Do Bigger Legislatures Lead to Bigger Government? Evidence from a Brazilian Municipal Council Reform

RODRIGO SCHNEIDER [iD]

HENRIQUE VERAS [iD]

*Author affiliations can be found in the back matter of this article

ABSTRACT

Do bigger legislatures lead to bigger government? We exploit a Brazilian reform that allocated the number of municipal council seats based on population thresholds in a regression discontinuity design. We find that larger councils have significantly higher public expenditures on social goods and legislative costs. Increased spending is partly financed by significantly higher local tax revenues and is driven by a less salient form of tax to voters – on services – than property taxes. As a potential explanation for our findings, we show that, more council seats led to greater political diversity.

A central feature of most modern democracies is the role that representation – where voters choose leaders to craft and enact policy – plays in fiscal and social planning. The effectiveness of governments worldwide in performing the financial functions of state is uneven across countries (Besley and Persson 2014). One potential driver of these observed differences is the size of legislatures (Miller and Moe 1983); however, the effect of legislature size on the size and efficacy of government is not entirely clear. On the one hand, larger legislatures may create a weak "local Leviathan" – an overextended and poor bureaucratic system – with little checks on its growth and inefficient use of the available resources. Similarly, more representatives could lead to greater opportunities for gridlock and the ability to veto legislation. On the other hand, a larger number of representatives might increase diversity in political participation and increase voter enfranchisement. This diversity may ensure that a plurality of views are effectively addressed, creating the necessary incentives and checks on elected representatives to deliver public goods and services to their electorate.

Despite the important welfare implications, the role of legislature size has not been extensively studied in developing countries. The vast majority of papers studying this question have focused on developed economies in Europe and North America (Egger and Koethenbuerger 2010; Frank and Stadelmann 2021; Höhmann 2017; Pettersson-Lidbom 2012), and have generally found that legislature size reduces spending, with any local tax changes being driven by property taxes (Freire et al. 2021). With its higher levels of informality, inequality, and ethnic diversity (Alesina, Baqir and Easterly 1999; Beach and Jones 2017; Luo et al. 2010; Miguel and Gugerty 2005), in addition to lower tax compliance and state capacity (Besley and Ghatak 2006; Naritomi 2019; Slemrod 2019), developing countries may have a considerably different relationship between legislature size and the efficacy of the government to tax and spend.[1]

This paper examines how legislature size affects the size of government and how it collects and spends revenues. We study a 2004 Brazilian reform that allocated the number of seats on a municipal council based on population thresholds; cities received an additional council seat for each 47,671 inhabitants. Employing a regression discontinuity (RD) design, we find that municipalities with an extra council seat have significantly higher expenditures. To partly fund these increased expenditures, municipalities with larger councils raised significantly more local tax revenue. Brazilian municipalities have two primary tax instruments at their disposal: on property (IPTU) and services (ISS). We find that service tax revenue increases with council size, and do not find evidence of a similar jump in property taxes. This result is in contrast to Egger and Koethenbuerger's (2010) finding of increased property taxation by Bavarian municipalities. Along the lines of Cabral and Hoxby (2012), we argue that the decision to increase revenue through service taxes as opposed to property taxes is driven by salience. In Brazil, property owners have their bill with the full year's tax burden mailed to them in early February. Service taxes, on the other hand, are fragmented and collected as a small fraction of transactions at point-of-sale, and thus are less obvious to citizens and easier to collect.[2]

Two anecdotes are revealing in demonstrating the resistance to property taxes in Brazil. In 2006, the city of Manaus attempted to update property tax values (which had not been updated since 1983), but faced a legal challenge and was struck down by Brazil's active court system.[3] On March 16th, 2015, the municipal council of Itapetininga in São Paulo unanimously vetoed a service tax on construction services. This event was unusual in the presence of media coverage and popular attendance; service taxes are not generally salient, and citizens became aware of the tax in this specific situation as it was being charged together with their property tax payments.[4]

---

1   An exception is the paper by Galindo-Silva (2021) that study a similar discontinuity in the number of council members in the context of Colombia. They find that having more members in the council is associated with less political violence as parties associated with armed groups are more likely to be represented in those places.

2   Additionally, politicians up for re-election have an increased incentive to levy a less transparent tax on voters (Bordignon, Grembi and Piazza 2017).

3   A modified version of this reform was eventually implemented in 2011. More information on the reform can be found in an article from one of the main Brazilian newspapers *O Globo (G1)*: link to article.

4   The online portal *O Globo (G1)* highlighted the event: link to article.

Lastly, we present evidence that sheds light on a potential mechanism to rationalize the increased spending and taxation by larger local councils. We reconcile our findings in support of the "Law of 1/n" proposed by Weingast, Shepsle and Johnsen (1981) that larger legislatures would lead to more government spending, as officials would have an incentive to increase spending to please their core supporters and spread these costs across the entire community. As Brazil uses a multi-member proportional representation system, we find that increasing the size of local councils increases political diversity, as political parties' concentration in the local chamber decreases and less educated candidates are more likely to be elected suggesting that more council seats indirectly enfranchises a larger share of the population, leading to politicians incentivized to provide more pro-social public goods (Chattopadhyay and Duflo 2004; Fujiwara 2015; Ting, Hirano and Snyder Jr. 2018).

Our focus on local councils is of primary importance to policymakers concerned with economic growth and development. The ability of governments to raise and spend tax revenue is central to the building of state capacity (Besley and Persson 2009; Gaspar, Jaramillo and Wingender 2016; Sánchez De La Sierra 2020). Increasingly, the role of spending and taxation is being decentralized to state and local governments; for example, tax revenue collection at the state and local level has increased in nearly 75 percent of OECD countries since 1995 (Shi and Tulli 2020).

Our paper contributes to the literature on the relevance of legislature size – an old theme of political thought. Empirical papers testing the prediction of Weingast, Shepsle and Johnsen (1981) have had decidedly mixed results, with some finding support for increased spending (Asatryan et al. 2017; Baqir 2002; Egger and Koethenbuerger 2010; Halse 2016), while others find a negative relationship between legislature size and expenditures (Chen and Malhotra 2007; Garmann 2014; Höhmann 2017; Pettersson-Lidbom 2012). Moreover, with the notable exception of Lewis's (2019) study in Indonesia, nearly all of the literature has focused on studies in the developed world: the United States, Germany, Scandinavia, and Japan. Given the disparity in state and fiscal capacity across levels of economic development, our paper provides a valuable test of Weingast, Shepsle and Johnsen (1981) in a developing country setting.

This paper also relates to the literature on the importance of tax salience in public finance. The effect of tax salience has been studied on consumer behavior (Blumkin, Ruffle and Ganun 2012; Bradley and Feldman 2020; Cabral and Hoxby 2012; Chetty, Looney and Kroft 2009; Goldin 2015), tax collection (Asatryan, Baskaran and Heinemann 2017; Finkelstein 2009; Slemrod 2019), and voting behavior (Bordignon, Grembi and Piazza 2017; Matějka and Tabellini 2016; Sances 2017; Sausgruber and Tyran 2005). In the case of Brazil, where property tax compliance is around 60 percent and property taxes are perceived as a political burden to municipal legislators (Ter-Minassian 2012), the salience of property taxes to voters greatly influences the government's propensity to rely on it to finance expenditures. Many developing countries have a similar experience to Brazil in regards to tax enforcement; many countries have compliance rates far lower than Brazil's (Weigel 2020). In contrast to the United States (Galletta and Ash 2019) and Germany (Egger and Koethenbuerger 2010), where property taxes play a larger role in local finances, the ability of local government in developing countries to increase revenue from an alternative and less salient tax source may make it the preferred option to fund the increased size of government.

The rest of the paper is organized as follows. Section I provides background on the composition and responsibilities of municipal councils in Brazil. Section II describes the data and discusses the empirical strategy. The main empirical findings are presented in section III, with placebo tests in section IV, and a potential mechanism discussed in section V. Section VI concludes.

I INSTITUTIONAL BACKGROUND

A MUNICIPAL PUBLIC FINANCES

The Brazilian political system is a federation with three levels: federal, state, and municipal. The approximately 5,500 local (municipal) governments are comprised of an elected mayor, municipal council, and municipal court.

Municipalities enjoy some degree of political autonomy, guaranteed by the constitution. Specifically, municipalities enact their own laws and, every fiscal year, the mayors produce a budget proposal detailing the public expenditure and investments for the subsequent year, based on the expected tax revenue. Municipal councilors are responsible for evaluating and voting on the mayor's proposal, as well as any other proposal put forward by themselves. Once the proposed budget is approved, it becomes the Budgetary Law (*Lei Orçamentária*) dictating the destination of the tax revenue collected at the municipal level.

