

# Incumbency Advantage in Brazil: Evidence from Municipal Mayor Elections \*

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## **Abstract**

I study the incumbency advantage of political parties in Brazil's municipal mayor elections using a regression discontinuity design. Comparing municipalities where a party barely lost the 2000 mayor elections to municipalities where it barely won, I find evidence of a strong negative effect of incumbency on both the vote share and the probability of winning in the following election. The results are robust to different specifications and estimation strategies, with excellent balance in observable characteristics. The findings are consistent with previous evidence on negative incumbency effects in developing countries, and suggest that in a context of high institutional instability, short electoral horizons and low reputation costs, incumbents may have incentives to disregard the party's reputation and engage in rent-seeking activities. This phenomenon is likely to be exacerbated when parties lack the capacity to discipline their members, a pervasive feature of Brazilian politics.

**Keywords:** Incumbency advantage, regression discontinuity, Brazilian politics

# 1 Introduction

A vast number of scholars have argued that incumbent legislators in the United States enjoy a substantial electoral advantage over challengers who dispute their seats.<sup>1</sup> This advantage is attributed to a variety of different factors, including the ability of incumbents to deter high-quality challengers, their exclusive access to direct perquisites of office such as franking privileges, name recognition and means to perform constituency service, and the ability of incumbency to function as a cue when partisan ties are weak. The literature on incumbency advantage mostly focuses on the *personal* advantage of incumbent legislators, but recent work by Lee (2008) has shown that this advantage extends also to *parties*.

The arguments and evidence for the U.S. have contributed to the idea that being an incumbent is intrinsically advantageous, emphasizing the access to resources to mobilize and please the electorate that incumbency brings to both parties and politicians. But incumbency also brings substantial responsibilities and generates expectations on the electorate which only incumbents have the ability to frustrate. In a context of high institutional instability, short electoral horizons and low reputation costs, incumbents may engage in rent-seeking activities which ultimately may result on a net *negative* effect of incumbency on subsequent electoral outcomes.

This suggests that incumbency may have vastly different consequences in developing countries, where incentives to engage in rent extraction usually run high. Although the evidence is scarce, the few scholars who have studied incumbency effects in developing countries have failed to find a positive effect of incumbency on electoral outcomes. Linden (2004) and Uppal (2005) estimate incumbency effects in India's parliamentary elections at the national and state level, respectively, and find a *negative* incumbency advantage, i.e. an incumbency disadvantage. Miguel and Zahidi (2004) estimate incumbency effects in national parliamen-

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<sup>1</sup>The list is too long for an exhaustive enumeration. The studies include Alford and Brady (1989), Ansolabehere, Brady, and Fiorina (1988), Ansolabehere, Snyder, and Stewart (2000), Cox and Katz (1996), Cox and Morgenstern (1993), Erikson (1971), Erikson (1972), Ferejohn (1977), Fiorina (1977), Gelman and King (1990), Jacobson (1987), Krehbiel and Wright (1983), and Levitt and Wolfram (1997). See Ansolabehere and Snyder (2002) for a study that also considers executive offices.

tary elections in Ghana and find negative but insignificant effects on both the vote share and the probability of winning in the following election. All three studies use a regression discontinuity design and thus concentrate on the incumbency effects for parties, not individual candidates.

This paper contributes to the study of incumbency effects in developing countries by analyzing Brazil's municipal mayor elections using, as previous work, a regression discontinuity design. It is well known that estimating the effects of incumbency poses great methodological challenges due to the reciprocal causation between incumbency status and political skills broadly understood. Lee (2008) formally justified using regression discontinuity to estimate the incumbency advantage of a party when there is a random chance element to the actual vote share obtained in the elections. I apply this design to study the incumbency effect for Brazil's three largest political parties at the municipal level: Partido do Movimento Democrático Brasileiro (PMDB), Partido da Frente Liberal (PFL) and Partido da Social Democracia Brasileira (PSDB). By comparing municipalities where a given party barely lost to municipalities where it barely won in the 2000 elections, I find evidence of a *negative* effect of incumbency on both the vote share obtained and the probability of winning in the 2004 elections. The results are robust to different specifications, and excellent balance in observable characteristics is obtained in all cases. This is particularly important, as the result of local independence implies that the distribution of all pre-treatment characteristics must be indistinguishable around the discontinuity threshold.

