

When Does Clientelism Pay Off? Legislature Size and Welfare in Brazil*

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Abstract

What is the effect of clientelism on voters' welfare? This paper shows that clientelism may occasionally improve welfare. Starting with a model of clientelistic services provision, we investigate which types of services clientelism impacts on. We take advantage of exogenous changes in city-council size in Brazil to test our theory, varying the number of councilors in highly clientelistic settings. While we find that the addition of a councilor(s) has a null effect on education quality and preventive health care, we do observe improvements in infant mortality and primary school enrollment. Additionally, we find that more councilors increases patronage and that councilors believe they benefit electorally from clientelism. In sum, increasing clientelistic supply improves those public services voters' want and which clientelistic machines can capture. This skews policy enhancement away from welfare services that are not electorally promising, suggesting that clientelistic exchanges may also harm welfare.

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Introduction

Clientelism, defined as the exchange of gifts and personal benefits for votes, is one of the most prevalent problems in democracies around the world. Under clientelism, politicians

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restrict access to public services, distributing them according to their electoral interests.¹ This distortion creates incentives whereby voters choose politicians based on individual and personalistic reasons, instead of on their policy platforms (Stokes et al. 2013). In this sense, clientelism negatively affects democracy, decreasing political competition; increasing incentives for corruption; and undermining democratic legitimacy (Hicken 2011).

However, the welfare effects of clientelism—positive and negative—remain to be studied.² Consider a situation in which a mother is trying to get access to a hospital for her sick child. In this case, if a politician were to help her, it would improve both her welfare and that of the child. But, if this motivates the mother to neglect the politician’s policy proposals, then politicians will prioritize personal exchanges instead of policies. Since these two forces may be present, it is difficult to predict whether clientelism improves welfare. Moreover, clientelistic exchanges privilege services that can be targeted at the individual level, and that are desired by voters. This may create a situation in which only certain types of services improve with clientelism. So, what is the welfare effect of clientelism?

To solve this puzzle, we need to study changes in the amount of clientelism keeping all other characteristics constant. Fortunately, in Brazil, a quasi-experimental variation in city council size provides an ideal opportunity to answer our puzzle. In 2004, a Supreme Court reinterpretation of the 1988 Brazilian Constitution unexpectedly changed the number of city councilors in Brazilian municipalities. Before 2003, municipalities in Brazil could freely choose their council size. But in March 2004, the Superior Electoral Tribunal created population thresholds for council size, adding one councilor for each set of 47,671 inhabitants, in every municipality with less than a million inhabitants. In Brazil, as city councilors implement clientelistic policies (Leal 1975; Ames 1995, 2001; Castro et al. 2009; Nichter 2011; Braga et al. 2013; Boas et al. 2014), an increase in council size affects the amount of clien-

¹Clientelism assumes a variety of forms: general *quid pro quo* arrangements and politician-broker-voter relationships (Stokes 2005; Stokes et al. 2013; Larreguy 2013), vote buying (Nichter 2014; Khemani 2015; Kramon 2016), turnout buying (Hidalgo and Nichter 2016; Larreguy et al. 2016), and patronage (Robinson and Verdier 2013), among others. A comprehensive literature review can be found on Hicken (2011).

²There is a consensus that clientelism harm long-term economic welfare, but the short-term effects are sparse. For instance, Keefer and Vlaicu (2008) show that clientelism may generate short-term benefits, as in weakly institutionalized states it is a more credible form of redistribution than programmatic politics. Robinson and Verdier (2013), commenting Bates, also agree that clientelism is a form of making incentive-compatible promises to voters. Conversely, Vicente and Wantchekon (2009) and Stokes et al. (2013) argue that clientelism diverts funds from public goods provision toward inefficient redistributive policies, harming welfare.

telism about seven months before elections.³ In sum, the population thresholds for council size in Brazil provide a variation in clientelistic supply that allows us to observe the welfare effects of clientelism.

Studying the 2005 to 2008 mayoral term, we find that increasing the council size by one legislator lowers infant mortality by 1.98 per one thousand infants born and increases elementary school enrollment by 2.58 children per kindergarten classroom. Hence, politicians practicing clientelism tend to favor services that can be traded for votes. Arranging hospital care and school enrollment are great services for performing such exchanges; they represent immediate voter demands which a politician can resolve with a mere telephone call and which can heavily impact a voter's behavior by generating feelings of reciprocity toward the politician.⁴

By the clientelistic logic, services that are neither targetable nor sensitive to voters, should not change with the uptrend in clientelism. Indeed, we find no influence of city council size on: the number of families enrolled in the Family Health Program, the major preventive care program in Brazil; the proportion of infants born to mothers who accessed more than six prenatal care consultations; and primary and middle school education quality indicators. Preventive care is harder to target, and from a clientelist politician's perspective, education quality investments take too long to pay off. Also, education quality correlates with less poverty, which has been shown to harm future clientelistic exchanges (Nazareno et al. 2008; Stokes et al. 2013).

These improvements could, however, be the result of better legislative policies or increased oversight over bureaucracy, which are formal duties of Brazilian city councilors. We present three pieces of evidence to disregard this possibility. First, new councilors tend to have more access to public resources. An additional council member belongs to the mayoral coalition 91% of the time. This is key to accessing public services, as mayors control service

³Although the literature emphasizes that city councilors in Brazil tend to favor clientelistic strategies, we also provide empirical evidence in this regard. See section 5 in this paper.

⁴As the famous remark from the Tammany Hall machine operative goes, "*The poor are the most grateful people in the world*" (Stokes et al. 2013). It can be argued that this still holds true in most developing economies (Finan and Schechter 2012; Stokes et al. 2013; Lawson and Greene 2014), despite secret ballot laws. This because politicians can either exploit reciprocity feelings or expectations voters hold of keeps receiving benefits from said politicians.

allocation in Brazilian municipalities. Second, the addition of a city councilor increases significantly the incidence of patronage. One extra councilor represents the addition of over one hundred politically appointed employees to the municipality. Finally, we analyze an online survey we ran among then active city councilors, showing that most councilors perceived clientelistic exchanges as electorally attractive and believed that more councilors tended to prefer clientelistic exchanges vis-à-vis lawmaking and oversight duties.⁵ We also consider three alternative explanations: an increased representation of women and non-white legislators; a change in electoral competitiveness; and a larger fraction of approved legislation, vis-à-vis the legislation that was presented by councilors. These alternative mechanisms remain unchanged when we vary council size, demonstrating that the clientelistic explanation is the most preeminent.

Hence, this paper shows that clientelism can ameliorate some services, but these improvements are not widespread to all public services. In fact, when we increase the scope of clientelism, only those services that politicians may target, such as hospital beds, distribution of medication, or school enrollment, show improvement. In health care, for example, post neonatal infant mortality improves, but preventive health care remains unchanged. The main conclusion in terms of welfare is that if a service cannot be allocated in a clientelistic fashion, either because voters care little about it or because it is harder to target in *quid pro quo* exchanges, then politicians will exert little effort towards improving such a service. Therefore, while clientelism can lead to some welfare improvements, these benefits are very limited in scope and skewed towards clientelistic services.

We structure this paper as follows. Section 1 builds a theory to explain the welfare consequences of clientelism. Section 2 provides background on Brazilian municipalities, discussing their political and social organization. Section 3 presents our investigation into the main variables used in the paper, as well as the city councilor's survey we fielded and the identification strategy to run the Regression Discontinuity when we have multiple cutoffs. Section 4 presents the main welfare results and our discussion of how clientelism skews

⁵On average, 70% of respondents reported that clientelistic exchanges — such as distributing medication to voters — secures more votes than lawmaking (25%) or government oversight (30%). Moreover, councilors argued that more than six councilors (6.21) used to perform clientelistic activities, vis-à-vis lawmaking (3.45), and oversight activities (4.04).

the provision of services toward services that can be distributed by the councilor. Section 5 investigates the mechanics behind the clientelistic exchange. The paper concludes by discussing the implications of our findings for welfare in clientelistic settings.

1 From Clientelism to Public Services

The impact of clientelism on politics has been widely studied. Since the seminal work of [Scott \(1972\)](#), political scientists have advanced our understanding on contingent exchanges between politicians and voters. More recently, the clientelism literature successfully explained how voter-broker relationships work ([Stokes et al. 2013](#); [Larreguy 2013](#)), and also detected a variety of forms that clientelistic exchanges may take ([Nichter 2011](#); [Hidalgo and Nichter 2016](#); [Larreguy et al. 2016](#)).

However, while exchanging access to public services for votes is morally questionable and politically problematic, few scholars have studied how clientelism affects welfare ([Hicken 2011](#)). Let us consider that an optimal allocation of resources combines services that improve welfare in ways that matter to voters, with services that also improve welfare, but in ways that voters perceive as less important. For instance, to provide health care effectively, we not only need to cure sick individuals, but also invest in preventive care so fewer people get sick. Unfortunately, when compared with those theoretical allocations, clientelism produces awful welfare results. [Bardhan and Mookherjee \(2012\)](#) and [Anderson et al. \(2015\)](#) show that we rarely witness policies aimed at the poor in countries with widespread poverty. The researchers explain that elites capture the political system using clientelistic policies, implementing policies that strengthen said elites. [Robinson and Verdier \(2013\)](#) show that patronage hinders welfare because the reason for hiring public servants is to guarantee they commit to the clientelistic machines.

On the other hand, even when politicians are accountable to voters, democracies rarely achieve socially optimal results, but are closer to such high standards ([Acemoglu and Robinson 2012](#); [Acemoglu et al. 2014](#)). In this sense, politicians and political brokers would want to improve services they can use in clientelistic exchanges, leaving non-targetable services

aside. In this sense, clientelism may produce some eventual benefits, which can potentially explain why it endures even in some developed societies (Hicken 2011). Thus, we need a theory to understand whether the negative results of clientelism are widespread in the political system or are concentrated on certain services. Additionally, contributing to this area is key to developing a better picture of how clientelism influences policy outcomes, providing fruitful insights into designing better institutions for developing countries.