Municipalities collect local tax revenue from two main sources: property and services. Property taxes are levied annually on ownership (IPTU) and over real estate transactions (ITBI).[5] While Brazilian Law 10,257/2001 limits the IPTU rate to be at most 15 percent, this value is much higher than the 1–1.5 percent rate that is usually charged across municipalities in Brazil.

Service taxes (ISS) are levied on every transaction that involves the exchange of services within the municipality boundaries. Municipal councilors have the autonomy to legislate the tax rate for any type of local service, as long as they respect the constitutional range of 2 to 5 percent.[6] The municipal councils, therefore, can use legislation to add or remove services to be taxed according to their interpretation of the services covered by this law, and also change the tax rate of the services that are already being taxed.

Municipal councils are active in updating and altering ISS tax schedules.[7] For example, on March 27, 2018, the municipal council of Boa Vista in Roraima approved an amendment to include six new services to the list of activities taxed via ISS. Conversely, on March 16, 2015, council members of Itapetininga in São Paulo voted to eliminate house improvements from the list of service taxes. More recently, the city of São Paulo approved a tax rate increase for banking services from 2 percent to 5 percent in March 2020.

B MUNICIPAL COUNCILS

Municipal councils are directly elected by the population for a four-year term. However, unlike the mayor – who is elected by a simple majority rule – municipal councils are elected based on an open list proportional representation system, in which parties' share of seats is proportional to the quantity of votes cast to their candidates. Municipal councils, on average, have a wage that is 2.6 times the average in their municipalities (Colonnelli, Prem and Teso 2020). Nonetheless, most of them have an outside job as they are only required to be in the council on average four days per month (Ferraz and Finan 2009). Their main duty is to approve local legislation, such as tax adjustments and the municipal budget. They are also involved in the submission of bills and request for public works and monitoring the executive for its use of public resources.

With the objective of reducing municipal expenditures on administration and personnel, the Brazilian Supreme Electoral Court in 2004 expedited a resolution assigning the number of seats to each municipality according to a strict rule based on population size. This ruling came into effect for the 2004 election cycle. Each municipality received a minimum of 9 council seats, adding one additional seat for each 47,619 inhabitants, up to 21 seats for municipalities with less than 1 million inhabitants.[8] Appendix table A1 provides a list of the population thresholds for municipalities with fewer than 500,000 residents.

Importantly for our empirical strategy, the court ruling occurred only seven months before the 2004 elections and used the 2003 population estimates from the IBGE to determine the population thresholds. Given the abrupt timing of the ruling and use of the previous year's population,

---

5   This paper focuses on IPTU, as ITBI accounts for less than 0.5 percent of overall taxation in Brazil (Afonso, Soares and Castro 2013) and its contribution to municipal revenue is almost negligible.

6   This limit was set by Complementary Law 116/2003.

7   Although we do not have a comprehensive database on the variation in ISS tax rates across municipalities, a list constructed by the private security union of the state of São Paulo (SESVESP) provides some insights. SESVESP collected the ISS rate for private security in each of São Paulo's 645 municipalities; this tax varies from 2 percent to 5 percent, with an average 3.66 percent (std. 1.18) across municipalities.

8   This increment was determined by the Court's ruling that a municipality with less than one million inhabitants should have at most 21 councilors: 1,000,000/21 = 47,619.

candidates faced an exogenous shock to electoral competition for seats and were unlikely to anticipate the new political reality. Moreover, municipalities were not able to endogenously react to the new ruling before the start of elections. Figure A.1 (A) shows the distribution of municipalities by population and council size for the 2005–2008 council term, with a sharp discontinuity at the policy thresholds.

II DATA AND EMPIRICAL METHODOLOGY

A DATA

Data on public finances comes from the *Secretaria do Tesouro Nacional* (STN). All finance variables are provided at the municipal level, and we restrict our attention to the 2005–2008 electoral cycle. Relevant data includes the destination of yearly public expenditures and source of municipal tax revenue. Appendix table A.2 provides summary statistics of our main outcome variables for the full sample, as well as for the municipalities in the optimal bandwidth as discussed in greater detail in the next subsection. We use tax revenue as the outcome variable, as no reliable data on individual tax rates for all Brazilian municipalities exist (Dahis and Szerman 2020).[9] Additionally, we define "social" spending by a municipality as the total annual expenditures on health, education, and housing programs.

Electoral data is provided by the *Tribunal Superior Eleitoral* (TSE). Outcomes of interest include the number of legislative council seats in a municipality, characteristics and party affiliation of council members, and electoral outcomes from the 2004 election cycle.

We also collect municipal-level characteristics from the *Instituto Brasileiro de Geografia e Estatistica* (IBGE). Population estimates for 2003 from the IBGE are used to verify the application of the municipal council reform, and to construct the running variable. Additionally, pre-treatment variables from the 2000 census are used to check the balance in municipal characteristics across the discontinuity, as discussed part 2.3 of this section.

We restrict our analysis (and variables of interest) to the 2005–2008 electoral term. Additionally, we focus on municipalities affected by the first and second population thresholds (47,619 and 95,238, respectively). The sample covers municipalities with populations under 120,000 residents, and municipal councils with 9, 10, or 11 seats. Figure 1(A) shows the distribution of council seats by municipal population for this sample, with a large number of observations on each side of the well-defined threshold. This restricted sample covers over 97 percent of municipalities in Brazil (see appendix figure A.1(B)) and more than half of the total population of the country. While focusing our analysis on smaller municipalities reduces the generalizability of our findings, we note that the larger council threshold do not have enough observations to support the empirical strategy. Moreover, the smaller sample has the added benefit of reducing concerns related to the heterogeneity in (un)observables across all Brazilian municipalities.

Panel A: Municipal Council Sizes, 2005-2008 **Panel B:** Manipulation Density Plot

Figure 1 Distribution of Council Size by Population.

Notes: This figure shows the distribution of council size according to population size across municipalities. Panel A depicts the actual number of municipal council seats allocated to each municipality according to population size on the 2005–2008 electoral cycle for the first two cutoffs. Panel B displays the manipulation density plot and reports the p-value for the density test based on Cattaneo, Jansson and Ma (2018) using a 95% confidence interval.

---
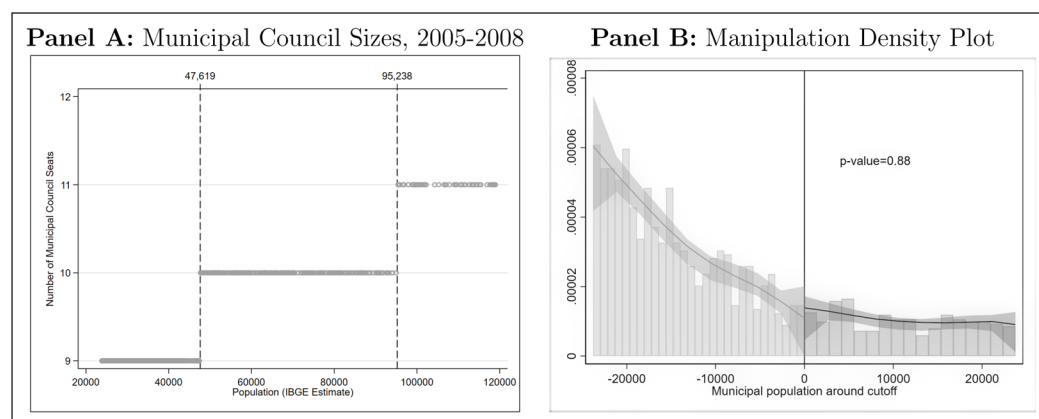
9   This is true for many other settings as well, including the United States (Galletta and Ash, 2019).