I interpret the results in light of two well known characteristics of the Brazilian political system, namely, the strong autonomy of Brazil's subnational governments and the weak institutionalization of its party system. Brazilian municipalities are highly decentralized, giving mayors substantial authority over local resources and making the municipal executive politically attractive. Mayors have access to numerous resources which can in principle be used to perform constituency service and secure an advantage in subsequent elections. But their time horizon is short, as they are elected for four years and can be consecutively

reelected only once. The continuation of their political careers is either the state or the national level, where the municipal constituents are largely inconsequential in the case of small and medium sized municipalities – which are the overwhelming majority of the total number of Brazilian municipalities. In the absence of strong parties which can discipline individual politicians, mayors have an incentive to engage in rent-seeking behavior, particularly in their second term. Voters, in turn, have only one way to express their dissatisfaction with the past performance of a lame-duck mayor, namely, voting against the mayor’s incumbent *party*.

The rest of the paper is organized as follows. Section 2 discusses Brazil’s institutional background. Section 3 presents the methodology. Section 4 briefly explains the data sources, and Section 5 presents the results. The paper concludes with a discussion in Section 6.

## 2 Institutional Background

Scholars have long emphasized two fundamental features of Brazil’s political system: a very strong federalism and a weakly institutionalized party system. In this section, I provide a brief overview of Brazil’s institutional background with an emphasis on these two features, which are crucial for an adequate interpretation of the results presented in Section 5.

When Brazil’s *Old Republic* was founded in 1891, a highly decentralized federal system was put in place. In this early period, known as the “Politics of the Governors”, state governors decisively dominated the country’s politics (Samuels (2004)). Although the military government of 1930–1945 sought to debilitate local governments and impose a strong central authority, the power of the states was never completely dismantled, and by the time democracy returned in 1945 it was clear that governors were crucial players in the political arena. States recovered a crucial position in the relationship between the national executive and the national legislature: having access to substantial resources, governors exerted influence over national legislators elected from their state, for whom access to the state networks of patronage was crucial to advance their political careers (Abrucio 1998; Samuels

2002). The military regime installed in 1964 tried to undermine these state-based support networks but ultimately failed (Samuels 2004), and states entered Brazil's latest democratic experience in 1989 with remarkable autonomy and high influence on the national political scene.<sup>2</sup> Governors continue to be considered the "power brokers" in Brazil's legislative and distributive politics, due to their influence on their state's Congressional delegations through broad clientelistic networks and their control of nominations to most important offices, and their overall control of state-level politics via pork-barrel funds (Ames 2001a; Abrucio 1998; Carey and Reinhardt 2001; Montero 2005; Samuels and Abrucio 2000; Samuels 2002)

The political power of municipalities was much more limited in the pre-1964 period, but this situation gradually changed during the 1970s and 1980s. Samuels (2000b, 2004) has argued that the continuation of direct elections in a large number of municipalities during the military regime together with the interruption of the states' intermediary role between the national executive and municipal governments, gradually contributed to an increase in municipal political autonomy during the military regime. In particular, these limitations in the intermediary role of states led to an increase in the political capital of municipal mayors, who were the politicians most clearly able to claim credit for the implementation of projects at the local level.