To understand what should happen when we increase the amount of clientelism, consider two key variables for service provision. First, voters have their own preferences regarding public services, and these preferences sometimes do not match with long-term welfare improvement policies.⁶ For example, poor citizens in India prefer to have antibiotics prescribed instead of taking preventive measures (Banerjee and Duflo 2012). Parents want to enroll their kids in a good school, but usually are unable to perfectly evaluate school quality. Therefore, they will settle for their children's expedited enrollment in a school of choice. In this sense, the voter prefers policies that are not necessarily good for welfare. We label the voter's preferences as *policy salience*.⁷

Second, the distribution of some services is not perfectly manageable by politicians. For instance, politicians cannot easily restrict the access to municipal public goods. High quality schools, hospitals, clean water, and sewage systems are not easier to target. However, services such as access to public hospitals and clinics, medication distribution, school enrollment, among others, can be targeted at the individual level. We call this characteristic *policy targetability*.

Considering these two variables together, we have a better picture of what should hap-

⁶The reasons for that are threefold. First, poor voters do not understand the mechanics of welfare-provision services, and that is why they cannot understand the benefits of vaccines versus antibiotics (Banerjee and Duflo 2012). Second, improving some services, such as education quality, requires investments in the present that only pay off in the future. If voters were myopic, then they would prefer to invest in other types of services, such as monetary transfers, that would give them immediate benefits, justifying strategies such as vote buying. Finally, we know that differences in ability to pay versus social need of a service determines corruption incentives for bureaucrats (Banerjee 1997). We may apply the same mechanism for clientelistic incentives changing bureaucrats for politicians. Feelings of reciprocity are only triggered by a sufficient difference between ability and need. This may incentive politicians to under-provide preventive care, in order to over-provide services that would link them with voters, such as hospital care.

⁷Here we use the term *policy salience* as voter's preference (ideal point proximity), different from the social psychology *personal policy salience* (Duncan 2005).

pen as a politician decides about service provision.⁸ Let us suppose a change in clientelistic supply due to the addition of politicians in a clientelistic setting. What should we expect?

First, consider services that are non-targetable at the individual level, and non-salient for the voter. For instance, services such as education quality, that are expensive and take longer to pay off. In this case, we should expect no changes in these services when we add clientelist politicians. On the other hand, education quality improvements are mentioned in most Brazilian party programs. Following our logic, if the representation were programmatic, we would witness improvements in such services.

Second, consider services that are non-salient, but that are targetable. Preventive health care falls in this category, as a politician could technically bring nurses to houses and target these services to their constituency. In this sense, we should not expect any change from an upward trend in clientelism, as clientelistic politicians would not want to invest in services to which voters do not attach a sense of immediate reward.

Third, consider services that are salient, but that are non-targetable. For example, improving a local street does not help everyone that uses public roads, but a politician cannot specifically target within the community who will benefit from the service. Additionally, consider investments in clean water. It stands to reason that voters in general would prefer clean water, but it is difficult for politicians to selectively target these improvements. Thus, we should expect that politicians, regardless of their clientelistic intentions, have incentives to improve these services. But with clientelist politicians, we expect that these changes would be less intense, as they would prefer to invest their resources on targetable policies.

Finally, consider services that are both salient and targetable. Under clientelism, as politicians want to maximize their exposure, they prefer to invest in services whose provision can effectively be tied to their personal image. In this sense, distributing medication, providing private ambulances, helping with kindergarten enrollment, among other services, are perfect for clientelism, and should improve with it (Kuschnir 2000; Pase et al. 2014; Vieira

⁸In this sense, this paper follows the contribution from Kramon and Posner (2013), that in order to understand the impacts of clientelism on welfare we should consider a diverse bundle of public services. Moreover, although our analysis overlaps with the classical concepts of public and private goods, our discussion intends to study the diverse forms of public service provision from the distributive politics perspective.

2015).⁹ Table 1 summarizes our argument, discussing the expected effects of clientelism on services, considering these two dimensions.

Table 1: *Effects of Clientelism on Public Services*

| | Non-Targetable | Targetable |
|--------------------|--------------------------------|--------------------------------|
| Non-Salient | Null or Negative Effect | Null or Weakly Negative Effect |
| Salient | Null or Weakly Positive Effect | Positive Effect |

In this sense, differentiating among services is fundamental when studying distributive politics (Kramon and Posner 2013; Albertus 2015). For instance, if we look at infant mortality, providing an ambulance to transport a sick child to a hospital promptly may save lives, improving this key welfare outcome. However, if that the child is sick with an illness that could have been prevented with a vaccination, then only more programmatic policies, aimed at services that are not fully understood by voters, can improve welfare.

In sum, these considerations suggest that instead of looking for unconditional positive or negative effects, clientelism should manifest diversely, conditional on the type of service studied. On the one hand, if a service is targetable at the individual level and voters are likely to reward the politician that delivers it, then upward trends in clientelism will improve these services. Otherwise, only programmatic politics could have a positive impact on all services.

2 The Brazilian Case: Background

Brazil has 5,565 municipalities. According to the Brazilian Constitution, each municipality has to provide health care, primary education, transportation, and basic infrastructure such as paved streets, potable water, and sewage, among other public services. They propose local laws, and collect taxes on housing and services. This tax revenue is around 5% of all

⁹In the Online Supplemental materials we present a formal model using two goods and varying their salience. We show that expanding the legislature makes voters want more services, but they prefer ones that are salient. Only when the politician is perfectly aligned with the voters do we observe socially optimal provision.

collected taxes in Brazil, but municipalities receive a considerable portion of transfers from the central government, aiming for the general provision of services but with specific transfers to organize the health care and education system. Municipalities also receive resources to implement federal social welfare programs, such as the *Bolsa Familia*.¹⁰

A mayor and a city council ranging from 9 to 55 councilors govern a municipality. Both mayors and councilors are elected by direct vote in the same election. The mayor, who has a more prominent role, may propose laws, tax changes, and organize the provision of goods and services, as well as the bureaucratic organization. The mayor presents these policies as proposals to the city council, which can accept or reject them. Moreover, councilors allied with the mayor have more access to public resources and greater influence over policy outcomes.¹¹

For the city council, the constitution states that councilors have two main duties. First, they propose, discuss, and vote on legislation put forward by themselves or by the mayors. Second, they oversee municipal accounts, the bureaucracy, and the provision of public services.

Additionally, voters ask councilors for an array of political and personal favors. For instance, it is very common for city councilors to help voters access public hospitals, transport patients to specialized hospitals, get prescription medication, facilitate school enrollment or public employment, and even pay utility bills, settle debts, and buy food (Nichter 2011). Lopez and Almeida (2012) conducted interviews in twelve municipalities in the state of Minas Gerais; they found that councilors spend most of their time answering personal favors. Echoing most of the 108 interviews, one councilor stated that she receives "... all kinds of requests. From LPG gas cylinders to airfare, and everything in between: staples, medication, utility bills, rent, airfare, fares for ground transportation, aid, fifty reais, grocery bills...

¹⁰Articles 23, 29, 31, and 156 of the Brazilian Constitution regulate municipal attributions and obligations, size of legal organizations and city council, oversight of municipal expenditures by city council, and taxation, respectively. Different from American federalism, the Constitution in Brazil mandates that municipalities can only legislate on the issues the constitution allows. Moreover, the electoral justice imposes that parties need to have a national basis. These requirements make the Brazilian municipal system fairly standardized throughout the country.

¹¹One might ask whether the councilors are that important, provided that the mayors in Brazil concentrate considerable power in their hands. On that note, Albertus (2015) shows that in Venezuela, local level politicians are the agents for the federal clientelistic machines.

(Councilor M. M.)¹²” (IPEA 2012). In all interviews, Lopez and Almeida (2012) detected that councilors spend a large portion of their time attending to personal or group requests. Moreover, most of the literature emphasizes that councilors in Brazil spend most of their time answering personal or group clientelistic favors (Nichter 2011; Lopez and Almeida 2012; Braga et al. 2013).

Regarding the city council organization, the most important component is its size. From 1988 to 2004, the constitution loosely set rules regarding the number of seats. Due to a loose interpretation of the constitutional rule about the number of politicians in each municipality, some places ended up with either a very large or a very small number of councilors.¹³ In 2003, the council-size problem gained visibility as a small municipality in São Paulo, namely Mira Estrela, with only 2,651 residents, reduced their city council from 11 to 9 seats. The change motivated a judicial dispute that reached the Supreme Court. The Court favored the municipality’s decision and ruled that the size of any city council should correspond with precise population thresholds.

Following this decision, in March 2004, the Superior Electoral Tribunal (TSE) issued Resolution 21,702/2004, establishing a series of population thresholds for all municipal legislatures. The change regulated the city council’s size for the 2004 election and was based on the 2003 population projections by the Brazilian Institute of Geography and Statistics (IBGE). The resolution presented the following reasoning: first, municipalities must have at least nine councilors. For populations falling in the range of zero to a million inhabitants, the maximum is 21 councilors. Therefore, the Electoral Tribunal Judges divided a million by 21, getting a threshold of 47,619 inhabitants. They started with nine legislators, increasing one by one until it reached 21. Then the council size remained constant from 571,428 ($12 \times 47,619$) to one million inhabitants. After that, the cutoff jumps to 33 and increases one by one up to the maximum number of legislators allowed, 55. We are not using these cutoffs as

¹²In Portuguese, “... são pedidos de toda ordem. (...) De botijão de gás até passagem aérea. Ai entra tudo, cesta básica, remédio, pagamento de tarifa de luz, água, telefone, aluguel, passagem aérea, passagem terrestre, ajuda, cinquenta reais, pagamento de contas avulsas no mercado...”.

¹³As an illustration, Nova Russas in Ceará used to have 21 city councilors with only 30 thousand inhabitants (around one legislator per 1,429 citizens). On the other extreme, Sorocaba in São Paulo, had only 15 councilors with more than 500 thousand inhabitants (one legislator per 35,249 citizens).

they have very few municipalities around them.¹⁴

This decision makes Brazil the ideal testing ground for our theory. City councilors are the lowest level politicians in Brazil, and they operate the clientelistic machines at the municipal level (Kuschnir 2000; Nichter 2011; Lopez and Almeida 2012; Pase et al. 2014; Vieira 2015). The change in council size seven months before the election made it impossible for candidates to change their electoral strategies for the 2004 election. Therefore, when we observe the 2005 to 2008 term, we have the possibility of studying an increase in the supply of clientelism, holding other characteristics constant. The next section explains how we exploit this exogenous change in council size and recover the causal effect of increasing clientelism in a quasi-experimental way.