B IDENTIFICATION

This section outlines the regression discontinuity (RD) design utilizing the 2004 resolution that determined the number of municipal council seats based on strict population thresholds. This setting allows us to implement a sharp RD design to estimate the reduced-form (RF) effect of council size, with municipal population as the running variable. The underlying identifying assumption of this strategy is that municipalities with similar population levels around the cutoffs would have similar expenditures and tax revenues in the absence of the 2004 resolution. Our specification follows the basic RD form:

$$y_m = \alpha + \beta t_m + f(x_m) + \epsilon_m$$
$$\forall x_m \in (c - h, c + h)$$

(1)

where y_m is the outcome of interest, t_m is an indicator for whether municipality m is on the "high" side of the council size threshold ($t_m = \mathbb{I}[x_m \geq c]$), and the running variable x_m is the municipal population relative to the appropriate threshold. We pool the first two thresholds of the 2004 reform and normalize them to a cutoff c, which is equal to zero. The function $f(x_m)$ is a local linear function fit separately on each side of the cutoff.[10] We restrict attention to municipalities with the endogenously chosen mean squared error optimal bandwidths (h) to account for biases arising from the choice of large bandwidths (Calonico, Cattaneo and Titiunik 2014).

Following Calonico et al. (2019) we do not include a host of municipal-specific control variables, as including covariates is not well-justified in this setting. Since we run a stacked regression by pooling the first two population thresholds, we follow the standard practice of including a threshold fixed effect (Abdulkadiroğlu, Angrist and Pathak 2014). One potential issue associated with this pooling approach is if municipalities close to different population cutoffs differ in a range of characteristics (Bertanha 2020; Cattaneo et al. 2016; Eggers et al. 2018); however, we reduce the impact of this concern by restricting attention to the cutoffs associated with 9, 10, and 11 member council sizes.[11] Figure 1(A) displays the sharp discontinuity at the specified thresholds.

C PRELIMINARY CHECKS

There are three potential threats to the validity of our estimation strategy. First, our strategy relies on the assumption that the only difference between municipalities on either side of the cutoff should be the assignment to treatment (in our case, an additional seat in the municipal council). To address the plausibility of the assumption, we run our specification on a range of municipal-level socioeconomic indicators to test whether there are any differences in these characteristics across the treatment cutoff. These pre-treatment variables should not vary at the population threshold, and we present evidence of this balance in appendix table A.3. The table displays the results of these checks across several municipal characteristics, including public finance variables, electoral outcomes, and socioeconomic and demographic factors. We do not observe any statistically or economically significant differences on these characteristics across municipalities around the cutoff. The exceptions are a decrease in council seats (11% significance level) and voting turnout (6% significance level) using the quadratic model. As previously mentioned, the reform we study was created to reduce expenditures on administrative personal, which was disproportionately higher is smaller municipalities. Therefore, our results are consistent with the Brazilian context before the law that regulated the number of seats according to population size. Prior to that, smaller municipalities were more likely to have more council members, disproportionately increasing the weight of each voter (i.e., seats per voter) in the municipal council election, which can also explain the higher turnout in those smaller municipalities.

---

10   Our results are robust to using quadratic functions (results are available upon request). We restrict our attention to first and second degree polynomials as higher order polynomials might introduce bias to our estimation (Gelman and Imbens 2019).

11   See Britto and Fiorin (2020) for a more detailed discussion of restricting attention to the lower thresholds of the 2004 reform.

Second, if the population thresholds determining council size is also used to implement other policies, the estimated coefficient and its interpretation will be biased. While no other government policy uses these precise population thresholds, other aspects of public finances in Brazil are partly determined by similar population threshold rules. To address this, we run placebo tests using different population thresholds to check whether our results can be attributed to two other policies based on population thresholds: federal transfers and legislator salaries. Reassuringly, we do not find evidence of statistically significant effects for any of the placebo thresholds. A more detailed discussion of these placebo tests is provided in section IV.

The third threat to validity is the possibility of manipulative sorting by government officials on either side of the threshold. Our results might be biased if the likelihood to successfully manipulating official population numbers is correlated with (unobserved) municipal characteristics. This concern is mitigated due to the fact that the 2004 resolution was based on 2003 population estimates, which were already published prior to the decision of the Supreme Electoral Court to establish the population-based rule for council size. Nevertheless, we formally address this concern in Figure 1(B) by performing the density test outlined by Cattaneo Jansson and Ma (2018) to check for discontinuities in the population distribution, and find no manipulation around the cutoff.

III MAIN RESULTS: LOCAL SPENDING AND TAXES

A GOVERNMENT EXPENDITURES

We start this section by examining the effect of increased council size on municipal expenditures. The top two graphs of Figure 2 plots binned averages of legislative expenditures over the municipal population relative to the normalized reform threshold. Local linear fits on either side of the cutoff are included in the figure as well, together with the 95% confidence intervals. This figure shows no significant increase in legislative nor social expenditures due to the addition of an extra council member. In Figure 3, we split the sample into the two cutoffs that we analyze, that is, municipalities with 9 versus 10, and the ones with 10 versus 11 municipal councilors. The top two graphs of panels A and B show no significant changes in expenditures across the two cutoffs analyzed.
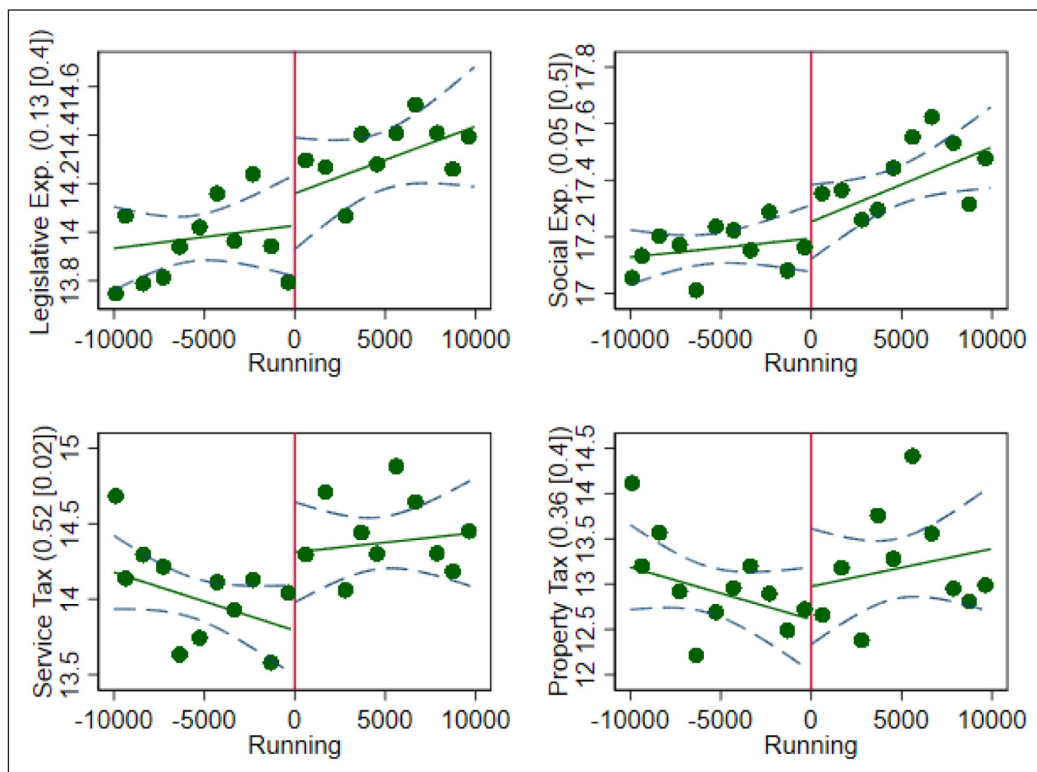

Figure 2 RD Treatment Effects on Government Expenditures and Tax Revenue.

Notes: This figure shows the relationship between municipal council size and total expenditures and tax revenue. Each dot represents sample average for municipalities within 1,000 people bins. Social expenditure (exp.) is defined as the sum of spending on education, health, and housing programs. RD estimates with p-values in bracket is showed in parenthesis for each variable in the vertical axis of the graphs. Running in the horizontal axis refers to the running variable (i.e., population around the cutoff).

Figure 3 RD Treatment Effects Across Cutoffs.