This gradual increase in municipal decentralization and autonomy was crystallized in the 1988 Constitution, which formally established the Brazilian federation as formed by the Union (União), the States (Estados), the Federal District (Distrito Federal) and the Municipalities (Municípios). The new constitution thus established the legal status of municipalities as federal entities. Article 30 of Chapter IV in the Constitution established the responsibilities of municipalities, which include the protection of historical and cultural patrimony, the parcelling of land, and the organization and provision of public services of local interest (particularly systems of public transportation). The provision of pre-school and

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<sup>2</sup>The choice of the year 1989 as the ending point of the second military dictatorship is somewhat arbitrary. Although the first democratic presidential elections were not held until 1989, it is generally considered that the period of democratization began much earlier since free elections were held for all offices but president in 1982 and 1986.

primary education and health services are also the responsibility of municipalities, though these count with the technical and financial cooperation of the state and the national government.<sup>3</sup> Brazilian municipalities are currently considered among the most decentralized and autonomous subnational units below the state level in all Latin America (Nickson 1995) and enjoy substantial policy responsibilities (Costa 1998; Samuels 2004).

Moreover, the strength of Brazil's subnational governments has had an impact in the career goals of politicians. Strong state governments coupled with high municipal autonomy make municipalities an attractive destination for ambitious politicians. Data on the career path of politicians show that municipal-level positions are increasingly sought by politicians *after* they serve in Congress (Samuels 1999a, 1998, 2000a,b).

Another feature of Brazil's political system is the weakness of its political parties. Scholars have long argued that Brazil has a weakly institutionalized party system, with high electoral volatility, low levels of party identification and voting in the electorate, high fractionalization, little capacity of parties to exercise discipline over their members, and lack of strong ideological platforms (e.g. Ames 2001a,b; Mainwaring 1993, 1999; Kinzo 2003; Collier and Collier 2002; Samuels 1999a).<sup>4</sup> Moreover, party switching in Brazil's Chamber of Deputies is a common phenomenon (e.g. Desposato 2006).

Some of the reasons that have been cited for weakness of national party labels is Brazil's electoral rules. Federal and state deputies are elected through a system of open-list proportional representation under which deputies are elected in at-large statewide districts with very large magnitude, which effectively encourages candidate-centered electoral competition (Kinzo 2003; Samuels 1999b; Mainwaring 1991). Another reason, described in detail above, is the extensive control of governors over their states' Congressional delegation, which undermines the possibility of nationally cohesive platforms.

Brazil has currently 5,564 municipalities. The mayor (*prefeito*) is in charge of the mu-

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<sup>3</sup>For an overview of the responsibilities and characteristics of Brazilian municipalities, see IBGE (2001, 2002).

<sup>4</sup>Figueiredo and Limongi (2000) present a different perspective.

nicipal executive, and a municipal legislature (*camara de vereadores*) is in charge of local legislative matters. Since 1996, both the mayor and the municipal legislature are elected in general elections every four years. The legislature is elected by a proportional representation system with seats allocated according to a divisors system among parties that attain a minimum vote share, while the mayor is elected by simple majority. Although twenty-six different parties won the mayor office in at least one municipality in the 2000 elections, only five parties won at least in five percent of the municipalities.

The analysis in this paper concentrates in the three parties which won the highest number of municipal executive offices in 2000: the Brazilian Social Democratic Party (PSDB), the Party of the Brazilian Democratic Movement (PMDB) and the Party of the Liberal Front Party (PFL). The PMDB was originally the MDB (Brazilian Democratic Movement), the official opposition party established by the military regime in 1966. Its name was changed to PMDB in 1978, and it is considered a centrist party. The PSDB was created in 1988 by a dissident group of the PMDB and follows a social democratic doctrine. Finally, the PFL was created in 1984 by dissidents of the PDS, the party which provided support to the military regime of 1966. The PSDB is the party of Fernando Henrique Cardoso, the Brazilian president between 1994 and 2002, which formed an alliance with the PFL and the center-right Brazilian Labour Party (PTB). Cardoso was succeeded by Luiz Inácio Lula da Silva in 2002, who is the leader of the Workers Party (PT), Brazil's most important leftist party. Although its importance at the municipal level has steadily increased in later years, the PT controlled only three percent of municipalities in 2000.