3 Variables, Data Sources, and Identification Strategy

We use three groups of variables in this paper: first, a group representing the municipalities' characteristics that are supposed to remain constant around the discontinuities (pre-treatment variables); second, the welfare outcome variables, the main indicators of health care and education in the Brazilian municipalities; and third, the variables used to uncover the mechanism driving the results. We collected variables for the 2005–2008 study period, not to mention variables from the the Electoral Justice in 2004 and the 2000 census. Moreover, we also include data from an online survey we conducted to explore the main mechanism. The summary statistics of all variables used in this paper are in Table 2.¹⁵

As pre-treatment variables, we study four municipal characteristics: 1) the number of city council seats in the 2000 election; 2) the population in 2000; 3) the municipal GDP in 2000; and 4) the proportion of poor families in 2000. The first variable comes from the Superior Electoral Tribunal (Tribunal Superior Eleitoral–TSE) and the remaining variables from the 2000 Census conducted by the Brazilian Institute of Geography and Statistics (Instituto

¹⁴There are three others that used the same discontinuities. First, [Corrêa \(2014\)](#) shows the results for infant mortality, but he does not use any correction for multiple cutoffs. Second, [Corbi and Papaioannou \(2014\)](#) perform a difference-in-discontinuity to study shocks in budget. Finally, [Britto and Fiorin \(2016\)](#) study corruption incentives.

¹⁵In the Online Supplemental Materials, section B.2, we present a more detailed explanation of our variables' sources.

Table 2: Summary Statistics

| Statistic | N | Mean | St. Dev. | Min | Max |
|--|--------|-----------|-----------|------|---------|
| Municipal Characteristics | | | | | |
| Number of Seats 2000 | 5,521 | 10.76 | 2.70 | 9 | 21 |
| Population 2000 | 5,474 | 22,341.96 | 44,573.67 | 697 | 567,728 |
| Per-Capita GDP Census 2000 (in thousands) | 5,474 | 0.13 | 0.46 | 0.00 | 13.57 |
| Proportion of Poverty Census 2000 | 5,474 | 46.58 | 22.82 | 2.89 | 93.02 |
| Number of Seats 2004 | 5,527 | 9.22 | 0.94 | 9 | 21 |
| Health Care Outcomes | | | | | |
| Infant Mortality 2005-2008 | 13,328 | 20.64 | 13.45 | 1.28 | 209.30 |
| Post-Natal Mortality Rate 2005-2008 | 6,113 | 9.29 | 8.64 | 0.59 | 200.00 |
| Coverage Family Health Program 2005-2008 | 20,576 | 80.07 | 32.05 | 0.00 | 794.01 |
| Prop. Born w. 6+ Pre-Natal 2005-2008 | 16,577 | 54.02 | 24.30 | 0.57 | 100.00 |
| Education Outcomes | | | | | |
| Enrollment Elementary School 2005-2008 | 10,842 | 20.62 | 5.32 | 1.00 | 57.80 |
| Enrollment Middle School 2005-2008 | 7,887 | 25.18 | 7.25 | 1.00 | 92.50 |
| Quality of Elementary School Index 2005-2008 | 9,266 | 3.73 | 0.94 | 0.70 | 8.10 |
| Quality of Middle School Index 2005-2008 | 5,566 | 3.21 | 0.76 | 0.30 | 6.60 |
| Clientelism and Patronage | | | | | |
| Mayoral Coalition Size 2004 | 5,522 | 4.86 | 1.71 | 0 | 17 |
| Number of Appointed Bureaucrats 2005-2008 | 16,563 | 67.77 | 126.68 | 0 | 2,894 |
| Number of Career Bureaucrats 2005-2008 | 16,558 | 436.13 | 698.17 | 0 | 11,633 |
| Number Councilor Assistants 2005 | 5,523 | 4.63 | 8.55 | 0 | 213 |
| Alternative Explanations | | | | | |
| Number Female Elected 2004 | 5,526 | 1.12 | 1.20 | 0 | 8 |
| Number Non-White Elected 2004 | 397 | 2.23 | 1.87 | 0 | 9 |
| Competition per Seat 2004 | 5,527 | 6.27 | 3.82 | 1.00 | 25.83 |
| Proportion Approved Legislation 2005 | 3,694 | 0.83 | 0.28 | 0.00 | 1.00 |
| Survey – Electoral Attractiveness of Services | | | | | |
| Votes Help Hospital Enrollment | 174 | 0.82 | 0.38 | 0 | 1 |
| Votes Help with Medication | 174 | 0.71 | 0.46 | 0 | 1 |
| Votes Help School Enrollment | 174 | 0.59 | 0.49 | 0 | 1 |
| Votes Discuss Legislation | 174 | 0.22 | 0.42 | 0 | 1 |
| Votes Oversee Construction | 174 | 0.24 | 0.43 | 0 | 1 |
| Votes Oversee School Quality | 174 | 0.29 | 0.45 | 0 | 1 |
| Survey – Number Politicians by Activity | | | | | |
| Number Clientelistic Counselors | 174 | 6.10 | 3.65 | 0 | 21 |
| Number Legislate Counselors | 174 | 3.53 | 2.69 | 0 | 17 |
| Number Oversight Counselors | 174 | 3.95 | 2.68 | 0 | 16 |

Notes: The sources and further information about the survey are in the Online Supplementary Information. The survey summary statistics here are unweighted. Numbers of cases vary because of missing data, and because sometimes there was no data for a given year. We coded by hand the number of non-white, based on Facebook and Electoral Justice Website pictures.

Brasileiro de Geografia e Estatística–IBGE). These variables, collected before the population threshold resolution, are great for checking the validity of our research design, which relies on finding null results for these outcomes.

To measure welfare, we collect variables on health care and education provision. For health care, we use four indicators, divided into two groups: general and preventive health care. To measure general care, we collect data on infant mortality and postnatal infant mortality. To measure preventive health care, we collected the proportion of families enrolled in the Family Health Program (Programa Saúde da Família)¹⁶ and the proportion of pregnant women that attended at least seven prenatal care consultations. All variables are from the Brazilian Ministry of Health data center (DataSUS).

For education, we also use two groups of indicators: enrollment and quality. The first two variables measure the average enrollment in the two levels of education: primary (K–4) and secondary (5–8). The last two variables measure quality of education using the official Education Development Index (Índice de Desenvolvimento da Educação Básica–IDEB), issued every odd year since 2005 by the Ministry of Education. The Education Development Index is comprised of a weighted average of Portuguese and Math achievements in a national examination and age-grade compatibility.

To investigate the mechanisms driving the results, we propose measures of clientelism, patronage, and other likely explanations for our results. We group the mechanism outcomes into two groups: The first group is composed of the clientelistic explanation. We have four variables in this group: first, the number of councilors in the mayoral coalition, collected from the Superior Electoral Tribunal website; second, the number of politically appointed employees, collected from the Brazilian Institute of Geography’s website; third, the number of career employees, collected from the Brazilian Institute of Geography, in order to check if councilors improve state capacity. Finally, we investigate whether the increase in the number of appointed employees comes from the councilors’ cabinets using data from the Inter-Legis legislative survey of 2005. These outcomes stand for different facets of the clientelistic

¹⁶The Family Health Program is a Federal program that focuses on primary care of families, providing an array of non-hospital services such as nutritionists, psychologists, dentists, and other services that poor families cannot easily access. Also, it stresses preventive care in the form of regular community based interventions.

exchange. The first represents access to resources; the second represents attempts to solve clientelistic commitment problems while rewarding political brokers. The last two check whether programmatic politics were driving government expansion.

The second group of mechanism variables is comprised of likely alternative explanations for our results. For instance, it would be reasonable to assume that council size could affect councils' demographic composition, number of approved legislation, or even electoral competition. In the Appendix we test for these possibilities showing that only the clientelistic mechanism remains valid.

Lastly, we question whether better policies are driving our results. For instance, increasing the number of politicians aligned with mayors may facilitate welfare policies; in order to implement these policies, mayors will have to appoint more employees. In this scenario, the changes are not because of clientelism but better policy implementation. To rule out this possibility, we ran an online survey with 173 former city councilors during the period, asking them two questions. First, which policies, among clientelistic, purely legislative, and oversight policies, were more electorally attractive? Second, how many politicians engaged in clientelistic, legislative, and oversight efforts in their municipalities? These questions helped clarify whether the results are caused by clientelism in the municipality. Together, all this evidence provides a clear picture of the pattern of representation in Brazil, from macro-level welfare consequences to micro-level clientelistic mechanics.

Regarding the empirical strategy, to determine the effect of clientelism on welfare using the legislature size, a "naive" strategy would be to regress the number of seats on the welfare outcomes. However, if municipalities choose their council size at will, this could correlate with service delivery and would make it impossible to causally estimate the effect of clientelism on public services.

To overcome these problems, we use regression discontinuity design (RDD), exploiting the population thresholds established by the Superior Electoral Tribunal resolution. These thresholds represent a source of exogenous variation in the municipalities' city-council size. As these cutoffs were implemented in the 2004 elections, politicians could not foresee the changes and optimally adapt to them. Consequently, around each cutoff, the municipalities

are arbitrarily similar, with the only difference being their city-council sizes.

Figure 1 displays the distribution of municipalities within each city-council size bin. These population thresholds remained in effect till 2009, when the Congress amended the constitution, creating new thresholds for council size as well as salary and legislative budgets within the municipalities. Resolution 21,702/2004 allows us to uniquely identify the effect of clientelistic supply on citizen welfare. As the Superior Electoral Tribunal established the municipality's thresholds without any strategic consideration, we can use the municipalities arbitrarily close to the population thresholds as a quasi-experimental variation in legislature size and, consequently, in clientelism. The period of this study is between 2005 and 2008, which comprises a full mayoral and city-council term in the Brazilian municipalities following the 2004 elections.