Notes: This figure shows the relationship between municipal council size and total expenditures and tax revenue. Each dot represents sample average for municipalities within 1,000 people bins. Social expenditure (exp.) is defined as the sum of spending on education, health, and housing programs. RD estimates with p-values in bracket is showed in parenthesis for each variable in the vertical axis of the graphs. Running in the horizontal axis refers to the running variable (i.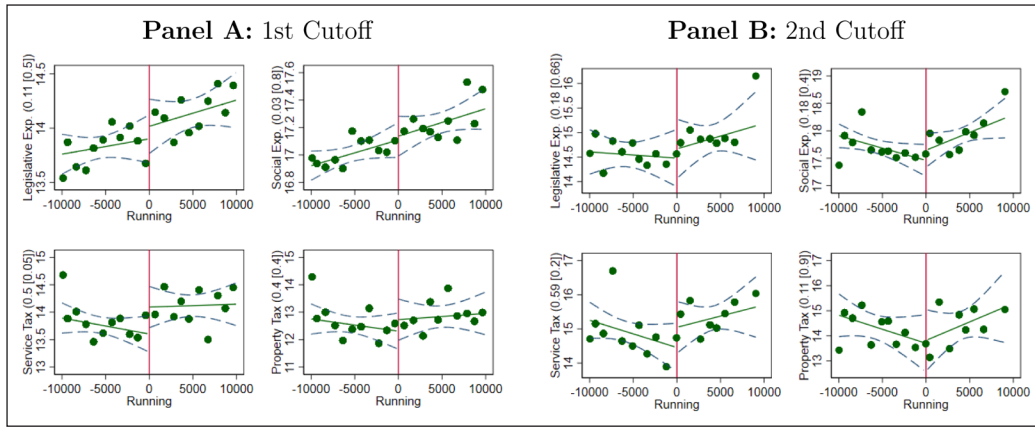e., population around the cutoff). This analysis splits the sample into two: Panel A shows estimates for the first cutoff (i.e., 9 vs. 10 municipal councilors) and Panel B shows estimates for the second cutoff (i.e., 10 vs. 11 municipal councilors).

In Table 1, Panel A, we present the corresponding estimates using the bias-corrected with robust p-values and optimal bandwidth developed by Calonico, Cattaneo and Titiunik (2014). Columns 1 and 2 present the estimated change in expenditures on legislative costs and social programs, respectively. We find an increase of 23% and 16%, respectively. Using the average expenditures (last row of the table), we find an increase of close to 6.3 million Brazilian reais. In columns 3 and 4, we examine whether this increase could be explained by an increase in deficit or reallocation of resources. The results, however, indicate an increase in both total expenditures and well as revenue suggesting that the increase in legislative and social spending we find is associated with higher taxation. We discuss this further in the following subsection. In Table 2, Panel A, we show that using the same municipalities but replacing the variables we analyze with the ones from the previous electoral cycle, that is, 2001–2004, had no significant changes.

	PANEL A: EXPENDITURES			
	LEGISLATIVE COSTS	SOCIAL PROGRAMS	TOTAL EXPENDITURES	TOTAL REVENUE
	(1)	(2)	(3)	(4)
Effect of Additional Council Seat	0.232*	0.163**	0.139*	0.144*
P-values	0.098	0.03	0.067	0.073
Bandwidth	10214	8360	10042	8215
Observations	1001	1078	1078	1078
Average (Brazilian reais in millions)	1.5	37.3	40.4	58.2
	PANEL B: TAXES			
	PROPERTY TAX	SERVICE TAX	STATE TRANSFERS	
	(1)	(2)	(3)	
Effect of Additional Council Seat	−0.175	0.529**	0.404	
P-values	0.79	0.029	0.135	
Bandwidth	8345	9787	7108	
Observations	1075	1078	1078	
Average (Brazilian reais in millions)	1.8	2.9	11.2	

Table 1 Local Government Spending and Taxation.

The point estimates are constructed using a local polynomial estimator with a triangular kernel. The top 5% and bottom 5% of each variable is winsorized. Social spending is defined as the sum of spending on education, health, and housing programs. Significantly different than zero at 99 (***), 95 (**), 90 (*) percent confidence. Local-linear regression-discontinuity point estimates are bias-corrected with robust, p-values reported below each point. Only observations whose absolute normalized running variable is less or equal to *h* are used. MSE-optimal bandwidth *h* developed by Calonico, Cattaneo and Titiunik (2014).

PANEL A: EXPENDITURES			
LEGISLATIVE COSTS	**SOCIAL PROGRAMS**	**TOTAL EXPENDITURES**	**TOTAL REVENUE**
(1)	**(2)**	**(3)**	**(4)**
Effect of Additional Council Seat			
0.062	0.094	0.121	0.125
P-values			
0.606	0.249	0.136	0.133
Bandwidth			
9450	10243	10455	8479
Observations			
1048	1082	1082	1082

PANEL B: TAXES		
PROPERTY TAX	**SERVICE TAX**	**STATE TRANSFERS**
(1)	**(2)**	**(3)**
Effect of Additional Council Seat		
–0.554	0.349	0.316
P-values		
0.407	0.157	0.262
Bandwidth		
7233	11111	7645
Observations		
1075	1082	1082

Table 2 Local Government Spending and Taxation – Previous electoral cycle.

The point estimates are constructed using a local polynomial estimator with a triangular kernel. The top 5% and bottom 5% of each variable is winsorized. Social spending is defined as the sum of spending on education, health, and housing programs. Significantly different than zero at 99 (***), 95 (**), 90 (*) percent confidence. Local-linear regression-discontinuity point estimates are bias-corrected with robust, p-values reported below each point. Only observations whose absolute normalized running variable is less or equal to *h* are used. Results shown using the MSE-optimal bandwidth *h* developed by Calonico, Cattaneo and Titiunik (2014).

These findings complement those of Cepaluni, Freire and Mignozzetti (2020), which find significant gains in health and education as a result of this policy; larger council sizes lead to significant decreases in infant mortality and increases in kindergarten enrollment. These welfare gains are partly driven by an increase in government resources devoted to these sectors, and not solely from efficiency gains using existing resources. Moreover, spending on visible health and urban infrastructure may benefit re-election chances, as spending on these types of building projects are highly salient to voters (Brollo and Nannicini 2012). Nonetheless, our results should be interpreted with care as the analysis regarding increase in government spending is not robust across the different models we discussed in this subsection.

B TAX REVENUES

We next examine how larger municipal councils funded these increases in government expenditure. The bottom two graphs of Figure 2 display the RD plots for service taxes (ISS) and property taxes (IPTU), respectively. As seen in the figure, the effect is driven by a significant increase in service tax revenue, whereas property taxes do not seem to be significantly different across municipalities around the population cutoff. In Figure 3, the bottom two graphs of panels A and B show no significant changes in property taxes and an increase close to 50% in service taxes across cutoffs. The second cutoff in Panel B, however, is less precisely estimated.

Overall, the increase in service taxes is the most robust result we found in our analysis and in figures A.3 and A.4 we present further corroboration of its strength. Different from the other variables we analyze (results available upon request), the change in service tax is robust across bandwidths choices. As figure A.3 shows, when testing for different bandwidths (using intervals of 1,000 units) we find consistent results using bandwidths between 5,000 and 15,000, being specially strong around 10,000 (the optimal bandwidth is 9,787). Moreover, as figure A.4 shows, our results are robust to estimating 10,000 regressions where we randomly select a fake cutoff and find that only 0.4% of the regressions gives us an estimate that is larger than the one we find using the correct cutoff.

Table 1, Panel B, present the corresponding estimates using the bias-corrected with robust p-values and optimal bandwidth developed by Calonico, Cattaneo and Titiunik (2014). Column (2) shows a statistically significant increase in service tax revenue for municipalities with an additional council

seat. The results show an increase of 53% in service tax, which is consistent with the estimations we found in Figures 2 and 3. This is contrasted with the estimated effect on property tax in column (1), which shows no significant impact on IPTU revenue in municipalities with larger legislatures. In Table 2, Panel B, we show that using the same municipalities but replacing the variables we analyze with the ones from the previous electoral cycle, 2001–2004, had no significant changes.

It is important to note that although a 50 percent increase in tax revenue might seem implausibly large, the share of tax revenue collected directly by municipalities is fairly low in Brazil. The average share of service tax to total revenue from all sources – including state and federal transfers – is approximately 4.1 percent, whereas the average share of property tax is around 2.65 percent in our sample. Thus the estimated increase in service tax revenue represents an approximately 2 percent increase in total municipal revenue on average.[12]

Using the average service tax revenue in the sample we analyze (last row of Table 1, Panel B), we find that a 53% increase in this variable would generate an extra revenue of close to 1.5 million Brazilian reais. This number could only explain about a quarter of the total increase in legislative and social spending. We also examine, in column 3 of Panel B, the local revenue that comes from state transfers and found a potential explanation for the increase we observe. Even though our findings are less precisely estimated, a 40% increase in this variable would correspond to a 4.5 extra million Brazilian reais that would be enough to cover the remaining of the increase in expenditures that we found. This increase in state transfers could be explained by the fact that part of its allocation is discretionary and, as local politicians are vote brokers for state government politicians (Novaes 2018), an extra seat in the local council increases the relative attractiveness of the municipality as more vote brokers are available in that location. Nonetheless, as our results involving public spending is not robust across different model specifications, we urge readers to interpret them with care.

