beck and Jean-Dominique Lafay, 9–31. Ann Arbor: University of Michigan Press.
- Peltzman, Sam. 1987. Economic conditions and gubernatorial elections. *The American Economic Review* 77 (2): 293–297.
- Powell, G. Bingham, and Guy D. Whitten. 1993. A cross-national analysis of economic voting: Taking account of the political context. *American Journal of Political Science* 37 (2): 391–414.
- Ragusa, Jordan M., and Matthew Tarpey. 2016. The geographies of economic voting in presidential and congressional elections. *Political Science Quarterly* 131 (1): 101–132.
- Remmer, Karen L., and François Gélinau. 2003. Subnational electoral choice economic and referendum voting in Argentina, 1983–1999. *Comparative Political Studies* 36 (7): 801–821.
- Resende, Guilherme Mendes, Bruno de Oliveira Cruz, Aristides Monteiro Neto, César Nunes de Castro, Ana Maria Bonomi Baruffi, Margarida Hatem Pinto Coelho, and Carlos Wagner de Albuquerque Oliveira. 2015. *Fatos Recentes do Desenvolvimento Regional no Brasil, Texto para Discussão 2054*. Brasília, D.F.: IPEA.
- Rezende, Fernando. 2007. Federal Republic of Brazil. In *The Practice of Fiscal Federalism: Comparative Perspectives*, ed. Anwar Shah, 73–98. Montreal: McGill-Queens University Press.
- Rodden, J., and E. Wibbels. 2011. Dual accountability and the nationalization of party competition: Evidence from four federations. *Party Politics* 17 (5): 629–653.
- Rodden, Jonathan. 2004. Comparative federalism and decentralization: On meaning and measurement. *Comparative Politics* 36 (4): 481–498.
- Samuels, David, and Fernando Luiz Abrucio. 2000. Federalism and democratic transitions: The “new” politics of the governors in Brazil. *Publics* 30 (2): 43–61.
- Schetim, Daniela, and Carlos R. Azzoni. 2013. Diferenciais regionais de competitividade industrial do Brasil no século 21. *Economia* 14: 361–387.
- Shankar, Raja, and Anwar Shah. 2003. Bridging the economic divide within countries: A scorecard on the performance of regional policies in reducing regional income disparities. *World Development* 31 (8): 1421–1441.
- Silva, Joana, Rita Almeida, and Victoria Stokova. 2015. *Sustaining employment and wage gains in Brazil: A skills and jobs agenda*. Washington DC: International Bank for Reconstruction and Development/The World Bank.
- Stein, Robert M. 1990. Economic voting for governor and US senator: The electoral consequences of federalism. *The Journal of Politics* 52 (01): 29–53.
- Ter-Minassian, Teresa. 2012. *Reform Priorities for Subnational Revenues in Brazil*. IDB Working Paper 157. Washington, DC: IDB.