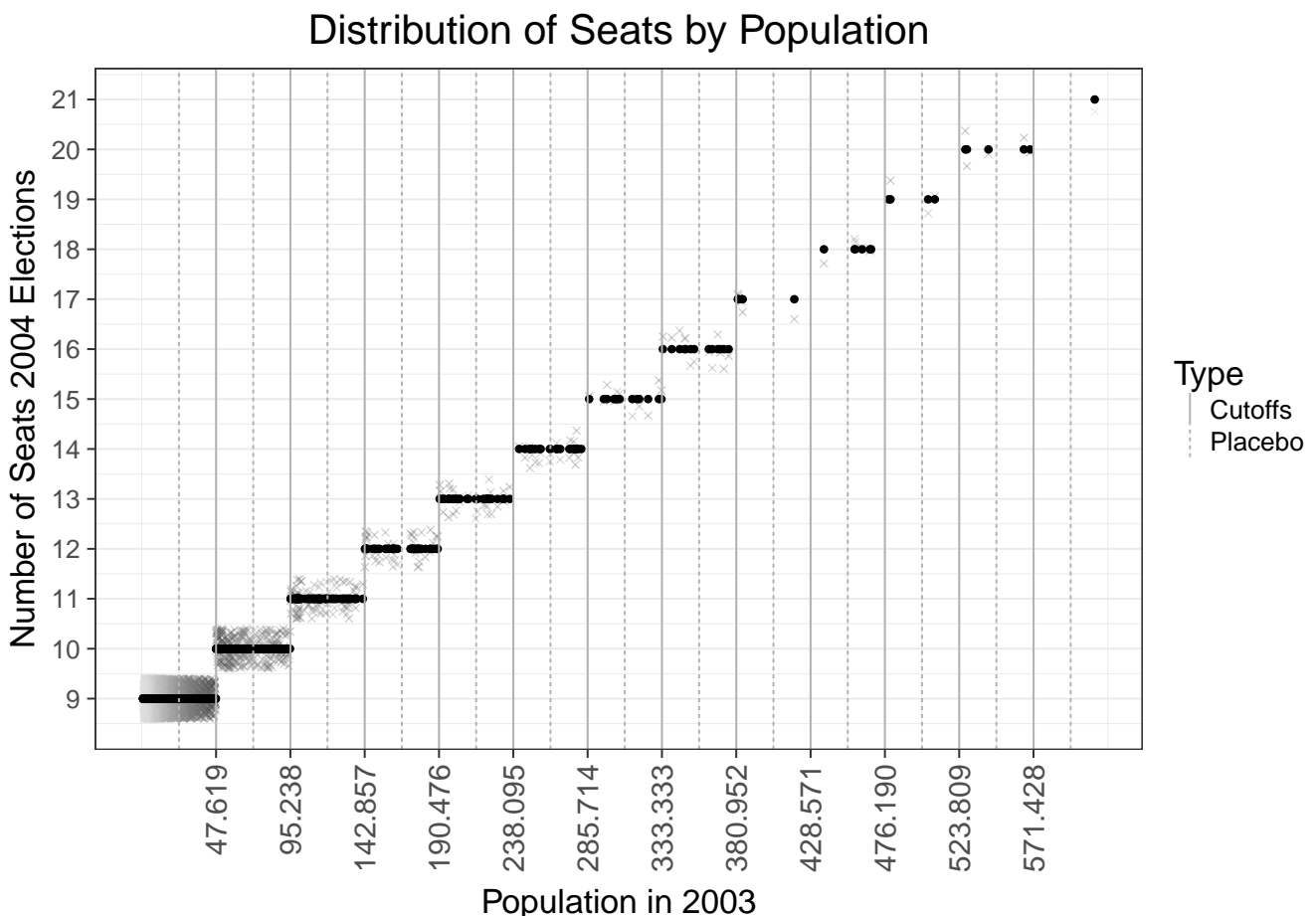


Figure 1: *Distribution of Municipalities by Population and City-Council Size*

The main problem with our identification strategy is that regression discontinuity de-

sign works well when there is only one threshold, but it may lead to inconsistent estimates when we have multiple thresholds (Bertanha 2015; Cattaneo et al. 2016). For example, in our dataset, we have twelve discontinuities, and at each threshold, we have a sharp increase of one councilor, from 9 to 21. When running an RDD on these discontinuities, a consistent estimator should fit an exact change of one councilor. However, if we pool all the discontinuities and run an RDD ignoring the multiplicity of cutoffs, the estimator finds that the increase in council size is of 1.63 councilors, as Column (1) on Table 3 below shows us. The key problem here is that when we pool all the discontinuities together, we are implying that municipalities right below the 47,619 cutoff (9 to 10 councilors) are comparable to municipalities right above the 571,428 cutoff (20 to 21 councilmen). That is not only untrue because we would be comparing a municipality with nine councilors with one with 21 councilors. These municipalities are also diverse in many other aspects, from population to GDP per capita.

To avoid this problem, we show by simulation that adding controls, especially the variables responsible for the multiple threshold assignment (in our case, population in 2003), improves not only consistency but also efficiency.¹⁷ Relying on this fact, we add five controls to our estimates: population in 2003, GDP per capita, number of seats in 2000, year, and a dummy for the northeast. The reason for the first variable is the multiple threshold assignment. We add GDP per capita because larger municipalities tend to be richer and have better public services for reasons unrelated to clientelism.¹⁸ The number of seats in 2000 intends to control for the fact that some municipalities could experience a change provoked by the previous council size, confounding our estimates. The year and the northeast dummy are meant to improve efficiency.¹⁹ Note that, in single threshold RDD, it is uncommon to use controls, as we assume that pre-treatment variables should be constant before treatment. However, adding controls improves efficiency in multiple thresholds RDD. In addition, there are no changes in these variables when we take each cutoff individually, but

¹⁷We put a detailed explanation of our research design, along with all the simulations run to perfect the estimation equations, in the Online Supplemental materials.

¹⁸Moreover, Weitz-Shapiro (2009) shows that clientelism strongly correlates with poverty levels.

¹⁹In the Appendix A.2, we carry out a sensitivity test where we run all regressions for each combination of the controls proposed here. Nonetheless, our choice of controls tends to be on average the most conservative model, with the lowest point-estimate effect.

the estimates improve when we pool them together, making them a perfect control for our research design (Calonico et al. 2016).

Moreover, to further the credibility of our causal claims, we propose a placebo test consisting of running the same models but with fake cutoffs. We build the fake cutoffs by creating a cutoff between each pair of real cutoffs. We run placebo tests for all variables studied in this paper. For all placebo models, we consistently find null results, as expected.

In addition, the credibility of the causal claim relies on three main assumptions. Firstly, we need to show that no municipality could choose on which side of the discontinuity it would lie. Secondly, we need to demonstrate that, in the first stage, the number of city councilors increases similarly to what the law mandates. As we have a sharp discontinuity, changes in the cutoffs have to be the same as the changes in the legislation. Finally, we need to show that variables collected before the 2003 Supreme Court decision do not change significantly.

For the first assumption, McCrary (2008) proposes a test of distributional imbalance around the cutoffs when we pool all the cutoffs. The test consists in measure the frequency of cases around the cutoff. If this frequency is larger in the left or in the right of the cutoff, then there is evidence of manipulation. The test reports a McCrary statistic of 0.391 with a 0.299 standard error, showing no evidence of manipulation.²⁰

The second and third tests follow in Table 3. At the top of the table, we run the first-stage regressions, both using and not using the controlling covariates, for both the cutoffs and the placebo cutoffs. At the bottom, we run the main model for the 2000 census pre-treatment variables.

Notice that without controls, the first stage overestimates the change in the main treatment and underestimates the change in the placebo regressions. After adding covariates, the results improve and the point estimates are now one for the main model and zero for the placebo regressions, which are the precise values. As discussed above, the control variables improve the quality of our estimates.

For the pre-treatment variables, we have no expectation that the number of seats, pop-

²⁰The McCrary test graph, and the newest Cattaneo et al. (2016) manipulation tests can be found in the Online Supplemental Materials.

Table 3: Research Design Validity Check

| | Validity Check — First Stage | | | |
|-------------|---|---|--|--|
| | (1) | (2) | (3) | (4) |
| | Additional Num. Seats 2004 (Without Controls) | Placebo Add. Num. Seats 2004 (Without Controls) | Additional Num. Seats 2004 (With Controls) | Placebo Add. Num. Seats 2004 (With Controls) |
| LATE | 1.63*** (0.51) | -0.31** (0.14) | 1.00*** (0.0004) | -0.00 (0.0000) |
| N Left | 5184 | 4621 | 5173 | 4611 |
| N Right | 343 | 906 | 343 | 905 |
| Eff N Left | 199 | 638 | 49 | 884 |
| Eff N Right | 145 | 385 | 51 | 476 |
| BW Loc Poly | 8.717 | 6.7 | 3.008 | 8.62 |
| BW Bias | 13.62 | 12.114 | 5.008 | 13.457 |
| | Validity Check — Pre-Treatment Variables | | | |
| | (5) | (6) | (7) | (8) |
| | Number of Seats 2000 | Population 2000 Census | GDP 2000 Census | Prop. Poverty 2000 Census |
| LATE | 0.17 (0.67) | -2057.63 (1926.39) | 0.06 (0.18) | -9.72 (6.27) |
| N Left | 5178 | 5131 | 5131 | 5131 |
| N Right | 343 | 343 | 343 | 343 |
| Eff N Left | 208 | 219 | 200 | 194 |
| Eff N Right | 147 | 157 | 145 | 142 |
| BW Loc Poly | 8.97 | 9.368 | 8.738 | 8.529 |
| BW Bias | 13.86 | 15.029 | 14.752 | 13.035 |

Note: *** $p < .01$; ** $p < .05$; * $p < .1$. RD local linear estimates using [Calonico et al. \(2014\)](#) optimal bandwidth quadratic selection and triangular kernel. Robust standard errors, clustered at the municipal level, in parenthesis. Controls: population, GDP per capita, number of seats in 2000, year, and dummy for northeast region. *N Left* means the number of observation in the left side of the thresholds (untreated). *N Right* represents the number of observations in the right side of the thresholds (treated). *Eff N Left* and *Eff N Right* are the number of cases the estimation technique indeed uses. *BW Loc Poly* is the Bandwidth used to compute the LATE (Local Average Treatment Effect). *BW Bias* is the Bandwidth used to compute the robust standard error reported in parenthesis.

ulation, GDP, and poverty rate in 2000 vary with a 2003 decision. Models (5) to (8), at the bottom of Table 3, show that these regressions are insignificant, reinforcing the validity of our research designs.

4 Legislature Size and Welfare: Clientelist Captured Public Services Provision

In this section, we show that an increase in the number of city councilors influences the provision of certain public services. We show that there are improvements in health care and education. Nevertheless, the clientelistic motivation explains most of the incentives that legislators face to provide public services. This is demonstrated by dividing the health care and education outcomes into two groups.

The first group comprises services that clientelistic machines can capture. Councilors can either distribute these services themselves or facilitate the distribution by using their clientelistic networks. Moreover, these types of services result in more votes, as they have an intense advertising effect over the electorate. In this category, we have general health care and school enrollment. The last types of services are not easily captured by the clientelistic machines. These services do not revert into votes easily and/or are not easier to target and advertise. In our models, we use preventive health care and quality of education as examples of such services.