Our finding that an additional seat at the municipal council increases service tax revenue and not property taxes seems at odds with the Ramsey rule in regards to taxing more inelastic goods. Our results are also in contrast with Egger and Koethenbuerger's (2010) finding that increases in local spending in Bavaria are driven primarily by property taxes. Property taxes are economically more efficient to raise revenue than other types of taxes, given properties' immovable nature and, consequently, the difficulty of evasion. However, property taxes are relatively more salient than indirect taxes, such as services taxes (Slack and Bird 2014).[13] Moreover, property taxes are deeply unpopular with voters (Ahmad, Brosio and Pöschl 2015; Cabral and Hoxby 2012; Sances 2017), and delinquency in property tax payments in developing countries is fairly common (Okunogbe and Pouliquen 2018; Weigel 2020). We therefore interpret our results as an indication that, given the relatively higher political burden of an increase in property tax, legislators in high-delinquency, low state-capacity environments have an incentive to raise tax revenue through the less transparent services tax.[14]

IV PLACEBO TESTS: TRANSFER AND SALARY THRESHOLDS

As mentioned in the validity checks in section II, we provide additional evidence from placebo tests that the main result is being driven by the increase in municipal council size, and is not due to other government policies. As our paper relies on a regression discontinuity framework to provide quasi-experimental variation in legislative size, the causal interpretation of our estimated treatment effect would be biased if the population thresholds determining council size were

---

12   Appendix Figure A.2 shows the fraction of total municipal tax revenue derived from property taxes (IPTU) and displays considerable spread, with nearly municipalities generating less than 25 percent of tax revenue from property assessments.

13   In Brazil, property tax payments are usually billed by the local authorities in the month of February to the property owner's address, as opposed to the indirect services tax, which are not explicitly displayed in the prices paid by the final consumer.

14   Bracco, Porcelli and Redoano (2019) finds a similar result for a relatively higher tax burden on less salient taxes in Italian municipalities when electoral competition is higher.

also used for the implementation of other policies. While, to the best of our knowledge, no other government policies employ the same population thresholds, there exist two other policies based on population cut-offs that could plausibly drive the results on local public finance. The policies are related to federal transfers and legislator salaries, and we analyze them in turn below.

Federal transfers to municipalities (*Fundo de Participação dos Municípios – FPM*) are partly determined by a formula based on population thresholds, as documented in Corbi, Papaioannou and Surico (2019), Litschig and Morrison (2013), and Rocha (2019). While FPM policy is based on a discontinuous function employing different population thresholds than the municipal council ruling, FPM transfers are a significant source of federal support for municipalities and could have a dominant effect on local public finance decisions. One concern is that municipalities just below an FPM threshold could be more strained in their financial resources, for which municipalities might compensate by taxing more and spending less.

Panel A of Table 3 displays estimated effects of an RD specification employing the FPM threshold instead of the municipal councils thresholds used in equation B. That is, coefficients in Panel A are the estimated RD effect for municipalities on the "high" side of the threshold that receive more federal transfers than those similarly sized municipalities on the "low" side of the discontinuity. As in equation B, we aggregate municipalities and normalize the cut-off to the nearest population threshold, and restrict the sample to those municipalities present in the main specification. We do not find any robust evidence that the FPM threshold is driving the difference in either expenditure or tax revenues across municipalities with different legislature sizes.

	PANEL A: FEDERAL TRANSFERS THRESHOLD			
	LEGISLATIVE COSTS	SOCIAL PROGRAMS	PROPERTY TAX	SERVICE TAX
	(1)	(2)	(3)	(4)
Effect of Additional Council Seat	0.017	–0.008	0.571	–0.141
P-values	0.948	0.971	0.369	0.801
Bandwidth	2,373	1,942	1,690	2,088
Observations	987	1,064	1,061	1,064
	PANEL B: LEGISLATOR SALARY THRESHOLD			
	LEGISLATIVE COSTS	SOCIAL PROGRAMS	PROPERTY TAX	SERVICE TAX
	(1)	(2)	(3)	(4)
Effect of Additional Council Seat	–0.085	–0.093	–0.187	–0.148
P-values	0.651	0.453	0.815	0.682
Bandwidth	5,825	5,431	5,980	7,368
Observations	725	776	775	776

Table 3 Placebo Tests Using Alternative Policy Cutoffs.

The point estimates are constructed using a local polynomial estimator with a triangular kernel. Social spending is defined as the sum of spending on education, health, and housing programs. Significantly different than zero at 99 (***), 95 (**), 90 (*) percent confidence. Local-linear regression-discontinuity point estimates are bias-corrected with robust, p-values reported below each point. Only observations whose absolute normalized running variable is less or equal to *h* are used. Results shown using the MSE-optimal bandwidth *h* developed by Calonico, Cattaneo and Titiunik (2014).

An additional policy that may be relevant for local public finances is legislator salaries. As with FPM transfers, the maximum allowable wages for local legislators in Brazil are set by a formula partially based on municipal population thresholds (see Cunha and Manoel (2019) and Ferraz and Finan (2009)). The population thresholds employed in this salary policy are different than the ones employed in this paper, but the policy could nevertheless potentially drive our main results. Legislators' ability to increase their salaries above thresholds on the salary cap could necessitate greater tax revenues to cover these increased expenses.

We explore the role of legislator salaries on local finances in panel B of Table 3. The panel presents estimated coefficient from an RD specification using the thresholds related to legislator salary caps. As in Panel A, we find no evidence that legislator salaries have a significant impact on either expenditure or tax revenue. The estimates are likewise imprecisely estimated and not statistically different from zero.

The lack of significance in either panel provides additional support to the fact that the differences in public finances observed in the main results are driven by differences in legislature size and not in coincident government policies that employ population thresholds across municipalities.

V POTENTIAL MECHANISM: ELECTORAL DIVERSITY

In this section, we shed light on a potential mechanism to rationalize the increase in government spending and taxation across the RD threshold. We provide evidence that an increase in the number of council seats up for election increases the political diversity of parties represented in the local legislature. Consistent with the literature on public expenditure and political diversity, more politically diverse councils spend more on providing "pro-social" goods, such as education and housing, necessitating the need for greater tax revenue.

Our mechanism is driven by two key insights from the political economy literature. The first comes from the theoretical framework of the "law of $1/n$" proposed by Weingast, Shepsle and Johnsen (1981), which shows a positive relationship between the number of elected officials and public spending financed via taxation. The mechanism underlining this relationship is straightforward: public expenditures are financed via taxation, and voters reward politicians representing their district if their individual benefits are larger than their costs. Since voters have concentrated benefits from public goods but their costs are diffused among all voters, it is more likely that the perceived benefits of publicly-financed projects will surpass their costs. Therefore, politicians are incentivized to increase the size of the government to benefit their district.

Empirical evidence supporting this theory is mixed. Cepaluni, Freire and Mignozzetti (2020) find evidence of welfare increases from larger Brazilian councils – consistent with the theory and most likely an outcome of the increase in government expenditures on public goods shown in section III. However, papers studying developed country setting, such as Pettersson-Lidbom's (2012) paper on a similar reform in Sweden and Finland, find that local government size is negatively related to government expenditure (Freire et al. 2021).

We reconcile these findings and support the predictions of Weingast, Shepsle and Johnsen (1981) in the Brazilian context using the insight of Duverger's Law. Duverger (1954) proposes that a multi-member proportional representation system, such as used in Brazilian local elections, favor multipartyism. This is in contrast to single seat elections, which favors two-party competition.[15] Therefore, in Brazilian local elections where more seats are open for competition, one would expect this increase to produce a wider array of potential candidates, and engender an increase in political diversity on larger councils.

To test Duverger's Law, we follow the empirical approach developed by Laakso and Taagepera (1979) in measuring political diversity. We define the effective number of parties in a given municipal council to be the inverse of the sum of the square of each party's proportion of all votes. Our measurement is the equivalent of the inverse of the Herfindahl–Hirschman index, which calculates firm concentration. Thus, in our analysis, the larger the effective number of parties, the smaller the concentration of political parties in the local council. Formally, for municipality m with $i = 1 \dots N_m$ political parties that received votes in the local election, we calculate the effective number of parties as:

$$ENP_m = \frac{1}{\sum_{i=1}^{N_m} p_i^2} \tag{2}$$

---

[15]   This can be explained by the psychological effects this voting system has on voters; when voters realize the minor party they like most has no chance of winning, they strategically vote for the party that they least "dislike" within the top two options (Benoit 2006; Fujiwara 2011).

where p_i is the proportion of votes received by each party i in municipality m.

Table 4, panel A, presents in its first column the results of the RD specification outlined in equation (2), with the effective number of parties as the dependent variable. We find that an additional municipal council seat translates on average to more than one effective party. We also test if this translates into an additional political party gaining a seat and find, in column 2, an increase of close to one political party. Nonetheless, the results are less precisely estimated. Using the work of Power and Rodrigues-Silveira (2019), we classified each party according to their political ideology after the local elections of 2004, which ranges between –1 (extreme left-wing) and 1 (extreme right-wing). We then created the average of this measure for each municipality according to the party of each councilor candidate elected. Finally, we tested whether there was a change in political ideology (column 3) across our cutoff and found not significant change. Also, the number of candidates running did not increase, which is consistent with the low entry barriers associated with elections in Brazil (Mainwaring 1998).

	PANEL A: POLITICAL PARTIES			
	EFFECTIVE NUMBER OF PARTIES	NUMBER ELECTED	RIGHT-WING IDEOLOGY	NUMBER CANDIDATES
	(1)	(2)	(3)	(4)
Effect of Additional Council Seat	1.54*	1.174	0.056	–10.429
P-values	0.06	0.237	0.255	0.54
Bandwidth	5858	8815	10655	10973
Observations	1082	1083	961	1083
	PANEL B: SHARE OF ELECTED COUNCILORS WHO …			
	…WERE BORN IN THE MUNICIPALITY	…ARE FEMALE	…ARE MARRIED	…ATTENDED HIGHER-EDUCATION
	(1)	(2)	(3)	(4)
Effect of Additional Council Seat	–0.057	0.057	0.083	–0.17**
P-values	0.573	0.181	0.121	0.034
Bandwidth	9465	7158	6240	6554
Observations	961	961	961	961

Table 4 Diversity on Municipal Councils.

The point estimates are constructed using a local polynomial estimator with a triangular kernel. Significantly different than zero at 99 (***), 95 (**), 90 (*) percent confidence. Local-linear regression-discontinuity point estimates are bias-corrected with robust, p-values reported below each point. Only observations whose absolute normalized running variable is less or equal to *h* are used. Results shown using the MSE-optimal bandwidth *h* developed by Calonico, Cattaneo and Titiunik (2014).

In Table 4, panel B, we more directly assess whether the relaxation of electoral competition driven by an additional council seat affected the diversity of the members elected to council. As the work of Klašnja and Titiunik (2017) discusses, political parties in Brazil are weak and politicians are only weakly attached to them making the vote process in Brazil more personalistic. Thus, an increase in the number of political parties being represented in the local chamber may not necessarily be interpreted as an increase in diversity. In an attempt to address this issue, we use demographic data on candidates elected to the municipal councils in 2004. The results show that larger councils had a higher share of members that did not attend higher-education, which can be seen as a proxy for income suggesting that lower income candidates were more likely to be elected. Combined, our findings indicate the possibility that adding a seat to the local council may have increased the number of politicians representing voters that were not *de facto* enfranchised, which creates an incentive to increase expenditures that will benefit them, raising tax revenue in the process.

Our finding that political diversity increases with council size corroborates evidence from the laboratory setting (Hix, Hortala-Vallve and Riambau-Armet 2017) and in Colombia (Galindo-Silva 2021) and Indonesia (Lewis 2018).[16] Moreover, we argue that this increase in diversity can explain the divergence from Pettersson-Lidbom (2012). In that paper the author finds suggestive evidence that in the case of Sweden and Finland, larger councils elected legislators that had a personal interest in lower taxes (e.g., business owners). The increase in political diversity of Brazilian councils is in line with higher expenditures: a candidate without countervailing interests (perhaps unlike the less diverse candidates in the Swedish and Finnish case) has an incentive to spend more money targeted at her group of supporters while costs are diffused across the city.

Our results are also consistent with other work in Brazil focusing on increasing voter enfranchisement. Fujiwara (2015) and Schneider, Athias and Bugarin (2019) find that an increase in electronic voting technology in Brazil led to greater *de facto* enfranchisement of poorer citizens, leading to an increase in spending on social goods. Similarly, Gouvea and Girardi (2021) find that more left-leaning mayors – who benefited from voter enfranchisement – increased social spending, particularly in the 2004–2008 term. Although the reform analyzed in this paper does not directly enfranchise voters in the same way as electronic voting, increasing the number of seats in local councils allows voters to be indirectly enfranchised, since their preferences have a larger likelihood of being represented as more parties can effectively participate in elections, increasing the range of ideological options.

VI CONCLUSION

This paper studies the role of legislature size on the size and functioning of government in a developing country setting. Relying on discontinuous changes in the number of seats allocated to municipal councils in Brazil, we find that one additional seat leads to increases in public spending. This increase is partly financed by more municipal tax revenue, and is driven by service taxes, as opposed to property taxes that are deeply unpopular with voters.

Our findings are consistent with the "Law of $1/n$" proposed by Weingast, Shepsle and Johnsen (1981), which has mixed support from the empirical literature. The results of this paper also stand in contrast to most studies focusing on Europe and the United States that find a negative effect of legislature size on spending. We believe that aspects of a developing country setting (lower state capacity, higher diversity, lower tax compliance) can reconcile the divergent findings of our study relative to similar reforms in developed countries.

Our paper sheds light on the importance of institutional context in understanding the intrinsic relationship between representation and local state capacity, both in terms of political party structure, as well as the tools of taxing and spending that legislatures have at their disposal. Public policies aiming to improve these dimensions of local public finance might benefit from political reforms targeting greater political diversity and voters' enfranchisement.

ADDITIONAL FILE

The additional file for this article can be found as follows:

- **Online Appendix.** In the appendix, we provide comprehensible information on population density, size of municipal council, reliance on local taxes and a summary of public finance related variables. We also provide additional analysis that reinforces the robustness of our presented results. DOI: https://doi.org/10.31389/eco.417.s1

---

16   In a related article, Lewis (2019) finds that larger local legislatures in Indonesia do not have a significant impact on expenditures. This is due primarily to the Indonesian context, where local governments are more fiscally constrained and councils have a more adversarial relationship with the mayor.

ACKNOWLEDGEMENTS

COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR AFFILIATIONS

Rodrigo Schneider   orcid.org/0000-0001-5324-2781
Skidmore College, US
Henrique Veras   orcid.org/0000-0001-9597-9335
Assistant Professor of Economics at Federal University of Pernambuco, Brazil; Centre College, US

REFERENCES

Abdulkadiroğlu, Atila, Joshua Angrist, and **Parag Pathak.** 2014. "The Elite Illusion: Achievement Effects at Boston and New York Exam Schools." *Econometrica* 82(1): 137–196. DOI: https://doi.org/10.3982/ECTA10266

Afonso, José, Julia Soares, and **Kleber Castro.** 2013. "Evaluation of the Structure and Performance of the Brazilian Tax System: White Paper on Taxation in Brazil." *Inter-American Development Bank Discussion Paper,* 265.