If the clientelistic logic prevails, we should expect that an extra legislator increases only the clientelistic captured services. Whereas, if the clientelistic argument is incorrect, some of the non-clientelistic services should also improve. Table 4 presents the results for the health care and education outcomes.

The results on health care provision are substantive. First, an extra legislator lowers the infant mortality to 1.98 deaths per 1,000 children born. This impact is large, but in terms of standard deviations, this represents an effect of 0.14, which is within reason. Second, it decreases the post-natal death rate by 0.90 casualties per 1,000 children born. This represents also around 0.14 standard deviation of improvement in these health care outcomes. How-

Table 4: Public Service Outcomes

| Health Care Outcomes | | | | Education Outcomes | | | |
|--|-----------------------|----------------------------|-----------------------------------|--------------------------------------|---------------------|----------------------------|-----------------------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Infant Mortality | Post-Natal Mort. Rate | Cov. Family Health Program | Pr. Born w. 6+ Pre-Natal Consult. | Average Enroll. K-4 | Average Enroll. 5-8 | Elem. School Quality Index | Middle School Quality Index |
| -1.98** (0.78) | -0.90* (0.48) | -1.57 (2.11) | -4.62 (4.07) | 2.58*** (0.81) | 0.04 (1.07) | -0.05 (0.13) | -0.11 (0.11) |
| N Left | 12267 | 19237 | 15515 | 10134 | 7284 | 8575 | 5018 |
| N Right | 1029 | 1296 | 1029 | 686 | 581 | 669 | 529 |
| Eff N Left | 516 | 293 | 582 | 196 | 469 | 377 | 279 |
| Eff N Right | 390 | 242 | 435 | 202 | 312 | 283 | 195 |
| BW Loc Poly | 7.745 | 4.401 | 8.597 | 5.172 | 11.169 | 8.643 | 7.781 |
| BW Bias | 12.326 | 7.711 | 14.67 | 10.596 | 16.661 | 15.110 | 13.674 |
| Health Care Outcomes – Placebo Cutoffs | | | | Education Outcomes – Placebo Cutoffs | | | |
| (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| Infant Mortality | Post-Natal Mort. Rate | Cov. Family Health Program | Pr. Born w. 6+ Pre-Natal Consult. | Average Enroll. K-4 | Average Enroll. 5-8 | Elem. School Quality Index | Middle School Quality Index |
| -1.10 (1.06) | -0.25 (0.65) | 1.32 (1.28) | -2.30 (2.92) | 0.47 (0.61) | 0.96 (0.98) | -0.10 (0.11) | -0.13 (0.09) |
| N Left | 10584 | 17158 | 13830 | 9020 | 6330 | 7508 | 4226 |
| N Right | 2712 | 3375 | 2714 | 1800 | 1535 | 1736 | 1321 |
| Eff N Left | 1162 | 2563 | 1587 | 1172 | 1126 | 1212 | 917 |
| Eff N Right | 860 | 1483 | 1004 | 714 | 670 | 734 | 578 |
| BW Loc Poly | 4.688 | 6.99 | 5.82 | 6.275 | 6.953 | 6.703 | 7.109 |
| BW Bias | 7.145 | 11.285 | 9.588 | 9.77 | 12.527 | 10.041 | 10.804 |

Note: ***p < .01; **p < .05; *p < .1. RD local linear estimates using Calonico et al. (2014) optimal bandwidth quadratic selection and triangular kernel. Robust standard errors, clustered at the municipal level, in parenthesis. Controls: population, GDP per capita, number of seats in 2000, year, and dummy for northeast region. *N Left* means the number of observation in the left side of the thresholds (untreated). *N Right* represents the number of observations in the right side of the thresholds (treated). *Eff N Left* and *Eff N Right* are the number of cases the estimation technique indeed uses. *BW Loc Poly* is the Bandwidth used to compute the LATE (Local Average Treatment Effect). *BW Bias* is the Bandwidth used to compute the robust standard error reported in parenthesis.

ever, neither the coverage in the Brazilian Family Health Program, nor the Proportion of Newborns that had more than six prenatal consultations change significantly, and even the sign of change would be inconsistent with welfare improvements. As expected, the placebo tests were not significant.

In our view, infant mortality and post-neonatal infant mortality are sensitive in terms of the clientelistic rewards they can provide for the councilor. Decreased infant mortality, especially with hospitalization and distribution of medication, is considerably easier for councilors to capture and use in *quid pro quo* arrangements. Getting a bed in a hospital for an infant not only is good for advertising, but also may have an intense emotional impact on voters, triggering a reciprocity behavior (Finan and Schechter 2012).

Conversely, the Family Health Program and improved prenatal care are great services to prevent future diseases; however, they do not help councilors in terms of the latter's self-promotion. Preventive health care focuses on a lower future expectation of getting sick. If voters do not perceive these chances as real possibilities, they are unlikely to reward politicians that focus on providing those services. From the council-member perspective, these services do not provide the expected return in votes that would payout the costs to improve their provision.

The results for education, are similar to what we found for health care. First, enrollment in elementary schools increases by 2.58 children on average per school. This represents a change of around 0.20 standard deviations. The remaining educational outcomes are not significant. For middle-school enrollment, the reason is that the law mandates that once enrolled, the schools have to guarantee future placement at the same school. For parents, the only time to request a school placement is at the beginning of the school training. For the quality indicators, the results are insignificant, showing that we have no expected change in school quality with larger city councils. As expected, the placebo regressions are also insignificant.

Helping a child with placement at a public school is relatively cheap for a politician. The classroom is there and what the politician should do is pressure the school's bureaucracy to accommodate a few extra children. This can be done at virtually no cost, and the benefit

of the exchange is evident. Quality of education is great for advertising, but it takes years of work and considerable resources to produce positive results. This makes investments in education quality less attractive from a city councilor's perspective.

Hence, there are considerable improvements in service provision. Along with other services, most scholars agree that improvements in infant mortality and school enrollment are positive welfare achievements. In Brazil, more city councilors ameliorate the provision of education and health care services. However, the improvements are skewed toward services that agree with the councilor's interests. When councilors can use the services to get more votes, the services improve. Otherwise, the councilors do not invest time trying to ameliorate the services.

In any case, our results on health care and education by themselves do not allow us to conclude that an increase in clientelistic supply is the main cause of these welfare improvements. First, it is unrealistic to think that all politicians have free access and can target these services at their will. Mayors and bureaucrats mediate most of the access to these services and they may filter the councilor's demands in ways that could lower clientelism. Second, councilors may not perceive the provision of these services as electorally attractive. It is difficult to trace these *quid pro quo* exchanges, and a competing explanation could pose that hospitals are being better monitored by councilors, or even that councilors are proposing better laws, for example, mandating school bureaucrats to accommodate the demand for new placements. Finally, reciprocity would have to play a considerable role in these exchanges, as nothing ensures that voters will comply with their promises. Brazilian elections are regarded as relatively free and clean, and the ballot is secret, increasing considerably the chances of defection from the clientelistic agreement.

To precisely characterize the mechanism, we need to show that three characteristics hold. First, we have to present evidence that city councilors have access to public services, which they could use to target their constituencies. Second, clientelistic exchanges carry out a considerable commitment problem. In this sense, councilors should take steps to tie their constituencies, or at least their brokers, with their success in office. Finally, councilors have to find clientelistic services electorally attractive, vis-à-vis their other duties, such as de-

veloping legislation and overseeing bureaucracy. The next section discusses a micro-level mechanism, tying larger council sizes with clientelistic supply.

5 From Council Size to Clientelism: Mechanism

In this section, we present two sets of evidence showing that the supply of clientelism increases with the legislature size in Brazil. First, we investigate a few municipal level outcomes that would indicate whether clientelism supply is increasing with legislature size. Then, we analyze an online survey conducted with 173 former city councilors during the 2005–2008 period, aiming at providing micro-level indications that our mechanism holds. Table 5 presents the results for the first evidence set.

Table 5: *Mechanism Regressions — Clientelistic Connection*

| | Clientelistic Mechanism | | | |
|-------------|---------------------------|-------------------------------------|----------------------------|------------------------------|
| | (1) | (2) | (3) | (4) |
| | Mayoral Coalition Size | Num. Politically Appointed Empl. | Num. Career Bureaucrats | Num. Councilor Assistants |
| LATE | 0.91* | 105.03* | 71.61 | 2.09 |
| | (0.50) | (62.07) | (218.07) | (4.37) |
| N Left | 5168 | 15504 | 15499 | 5173 |
| N Right | 343 | 1028 | 1027 | 344 |
| Eff N Left | 239 | 354 | 513 | 99 |
| Eff N Right | 161 | 337 | 388 | 101 |
| BW Loc Poly | 9.9 | 6.04 | 7.702 | 5.134 |
| BW Bias | 15.849 | 10.175 | 11.786 | 8.902 |

Note: ***p < .01; **p < .05; *p < .1. RD local linear estimates using [Calonico et al. \(2014\)](#) optimal bandwidth quadratic selection and triangular kernel. Robust standard errors, clustered at the municipal level, in parenthesis. Controls: population, GDP per capita, number of seats in 2000, year, and dummy for northeast region. *N Left* means the number of observation in the left side of the thresholds (untreated). *N Right* represents the number of observations in the right side of the thresholds (treated). *Eff N Left* and *Eff N Right* are the number of cases the estimation technique indeed uses. *BW Loc Poly* is the Bandwidth used to compute the LATE (Local Average Treatment Effect). *BW Bias* is the Bandwidth used to compute the robust standard error reported in parenthesis.

First, councilors need to have access to resources in order to perform clientelistic exchanges. In a Brazilian municipality, mayors control the provision of health care and education by funding and staffing hospitals and schools. Consequently, councilors need ties with the mayor to access these services. In Brazil, these ties with mayors start in the pre-electoral

coalition period, around a year before the election.²¹ Belonging to the mayoral pre-electoral coalition is a great indicator of ties with the mayor and, therefore, access to resources after the election. Column (1) in Table 5 shows exactly this. In our study, the extra legislator has a 91% chance of belonging to the mayoral coalition. Considering that the extra legislator is allied with the mayor, we know that she has more access to resources and can use them to target her supporters.