Ahmad, Ehtisham, Giorgio Brosio, and **Caroline Pöschl.** 2015. "Local Property Taxation and Benefits in Developing Countries: Overcoming Political Resistance?" In *Handbook of Multilevel Finance.* Edward Elgar Publishing. DOI: https://doi.org/10.4337/9780857932297.00022

Alesina, Alberto, Reza Baqir, and **William Easterly.** 1999. "Public Goods and Ethnic Divisions." *The Quarterly Journal of Economics* 114(4): 1243–1284. DOI: https://doi.org/10.1162/003355399556269

Asatryan, Zareh, Thushyanthan Baskaran, and **Friedrich Heinemann.** 2017. "The Effect of Direct Democracy on the Level and Structure of Local Taxes." *Regional Science and Urban Economics* 65: 38–55. DOI: https://doi.org/10.1016/j.regsciurbeco.2017.04.006

Asatryan, Zareh, Thushyanthan Baskaran, Theocharis Grigoriadis, and **Friedrich Heinemann.** 2017. "Direct Democracy and Local Public Finances under Cooperative Federalism." *The Scandinavian Journal of Economics* 119(3): 801–820. DOI: https://doi.org/10.1111/sjoe.12169

Baqir, Reza. 2002. "Districting and Government Overspending." *Journal of Political Economy* 110(6): 1318–1354. DOI: https://doi.org/10.1086/342804

Beach, Brian, and **Daniel B. Jones.** 2017. "Gridlock: Ethnic Diversity in Government and the Provision of Public Goods." *American Economic Journal: Economic Policy* 9(1): 112–36. DOI: https://doi.org/10.1257/pol.20150394

Benoit, Kenneth. 2006. "Duverger's Law and the Study of Electoral Systems." *French Politics* 4(1): 69–83. DOI: https://doi.org/10.1057/palgrave.fp.8200092

Bertanha, Marinho. 2020. "Regression Discontinuity Design with Many Thresholds." *Journal of Econometrics* 218(1): 216–241. DOI: https://doi.org/10.1016/j.jeconom.2019.09.010

Besley, Timothy, and **Maitreesh Ghatak.** 2006. "Public Goods and Economic Development." *Understanding Poverty* 19: 285–303. DOI: https://doi.org/10.1093/0195305191.003.0019

Besley, Timothy, and **Torsten Persson.** 2009. "The Origins of State Capacity: Property Rights, Taxation, and Politics." *American Economic Review* 99(4): 1218–44. DOI: https://doi.org/10.1257/aer.99.4.1218

Besley, Timothy, and **Torsten Persson.** 2014. "Why Do Developing Countries Tax So Little?" *Journal of Economic Perspectives* 28(4): 99–120. DOI: https://doi.org/10.1257/jep.28.4.99

Blumkin, Tomer, Bradley J. Ruffle, and **Yosef Ganun.** 2012. "Are Income and Consumption Taxes Ever Really Equivalent? Evidence from a Real-Effort Experiment with Real Goods." *European Economic Review* 56(6): 1200–1219. DOI: https://doi.org/10.1016/j.euroecorev.2012.06.001

Bordignon, Massimo, Veronica Grembi, and **Santino Piazza.** 2017. "Who Do You Blame in Local Finance? *An Analysis of Municipal Financing in Italy.*" *European Journal of Political Economy* 49: 146–163. DOI: https://doi.org/10.1016/j.ejpoleco.2017.02.003

Bracco, Emanuele, Francesco Porcelli, and Michela Redoano. 2019. "Political Competition, Tax Salience and Accountability. *Theory and Evidence from Italy." European Journal of Political Economy* 58: 138–163. DOI: https://doi.org/10.1016/j.ejpoleco.2018.11.001

Bradley, Sebastien, and Naomi E. Feldman. 2020. "Hidden Baggage: Behavioral Responses to Changes in Airline Ticket Tax Disclosure." *American Economic Journal: Economic Policy* 12(4): 58–87. DOI: https://doi.org/10.1257/pol.20190200

Britto, Diogo G. C., and Stefano Fiorin. 2020. "Corruption and Legislature Size: Evidence from Brazil." *European Journal of Political Economy* 65: 101940. DOI: https://doi.org/10.1016/j.ejpoleco.2020.101940

Brollo, Fernanda, and Tommaso Nannicini. 2012. "Tying Your Enemy's Hands in Close Races: The Politics of Federal Transfers in Brazil." *American Political Science Review* 106(4): 742–761. DOI: https://doi.org/10.1017/S0003055412000433

Cabral, Marika, and Caroline Hoxby. 2012. "The Hated Property Tax: Salience, Tax Rates, and Tax Revolts." *National Bureau of Economic Research*. DOI: https://doi.org/10.3386/w18514

Calonico, Sebastian, Matias D. Cattaneo, Max H. Farrell, and Rocio Titiunik. 2019. "Regression Discontinuity Designs Using Covariates." *Review of Economics and Statistics* 101(3): 442–451. DOI: https://doi.org/10.1162/rest_a_00760

Calonico, Sebastian, Matias D. Cattaneo, and Rocio Titiunik. 2014. "Robust Nonparametric Confidence Intervals for Regression-Discontinuity Designs." *Econometrica* 82(6): 2295–2326. DOI: https://doi.org/10.3982/ECTA11757

Cattaneo, Matias D., Michael Jansson, and Xinwei Ma. 2018. "Manipulation Testing Based on Density Discontinuity." *The Stata Journal* 18(1): 234–261. DOI: https://doi.org/10.1177/1536867X1801800115

Cattaneo, Matias D., Rocío Titiunik, Gonzalo Vazquez-Bare, and Luke Keele. 2016. "Interpreting Regression Discontinuity Designs with Multiple Cutoffs." *The Journal of Politics*, 78(4): 1229–1248. DOI: https://doi.org/10.1086/686802

Cepaluni, Gabriel, D. Freire, and U. Mignozzetti. 2020. "Legislature Size and Welfare: Evidence from Brazil." Working Paper.

Chattopadhyay, Raghabendra, and Esther Duflo. 2004. "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India." *Econometrica* 72(5): 1409–1443. DOI: https://doi.org/10.1111/j.1468-0262.2004.00539.x

Chen, Jowei, and Neil Malhotra. 2007. "The Law of k/n: The Effect of Chamber Size on Government Spending in Bicameral Legislatures." *American Political Science Review,* 657–676. DOI: https://doi.org/10.1017/S0003055407070566

Chetty, Raj, Adam Looney, and Kory Kroft. 2009. "Salience and Taxation: Theory and Evidence." *American Economic Review* 99(4): 1145–77. DOI: https://doi.org/10.1257/aer.99.4.1145

Colonnelli, Emanuele, Mounu Prem, and Edoardo Teso. 2020. "Patronage and Selection in Public Sector Organizations." *American Economic Review* 110(10): 3071–99. DOI: https://doi.org/10.1257/aer.20181491

Corbi, Raphael, Elias Papaioannou, and Pablo Surico. 2019. "Regional Transfer Multipliers." *Review of Economic Studies,* 86(5): 1901–1934. DOI: https://doi.org/10.1093/restud/rdy069

Cunha, Igor, and Paulo Manoel. 2019. "The Real Effects of Politicians' Compensation." Available at SSRN 3471509. DOI: https://doi.org/10.2139/ssrn.3471509

Dahis, Ricardo, and Christiane Szerman. 2020. "Development via Administrative Redistricting: Evidence from Brazil." Available at SSRN 3125757.

Duverger, Maurice. 1954. Political Parties: Their Organisation and Activity in Themodern State. Methuen & Company.

Egger, Peter, and Marko Koethenbuerger. 2010. "Government Spending and Legislative Organization: Quasi-Experimental Evidence from Germany." *American Economic Journal: Applied Economics* 2(4): 200–212. DOI: https://doi.org/10.1257/app.2.4.200

Eggers, Andrew C., Ronny Freier, Veronica Grembi, and Tommaso Nannicini. 2018. "Regression Discontinuity Designs Based on Population Thresholds: Pitfalls and Solutions." *American Journal of Political Science* 62(1): 210–229. DOI: https://doi.org/10.1111/ajps.12332

Ferraz, Claudio, and Frederico Finan. 2009. "Motivating Politicians: The Impacts of Monetary Incentives on Quality and Performance." *National Bureau of Economic Research*. DOI: https://doi.org/10.3386/w14906

Finkelstein, Amy. 2009. "E-ztax: Tax Salience and Tax Rates." *The Quarterly Journal of Economics* 124(3): 969–1010. DOI: https://doi.org/10.1162/qjec.2009.124.3.969

Frank, Marco, and David Stadelmann. 2021. "More Federal Legislators Lead to More Resources for Their Constituencies: Evidence from Exogenous Differences in Seat Allocations." *Journal of Comparative Economics* 49(1): 230–243. DOI: https://doi.org/10.1016/j.jce.2020.07.008

Freire, Danilo, Umberto Mignozzetti, Catarina Roman, and Huzeyfe Alptekin. 2021. "The Effect of Legislature Size on Public Spending: A Meta-Analysis." DOI: https://doi.org/10.31235/osf.io/xf7wp

Fujiwara, Thomas. 2011. "A Regression Discontinuity Test of Strategic Voting and Duverger's Law." *Quarterly Journal of Political Science* 6(3–4): 197–233. DOI: https://doi.org/10.1561/100.00010037

Fujiwara, Thomas. 2015. "Voting Technology, Political Responsiveness, and Infant Health: Evidence from Brazil." *Econometrica* 83(2): 423–464. DOI: https://doi.org/10.3982/ECTA11520

Galindo-Silva, Hector. 2021. "Political Openness and Armed Conflict: Evidence from Local Councils in Colombia." *European Journal of Political Economy,* 67: 101984. DOI: https://doi.org/10.1016/j.ejpoleco.2020.101984

Galletta, Sergio, and Elliott Ash. 2019. "How Cable News Reshaped Local Government." Available at SSRN 3370908.