Second, the clientelistic exchange carries out a considerable commitment problem, especially in Brazil, where elections are considered clean and the ballot is secret. How do councilors guarantee that clientelistic voters keep voting for a given candidate in a situation in which the electoral outcomes are highly volatile?²² Patronage, defined as employment of public servants in exchange of political support, is an efficient way to overcome these problems (Robinson and Verdier 2013): politically appointed public jobs are a strong strategy, as it comes with the threat that if the councilor loses the election, the person will be fired.²³ It also helps councilors reward their electoral brokers, tying these brokers to the future councilor's elections. Column (2) in Table 5 shows that adding one councilor implies an increase of over one hundred appointed jobs in the municipality. This represents over 0.30 standard deviations.²⁴

Finally, as the number of politicians in the mayoral coalition increases, our results could be due to the extra councilor making it easy for the mayor to implement policies. In this case,

²¹Because councilors in Brazil are elected by a Proportional Representation system, the Electoral Justice allocates seats for parties and coalitions according to their vote shares. The Electoral Justice pools the votes together and allocates seats according to the vote shares, correcting the rounding seats using highest remainders. After distributing the seats, the electoral justice declares the candidates with the most votes within each party and/or coalition as the winners. In order to get at least one seat, parties have to overcome the electoral quota, therefore having incentives to join pre-electoral coalitions. Moreover, the Brazilian system is a mix of the Hare Quota and the D'Hondt method, which usually favors the most voted coalitions.

²²Novaes (2015); Klačnja and Titiunik (2016) have already asked similar questions.

²³In Brazil there are three job statuses for public service. The first is called *estatutário*, which is the job filled by public selection, and from which the approved candidates cannot be fired. The second, called *celetista*, is also filled by public selection, but it is more flexible in its firing policy, similar to a firm job. The last, called *comissionado*, represents jobs, appointed by the mayor, which can be terminated at any time. Politically appointed jobs account for about 30% of jobs in Brazilian municipalities, but this varies considerably throughout the country.

²⁴This result is key for our argument: these employees are essential to implementing clientelistic policies for the councilors. They are also the main connection between the bureaucracy and the city council. In Brazil, every councilor can appoint a few assistants after the election. However, as Column (4) of Table 5 shows, this number is small, showing that councilors are appointing bureaucrats in the Executive branch. Therefore, we show that clientelistic policies are present in the relation between voters and politicians, and also in the relation between politicians and the bureaucracy.

we would be capturing an increase in state capacity investments. To rule out this possibility, we consider the number of career employees in the municipality. If this increases, then the municipality is investing in improving its bureaucracy, which could be understood as a programmatic improvement.²⁵ Additionally, we study whether the number of employees in the councilor's cabinet increases with the addition of one extra councilor. This could potentially lower the importance of our number of appointed employees result. Columns (3) and (4) of Table 5 show that both alternatives are not statistically significant.²⁶

Nevertheless, the reader may raise two points against our arguments. First, that improvement in representation could be causing changes in health care and education. For instance, [Corrêa \(2014\)](#) argues that more female legislators caused improvements in infant mortality, and [Pande \(2003\)](#) shows that more representation of political minorities has a positive effect on welfare. More councilors from specific groups could shift public-service provisions toward these groups. To test this claim, we ran the regressions on the proportion of female councilors elected and of non-white councilors elected. The results are in the Appendix A.1; they show no differences in representation results from the increasing legislature size.

The second point is that all our results so far are aggregated at the municipal level. All we showed is that more legislators improve some education and health care outcomes and that municipalities with larger city councils have more councilors supporting the mayor and more patronage. We measure all these indicators at the municipal level, pooling the disaggregated ones to represent a municipal average. However, we need at least some indication that clientelism operates among the city councilors in their daily representation practice. To show this, we conducted an online survey with 174 former city councilors who served between 2005 and 2008. We asked former councilors two questions.²⁷ First, what public

²⁵Career bureaucrats have to undergo a rigorous public selection, securing the job and, afterward, avoiding getting fired for political reasons. These jobs pay considerably better than comparable positions in the private sector and have better pension schemes than the private sector.

²⁶For all the models above, we also estimated the placebo regressions, finding that outside the cutoffs, these models are insignificant. The results are in section B.10 of the Online Supplemental Materials.

²⁷Besides this survey, the literature on clientelism in Brazil provides the evidence needed to conclude that the micro-level mechanism is indeed clientelism ([Leal 1975](#); [Ames 2001](#); [Castro et al. 2009](#); [Nichter 2011](#); [Braga et al. 2013](#); [Boas et al. 2014](#); [Hidalgo and Nichter 2016](#); [Novaes 2015](#)). We also studied 108 structured interviews conducted by Almeida and Felix at the Brazilian Economics Planning Institute (IPEA) in 2009, and these interviews reinforce that the main duty of a Brazilian councilor is to provide clientelistic services ([Lopez and](#)

services give more votes to a councilor, providing a list of clientelistic, oversight, and law-making services. Second, we asked them to indicate the number of legislators that were known for providing clientelistic, oversight, and legislation services in the municipality.²⁸ Figure 2 presents the electoral attractiveness of different services.

Figure 2: Electoral Attractiveness of Councilor's Jobs

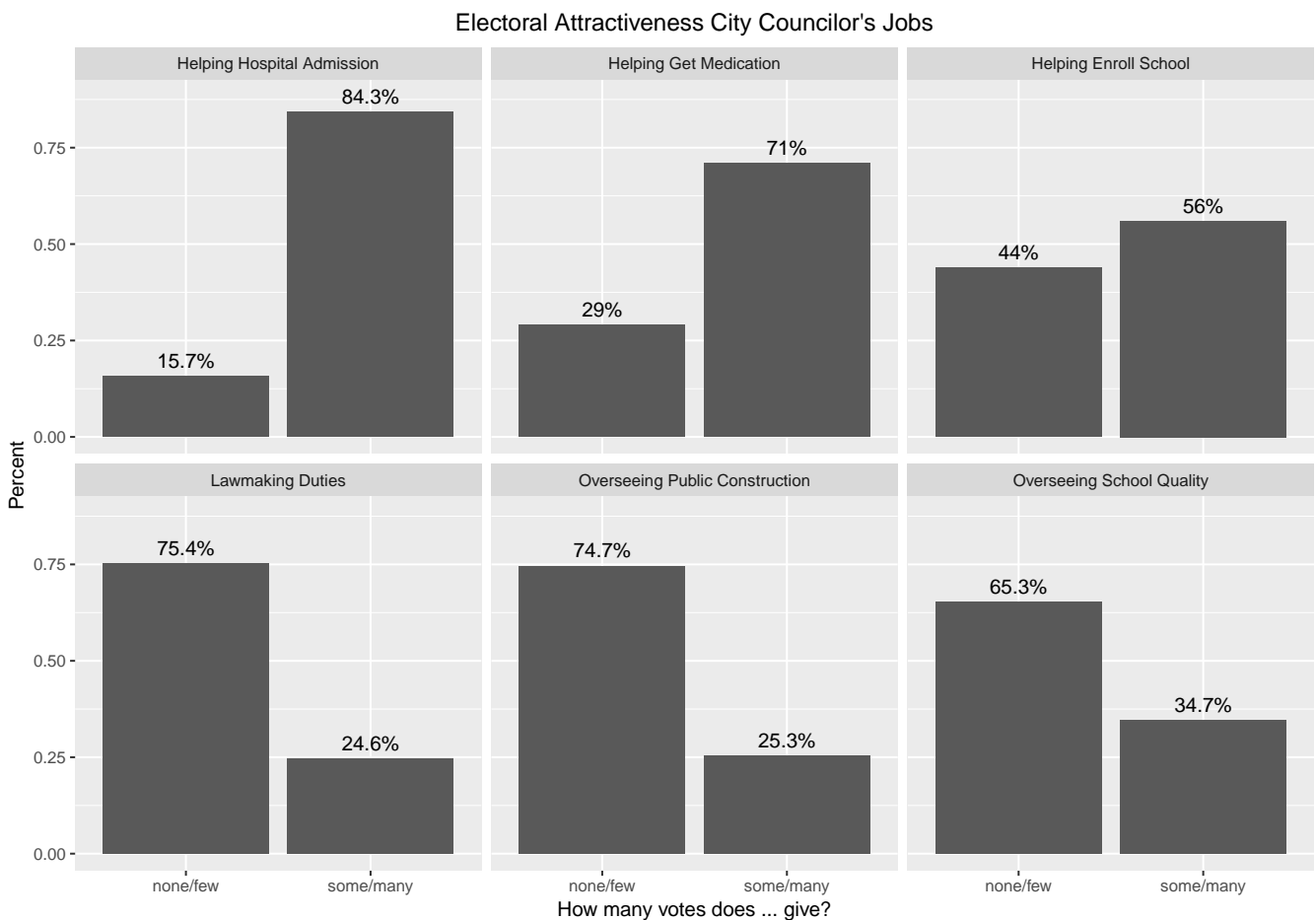


Figure 2 shows that former councilors perceive the clientelistic jobs as more electorally

Almeida 2012).

²⁸We question legislators about two aspects of their duties. Firstly, what types of services give them the most votes, offering six types of services: i) helping voters access public hospitals; ii) helping voters get medication; iii) helping voters enroll their kids in public schools; iv) helping voters by discussing and approving legislation; v) helping voters by overseeing public construction projects; and vi) helping voters by overseeing the quality of school teaching. Secondly, we ask legislators to provide the number of people that served with them (themselves included) that used to perform the following three tasks. First, help voters with personal favors, such as medication, hospital access, school enrollment, and so on. Second, helping voters by proposing and putting forward legislation, and finally, helping voters by overseeing the bureaucracy. Then we asked how many councilors served with them. If the numbers provided in the previous questions were above the number of councilors, we excluded the answer. We excluded one answer only. For a more detailed description of the survey, see the Online Supplemental Information.

attractive than legislating or oversight. When asked what types of services give more votes, 84.3% indicated getting a voter a hospital bed; 71.0% indicated getting a voter medication; and 56.0% reported helping with school enrollment as the services that secure some or more votes. Asked about the electoral attractiveness of lawmaking and oversight services, 24.6% of voters answered discussing and implementing legislation; 25.3% reported overseeing a public construction project; and 34.7% overseeing the quality of teaching at a public school, secure more or some votes. This is not by itself an indication that clientelistic exchanges happened, but as demonstrated by [Szwarcberg \(2013\)](#), we need to provide a reason to explain why councilors would want to pursue clientelistic strategies.

Finally, we asked councilors to report how many council members in their municipality used to engage in clientelistic exchanges with voters, with legislating, and with bureaucracy oversight. Councilors reported that an average of 6.22 engaged in clientelistic exchanges, an average of 3.45 with lawmaking duties, and an average of 4.04 with bureaucratic oversight.²⁹ We perform both a paired and raw t-test to measure the differences in means in the number of legislators for each task. The pairs clientelistic and legislative, as well as clientelistic and oversight, showed a significant difference in the expected direction. Councilors answered that, on average, there were 2.77 (p-value < 0.001) more clientelistic legislators when compared with lawmaking legislators, and 2.17 (p-value < 0.001) more clientelistic than oversight legislators. If we compare lawmaking with oversight legislators, the difference is -0.59 (p-value = 0.02). Therefore, the surveyed council members reported that the clientelistic mechanism is indeed more pronounced than incentives for lawmaking and oversight.

In sum, the previous section shows there are significant improvements in health care and education. Nonetheless, it demonstrates that services prone to clientelism concentrate most of these improvements. This section takes three key steps that pin down this clientelistic mechanism. First, it shows that legislators have access to education and health care services. Second, it shows that councilors viewed clientelistic services as more electorally attractive. Finally, on average, more legislators agreed that the clientelistic exchange is considerably

²⁹We perform the same analysis on municipalities that are within 10,000 inhabitants from the city-council size thresholds. The results are the same as here, and can be checked in the Online Supplemental Materials.

more widespread than other representation methods. These three findings suggest that the legislature size has a considerable impact on clientelistic supply.

Conclusion

Changes in city-council size produce an upward shock in the supply of clientelism in Brazil. Increasing the clientelistic supply decreases infant mortality and increases educational enrollment. However, these changes are not accompanied by improvements in education quality and preventive health care. Moreover, more clientelism broadens the incentives for patronage and corruption, and skews the service provision toward public services that clientelistic machines can easily capture. In sum, while some services improve, others remain unchanged or even deteriorate.

This paper shows that the welfare implications of clientelism are convoluted. Specifically in the Brazilian case, according to the Brazilian Institute of Geography and Statistics, during the 1980s the primary school enrollment level was 81%, with students aged between seven and fourteen years, and infant mortality was nearly 64 children for every thousand born. By 2010, school enrollment was close to 99% and infant mortality dropped to 23.74 casualties per 1,000 infants born. These achievements are remarkable, especially if we consider they were achieved in two generations.

However, programmatic policies would focus on improving education and health care regardless of clientelistic considerations. In countries plagued by clientelism, this was not the case. In Brazil, for instance, diseases transmitted by the *Aedes Aegypti* mosquito (Chikungunya, Dengue, and Zika) have boomed in the past thirty years. Dengue fever, which was under control during the 1990s, becomes a major public health concern in the following decades.³⁰ The recent Zika epidemics have increased the incidence of microcephaly from an average of 157 cases per year during 2000 to 2014, to an average of 574 in 2015, according to the Brazilian Ministry of Health (de Oliveira 2016). Although it does not cause any disease itself, microcephaly is correlated with several neurological and cognitive problems. In terms of education quality, Brazil scored consistently below the OECD average in

³⁰<http://veja.abril.com.br/complemento/saude/evolucao-dengue/>

the OECD's *Programme for International Student Assessment* (PISA). Between 2006 and 2015, there were no improvements in reading and science scores, and only a mild improvement in math. In 2000, among the 32 countries that participated on the PISA test, Brazil ranked in the last position. In 2015, Brazil ranked 63rd among the 70 countries tested. Therefore, the achievements in infant mortality and education enrollment become less intense when we realize that hospital care could be avoided or that poor Brazilians are enrolling their children in substandard schools.

This paper provides an empirical picture of how clientelism harms welfare. When clientelism prevails, politicians prefer to improve services that can be traded for votes. Programmatic politics become less important, as clientelism represents the only equilibrium strategy for gathering votes. Countries achieved some improvements, but these were not sustained. Not surprisingly, most nations in Latin America, especially those democratized after the 1980s, are still struggling to consolidate their regimes. These nations present high levels of corruption, clientelism, and political violence, which impede politics from shifting toward a more inclusive and ideological type of representation, one that would foster solid enhancement of long-term economic and social welfare.

References

- Acemoglu, D., S. Naidu, P. Restrepo, and J. A. Robinson (2014). Democracy does cause growth. Technical report, National Bureau of Economic Research.
- Acemoglu, D. and J. Robinson (2012). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Business.
- Albertus, M. (2015). The role of subnational politicians in distributive politics: Political bias in venezuela's land reform under Chávez. *Comparative Political Studies* 48(13), 1667–1710.
- Ames, B. (1995). Electoral strategy under open-list proportional representation. *American Journal of Political Science* 39(2), pp. 406–433.
- Ames, B. (2001, August). *The Deadlock of Democracy in Brazil* (1 ed.). University of Michigan Press.
- Anderson, S., P. Francois, and A. Kotwal (2015). Clientelism in indian villages. *The American Economic Review* 105(6), 1780–1816.
- Banerjee, A. and E. Duflo (2012). *Poor economics: A radical rethinking of the way to fight global poverty*. PublicAffairs.
- Banerjee, A. V. (1997). A theory of misgovernance. *The Quarterly Journal of Economics* 112(4), 1289–1332.
- Bardhan, P. and D. Mookherjee (2012). Political clientelism and capture. IGC Working paper.
- Bertanha, M. (2015, Mar). Regression discontinuity design with many thresholds. Working Paper.
- Boas, T. C., F. D. Hidalgo, and N. P. Richardson (2014, 4). The spoils of victory: Campaign donations and government contracts in Brazil. *The Journal of Politics* 76(2), 415–429.
- Braga, S., M. A. Nicolas, and A. R. Becher (2013, June). Clientelismo, internet e voto: Personalismo e transferência de recursos nas campanhas online para vereador nas eleições de outubro de 2008 no Brasil. *Opiniao Publica* 19(1), 168–197.
- Braga, S., M. A. Nicolás, and A. R. Becher (2013). Clientelismo, internet e voto: personalismo e transferência de recursos nas campanhas online para vereador nas eleições de outubro de 2008 no Brasil. *Opinião Pública* 19(1), 168–197.
- Britto, D. G. C. d. and S. Fiorin (2016). Corruption and legislature size: Evidence from Brazil. SSRN working paper.
- Bueno, N. S. and G. Tuñón (2015). Graphical presentation of regression discontinuity results. Available at SSRN 2549841.
- Calonico, S., M. D. Cattaneo, M. H. Farrell, and R. Titiunik (2016). Regression discontinuity designs using covariates. Technical report, working paper, University of Michigan.
- Calonico, S., M. D. Cattaneo, and R. Titiunik (2014). Robust nonparametric confidence intervals for regression-discontinuity designs. *Econometrica* 82(6), 2295–2326.
- Castro, M., F. Anastasia, and F. Nunes (2009). Determinantes do comportamento particularista de legisladores estaduais brasileiros. *Dados* 52(4), 961–1001.
- Cattaneo, M. D., M. Jansson, and X. Ma (2016). Simple local regression distribution estimators with an application to manipulation testing. Technical report, University of Michigan Working Paper, Retrieved from http://www-personal.umich.edu/~cattaneo/papers/Cattaneo-Jansson-Ma_2016_LocPolDensity.pdf [Date Accessed: 11/29/2016].
- Cattaneo, M. D., R. Titiunik, G. Vazquez-Bare, and L. Keele (2016). Interpreting regression discontinuity designs with multiple cutoffs. *The Journal of Politics* 78(3), 1229–1248.

- Corbi, R. and E. Papaioannou (2014). Size of legislature, public spending and political budget cycle. Working Paper.
- Corrêa, G. B. (2014). *The size of local legislatures and women's political representation: evidence from Brazil*. Ph. D. thesis, Universidade de São Paulo.
- de Oliveira, W. K. (2016). Increase in reported prevalence of microcephaly in infants born to women living in areas with confirmed zika virus transmission during the first trimester of pregnancy brazil, 2015. *MMWR. Morbidity and mortality weekly report* 65, 00–00.
- Duncan, L. E. (2005). Personal political salience as a self-schema: Consequences for political information processing. *Political Psychology* 26(6), 965–976.
- Finan, F. and L. Schechter (2012). Vote-buying and reciprocity. *Econometrica* 80(2), 863–881.
- Gelman, A. and G. Imbens (2014). Why high-order polynomials should not be used in regression discontinuity designs. NBER Working Paper.
- Hicken, A. (2011). Clientelism. *Annual Review of Political Science* 14, 289–310.
- Hidalgo, F. D. and S. Nichter (2016). Voter buying: Shaping the electorate through clientelism. *American Journal of Political Science* 60(2), 436–455.
- IPEA (2012). Base de dados vereadores de minas gerais. INSTITUTO DE PESQUISA ECONÔMICA APLICADA.
- Keefer, P. and R. Vlaicu (2008). Democracy, credibility, and clientelism. *Journal of Law, Economics, and Organization* 24(2), 371–406.
- Khemani, S. (2015). Buying votes versus supplying public services: Political incentives to under-invest in pro-poor policies. *Journal of Development Economics* 117, 84–93.
- Klašnja, M. and R. Titiunik (2016). The incumbency curse: Weak parties, term limits, and unfulfilled accountability. Technical report, Working paper.
- Kramon, E. (2016). Where is vote buying effective? evidence from a list experiment in kenya. *Electoral Studies* 44, 397–408.
- Kramon, E. and D. N. Posner (2013). Who benefits from distributive politics? how the outcome one studies affects the answer one gets. *Perspectives on Politics* 11(02), 461–474.
- Kuschnir, K. (2000). *O cotidiano da política*. Zahar.
- Larreguy, H., J. Marshall, and P. Querubin (2016). Parties, brokers and voter mobilization: How turnout buying depends upon the party's capacity to monitor brokers. *American Political Science Review* 110(1), 160–179.
- Larreguy, H. A. (2013). Monitoring political brokers: Evidence from clientelistic networks in mexico. Working paper.
- Lawson, C. and K. F. Greene (2014). Making clientelism work: How norms of reciprocity increase voter compliance. *Comparative Politics* 47(1), 61–85.
- Leal, V. N. (1975). *Coronelismo, enxada e voto: o município eo regime representativo no Brasil*. Editora Alfa-Omega.
- Lopez, F. and A. Almeida (2012). Legisladores, captadores e assistencialistas: A representação política no nível local. IPEA Working Paper - Forthcoming at Revista de Sociologia e Política.
- McCrary, J. (2008, Feb.). Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of Econometrics* 142(2), 698–714.
- Nazareno, M., V. Brusco, T. Dunning, and S. Stokes (2008). Why do clientelist parties target the poor? Technical report, Yale University mimeo.