Garmann, Sebastian. 2014. "The Causal Effect of Coalition Governments on Fiscal Policies: Evidence from a Regression Kink Design." *Applied Economics,* 46(36): 4490–4507. DOI: https://doi.org/10.1080/00036846.2014.964831

Gaspar, Vitor, Laura Jaramillo, and Mr Philippe Wingender. 2016. Political Institutions, State Building, and Tax Capacity: Crossing the Tipping Point. International Monetary Fund. DOI: https://doi.org/10.2139/ssrn.2902727

Gelman, Andrew, and Guido Imbens. 2019. "Why High-Order Polynomials Should Not Be Used in Regression Discontinuity Designs." *Journal of Business & Economic Statistics* 37(3): 447–456. DOI: https://doi.org/10.1080/07350015.2017.1366909

Goldin, Jacob. 2015. "Optimal Tax Salience." *Journal of Public Economics* 131: 115–123. DOI: https://doi.org/10.1016/j.jpubeco.2015.09.005

Gouvea, Raphael, and Daniele Girardi. 2021. "Partisanship and Local Fiscal Policy: Evidence from Brazilian Cities." *Journal of Development Economics* 150: 102637. DOI: https://doi.org/10.1016/j.jdeveco.2021.102637

Halse, Askill H. 2016. "More for Everyone: The Effect of Local Interests on Spending on Infrastructure." *European Journal of Political Economy* 43: 41–56. DOI: https://doi.org/10.1016/j.ejpoleco.2016.02.003

Hix, Simon, Rafael Hortala-Vallve, and Guillem Riambau-Armet. 2017. "The Effects of District Magnitude on Voting Behavior." *The Journal of Politics* 79(1): 356–361. DOI: https://doi.org/10.1086/688889

Höhmann, Daniel. 2017. "The Effect of Legislature Size on Public Spending: Evidence from a Regression Discontinuity Design." *Public Choice* 173(3): 345–367. DOI: https://doi.org/10.1007/s11127-017-0484-2

Klašnja, Marko, and Rocío Titiunik. 2017. "The Incumbency Curse: Weak Parties, Term Limits, and Unfulfilled Accountability." *American Political Science Review* 111(1): 129–148. DOI: https://doi.org/10.1017/S0003055416000575

Laakso, Markku, and Rein Taagepera. 1979. "Effective Number of Parties: A Measure with Application to West Europe." *Comparative Political Studies* 12(1): 3–27. DOI: https://doi.org/10.1177/001041407901200101

Lewis, Blane D. 2018. "Endogenous District Magnitude and Political Party Fragmentation in Subnational Indonesia: A Research Note." *Electoral Studies* 55: 136–145. DOI: https://doi.org/10.1016/j.electstud.2018.06.005

Lewis, Blane D. 2019. "Legislature Size, Local Government Expenditure and Taxation, and Public Service Access in Indonesia." *Studies in Comparative International Development* 54(2): 274–298. DOI: https://doi.org/10.1007/s12116-019-09278-1

Litschig, Stephan, and Kevin M. Morrison. 2013. "The Impact of Intergovernmental Transfers on Education Outcomes and Poverty Reduction." *American Economic Journal: Applied Economics* 5(4): 206–40. DOI: https://doi.org/10.1257/app.5.4.206

Luo, Renfu, Linxiu Zhang, Jikun Huang, and Scott Rozelle. 2010. "Village Elections, Public Goods Investments and Pork Barrel Politics, Chinese-Style." *The Journal of Development Studies* 46(4): 662–684. DOI: https://doi.org/10.1080/00220380903318061

Mainwaring, Scott. 1998. "Electoral Volatility in Brazil." *Party Politics* 4(4): 523–545. DOI: https://doi.org/10.1177/1354068898004004006

Matějka, Filip, and Guido Tabellini. 2016. "Electoral Competition with Rationally Inattentive Voters." *Journal of the European Economic Association.* DOI: https://doi.org/10.2139/ssrn.2774041

Miguel, Edward, and Mary Kay Gugerty. 2005. "Ethnic Diversity, Social Sanctions, and Public Goods in Kenya." *Journal of Public Economics* 89(11–12): 2325–2368. DOI: https://doi.org/10.1016/j.jpubeco.2004.09.004

Miller, Gary J., and Terry M. Moe. 1983. "Bureaucrats, Legislators, and the Size of Government." *The American Political Science Review,* 297–322. DOI: https://doi.org/10.2307/1958917

Naritomi, Joana. 2019. "Consumers as Tax Auditors." *American Economic Review* 109(9): 3031–72. DOI: https://doi.org/10.1257/aer.20160658

Novaes, Lucas M. 2018. "Disloyal Brokers and Weak Parties." *American Journal of Political Science* 62(1): 84–98. DOI: https://doi.org/10.1111/ajps.12331

Okunogbe, Oyebola Motunrayo, and **Victor Pouliquen.** 2018. "Technology, Taxation, and Corruption: Evidence from the Introduction of Electronic Tax Filing." *World Bank Policy Research Working Paper* 8452. DOI: https://doi.org/10.1596/1813-9450-8452

Pettersson-Lidbom, Per. 2012. "Does the Size of the Legislature Affect the Size of Government? *Evidence from Two Natural Experiments." Journal of Public Economics* 96(3–4): 269–278. DOI: https://doi.org/10.1016/j.jpubeco.2011.07.004

Power, Timothy J., and **Rodrigo Rodrigues-Silveira.** 2019. "Mapping Ideological Preferences in Brazilian Elections, 1994–2018: A Municipal-Level Study." *Brazilian Political Science Review* 13. DOI: https://doi.org/10.1590/1981-3821201900010001

Rocha, C. A. A. 2019. "Brazilian Federal Transfers to States and Municipalities: A Quick Reference Guide." Nucleo de Estudos e Pesquias, CONLEG/Senate, Discussion Paper 263.

Sances, Michael W. 2017. "Attribution Errors in Federalist Systems: When Voters Punish the President for Local Tax Increases." *The Journal of Politics* 79(4): 1286–1301. DOI: https://doi.org/10.1086/692588

Sánchez De La Sierra, Raúl. 2020. "On the Origins of the State: Stationary Bandits and Taxation in Eastern Congo." *Journal of Political Economy* 128(1). DOI: https://doi.org/10.1086/703989

Sausgruber, Rupert, and **Jean-Robert Tyran.** 2005. "Testing the Mill Hypothesis of Fiscal Illusion." *Public Choice* 122(1–2): 39–68. DOI: https://doi.org/10.1007/s11127-005-3992-4

Schneider, Rodrigo, Diloá Athias, and **Mauricio Bugarin.** 2019. "Does Enfranchisement Affect Fiscal Policy? *Theory and Empirical Evidence on Brazil." Economics of Governance* 20(4): 389–412. DOI: https://doi.org/10.1007/s10101-019-00230-6

Shi, Maggie, and **Andrea Tulli**. 2020. "Does Decentralization Matter? Evidence from Italian Municipalities." NTA.

Slack, Enid, and **Richard M. Bird.** 2014. "The Political Economy of Property Tax Reform." OECD Publishing OECD Working Papers on Fiscal Federalism 18.

Slemrod, Joel. 2019. "Tax Compliance and Enforcement." *Journal of Economic Literature* 57(4): 904–54. DOI: https://doi.org/10.1257/jel.20181437

Ter-Minassian, Teresa. 2012. "Reform Priorities for Sub-National Revenues in Brazil." Available at SSRN 2102141. DOI: https://doi.org/10.2139/ssrn.2102141

Ting, Michael M., Shigeo Hirano, and **James M. Snyder Jr.** 2018. "Primary Elections and the Provision of Public Goods." *The Journal of Politics* 80(2): 647–661. DOI: https://doi.org/10.1086/694788

Weigel, Jonathan L. 2020. "The Participation Dividend of Taxation: How Citizens in Congo Engage More with the State When It Tries to Tax Them." *The Quarterly Journal of Economics* 135(4): 1849–1903. DOI: https://doi.org/10.1093/qje/qjaa019

Weingast, Barry R., Kenneth A. Shepsle, and **Christopher Johnsen.** 1981. "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics." *Journal of Political Economy* 89(4): 642–664. DOI: https://doi.org/10.1086/260997