- Nichter, S. (2011). Electoral clientelism or relational clientelism? healthcare and sterilization in brazil. SSRN Working Paper.
- Nichter, S. (2014). Conceptualizing vote buying. *Electoral Studies* 35, 315–327.
- Novaes, L. M. (2015). Disloyal political brokers and the problem of clientelistic party building. EBAPE - FGV working paper.
- Pande, R. (2003). Can mandated political representation increase policy influence for disadvantaged minorities? theory and evidence from india. *The American Economic Review* 93(4), 1132–1151.
- Pase, H. L., M. Müller, and J. A. de Morais (2014). O clientelismo nos pequenos municípios brasileiros. *Pensamento plural* 5(10), 181–199.
- Robinson, J. A. and T. Verdier (2013). The political economy of clientelism. *The Scandinavian Journal of Economics* 115(2), 260–291.
- Scott, J. C. (1972). Patron-client politics and political change in southeast asia. *American Political Science Review* 66(01), 91–113.
- Stokes, S. (2005). A formal model of machine politics with evidence from argentina. *American Political Science Review* 99(5), 315–325.
- Stokes, S., T. Dunning, M. Nazareno, and V. Brusco (2013). *Brokers, Voters, and Clientelism*. Cambridge Studies in Comparative Politics. Cambridge University Press.
- Szwarcberg, M. (2013). The microfoundations of political clientelism: Lessons from the argentine case. *Latin American Research Review* 48(2), 32–54.
- Vicente, P. C. and L. Wantchekon (2009). Clientelism and vote buying: lessons from field experiments in african elections. *Oxford Review of Economic Policy* 25(2), 292–305.
- Vieira, A. C. (2015). Clientelismo e serviços de saúde. *Revista Políticas Públicas* 6(1), 9–40.
- Weitz-Shapiro, R. (2009). Choosing clientelism: political competition, poverty, and social welfare policy in argentina. SSRN working paper.

A Appendix (this appendix is supposed to be with the main paper)

A.1 Alternative Mechanism Results

Increasing one legislator while keeping the population almost constant, usually lowers the voting threshold that an individual legislator needs to get elected. This has obvious implications, such as making it easier for politically marginalized groups to contest seats in an election. Moreover, it may attract considerable competition for the extra seat, as seats require less votes to be contested. In Table 6 we have the results for these alternative mechanisms.

Table 6: *Mechanism Regressions — Alternative Explanations*

| | Alternative Mechanisms | | | |
|--|------------------------|---------------------------|-------------------------------|-----------------------------|
| | Representation | | Elections & Leg. Productivity | |
| | Num. Female Councilors | Num. Non-white Councilors | Candidates Per Seat | Prop. Laws Approved Council |
| LATE | 0.22 (0.38) | 0.59 (0.85) | -0.19 (1.11) | -0.02 (0.08) |
| ----- | | | | |
| N Left | 5172 | 238 | 5173 | 3422 |
| N Right | 343 | 158 | 343 | 270 |
| Eff N Left | 194 | 46 | 179 | 227 |
| Eff N Right | 145 | 47 | 132 | 142 |
| BW Loc Poly | 8.574 | 2.91 | 8.132 | 11.081 |
| BW Bias | 13.573 | 4.842 | 12.054 | 16.922 |
| Alternative Mechanisms — Placebo Cutoffs | | | | |
| | Representation | | Elections & Leg. Productivity | |
| | Num. Female Councilors | Num. Non-white Councilors | Candidates Per Seat | Prop. Laws Approved Council |
| | LATE | 0.65** (0.27) | | -0.71 (0.48) |
| ----- | | | | |
| N Left | 4610 | | 4611 | 2989 |
| N Right | 905 | | 905 | 703 |
| Eff N Left | 413 | | 557 | 355 |
| Eff N Right | 297 | | 344 | 229 |
| BW Loc Poly | 4.873 | | 6.054 | 5.584 |
| BW Bias | 8.793 | | 10.251 | 8.898 |

Note: *** $p < .01$; ** $p < .05$; * $p < .1$. RD local linear estimates using [Calonico et al. \(2014\)](#) optimal bandwidth quadratic selection and triangular kernel. Robust standard errors, clustered at the municipal level, in parenthesis. Controls: population, GDP per capita, number of seats in 2000, year, and dummy for northeast region.

Column (1) of Table 6 shows that no differences in female representations were detected

in our regressions. Column (2) shows results for racial profiles of city councilors based on data collected by the authors for the municipalities that are around 10,000 inhabitants away from the cutoffs. The results show no significant change in the proportion of non-white legislators. Column (3) shows that there are no increases in the competition by seats, and Column (4) shows no differences in the proportion of laws approved as a function of the number of laws presented by the city council. This demonstrates that no differences in representation, electoral competition, and productivity follows from our analysis.

A.2 Sensitivity tests

We present here the sensitivity to the bandwidth selection, implementing the suggestions of [Bueno and Tuñón \(2015\)](#). [Figure 3](#) shows the robustness to bandwidth selection, varying from 50% to 200% of the [Calonico et al. \(2014\)](#) optimal bandwidth. We also ran other sensitivity tests for all the outcomes and the placebo regressions in the paper.

[Figure 3](#) shows that our results are robust to the bandwidth choice. As expected, the point estimates remain at a consistent range in the entire interval and close to the optimal bandwidth coefficient. Therefore, our results are quite robust to the bandwidth selection method.

We ran four other sensitivity tests, which can be found in the Online Supplemental Materials. First, we check for the sensitivity to polynomial order, showing that the results are mostly robust ([Online Supplemental Section B.8](#)). In any case, high-order polynomials are not recommended in RD analyses ([Gelman and Imbens 2014](#)). Second, as the literature regards some Brazilian states as more clientelistic than others, we estimate all models dropping one state at a time to check whether some states could be driving our results. We find no significant state effects ([Online Supplemental Section B.7](#)). Third, we run the same analysis including one cutoff at a time to investigate the sensitivity to the number of cutoffs used in the main model ([Online Supplemental Section B.11](#)). This also helps us capture an eventual diminishing returns effect. We disprove both possibilities, as the point estimates remain practically in the same range as the model with all cutoffs. Finally, in a model with multiple thresholds, the choice of covariate can change the consistency of our estimates. To show that our results are robust to our covariate choice, we estimate the models adding one covariate at a time ([Online Supplemental Section B.9](#)).³¹

³¹We ran all these models for the placebo cutoffs without any relevant differences to note here.

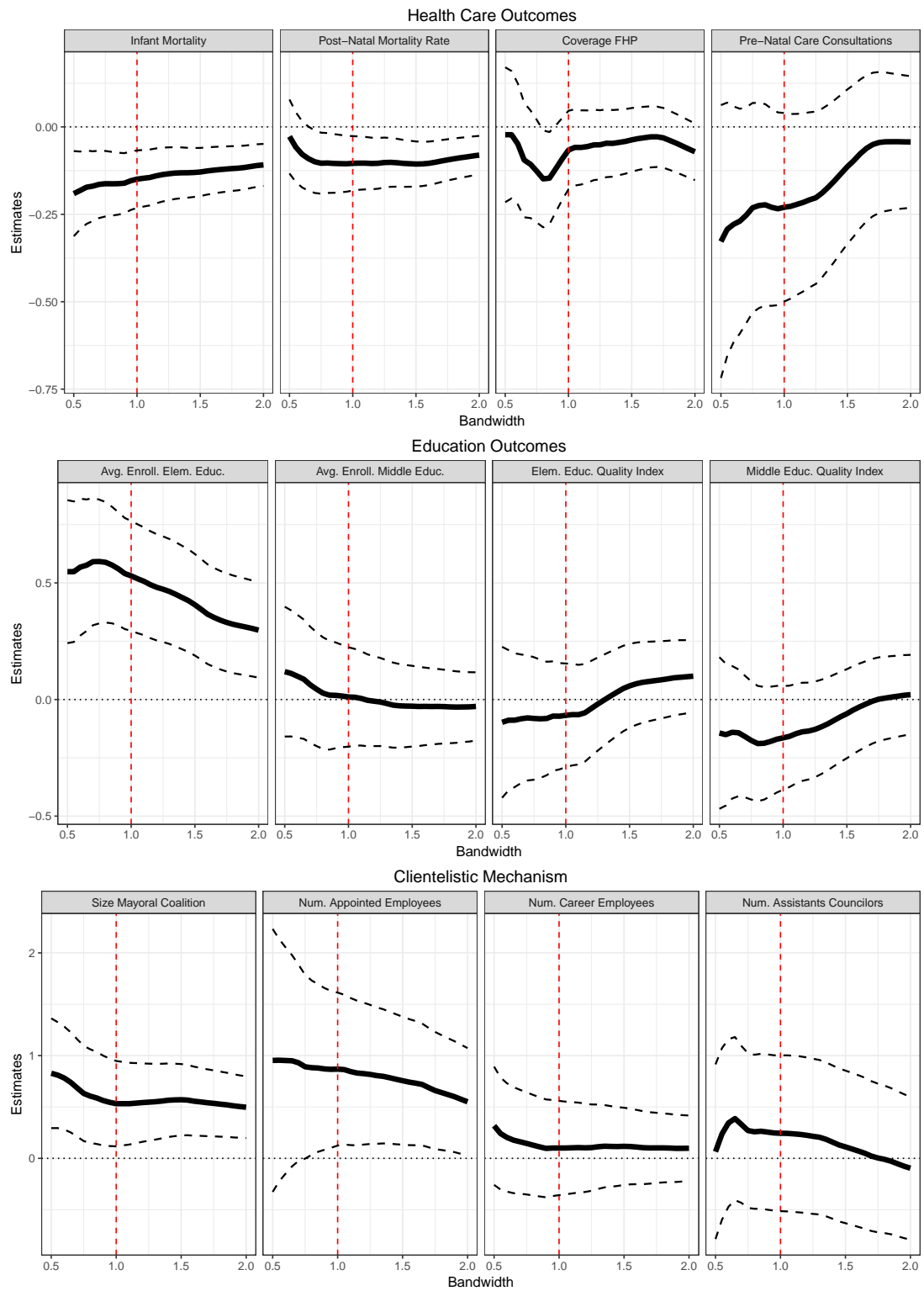


Figure 3: Sensitivity Analysis for the Bandwidth Selection