### **3 Methodology**

#### **3.1 Incumbency Advantage: A disambiguation of the outcome of interest**

Studying the incumbency advantage in Brazil is no easier than studying it everywhere else. Although American politics scholars have studied the phenomenon of incumbency



advantage for decades, it remains a topic plagued by methodological problems which have not been fully solved. Erikson (1971) was the first to recognize the methodological challenges involved in the estimation of the *causal* effect of incumbency. As it is well known now, a positive relationship between incumbency status and electoral success does not warrant a causal interpretation due to a number of confounding factors, including that highest quality candidates are the most likely to become incumbents, and that candidates entry and exit strategically according to their evaluation of future electoral fortunes.

Erikson (1971, 1972) and other early work used mainly two measures of incumbency advantage, *sophomore surge* and *retirement slump*. The *sophomore surge* measure is defined as the gain in votes that occurs when a candidate who won at election  $t$  for the first time runs for reelection at election  $t + 1$ , while the *retirement slump* measure is defined as the falloff in the party's vote that occurs when an incumbent that runs for reelection and wins at election  $t$  retires at election  $t + 1$ , when the party defends the seat with a non-incumbent. A third measure of incumbency advantage proposed by Gelman and King (1990) is theoretically defined as the difference between the proportion of the vote received by the incumbent legislator if he runs against a major party opposition and the proportion of the vote received by the incumbent party if the incumbent legislator does not run and all major parties compete for the open seat. Gelman and King proposed to estimate this measure by regressing the vote share obtained by a given party at election  $t$  on the vote share obtained by that same party at election  $t + 1$ , a dummy that indicates incumbency status of the party's candidate and a variable that indicates the party that won the election at  $t$ .

The *sophomore surge* and *retirement slump* measures provide an unbiased estimate of the incumbency advantage only under very strong assumptions. Namely, they require that the decision to run or not run for reelection at election  $t + 1$  is unrelated to the vote share that will be obtained in this election. Similarly, Gelman and King (1990)'s proposed estimator relies on the assumption that the decision to run for reelection is exogenous to the votes that the candidate obtains at election  $t + 1$  if he does decide to run. As mentioned above, since

the decision to run for reelection is generally related to the expected electoral success (see, for example, the evidence presented by Cox and Katz (2002)), these measures are likely to give biased estimates of the incumbency advantage.

Recognizing these difficulties, recent approaches have proposed to use natural experiments and quasi-experimental designs in which incumbency status may be considered to be *as if* randomly assigned. Ansolabehere et al. (2000) propose to use decennial redistricting to identify the personal incumbency advantage by comparing the incumbent's vote-share in units she has represented in the past with her vote-share in units that become part of her district after redistricting, and Lee (2008) proposes to use a regression discontinuity design which compares the electoral outcomes at election  $t + 1$  of barely winners and barely losers at election  $t$ .

Although these approaches are promising they must be used with caution, as the quest for a solution to methodological problems usually results in a redefinition of the parameters that are being estimated (Sekhon and Titiunik (2007)). This is the case with Lee (2008)'s design, which by comparing vote shares of barely-losing and barely-winning parties estimates the (local) *party* incumbency advantage and not the *individual* incumbency advantage – the original outcome of interest, carefully defined by Gelman and King (1990).

The research presented here is an attempt to learn about the functioning of the Brazilian party system, and so I purposely define the party incumbency advantage as my outcome of interest. Therefore, in this case, the use of a regression discontinuity design is both appropriate and justified. But the comparisons with the findings in the American politics literature should be done with caution, as the estimands are not the same.

In the next subsection, I present a brief overview of the regression discontinuity design that I use to estimate the party incumbency advantage in Brazil's mayor elections.

### 3.2 Regression Discontinuity: a Local Estimand

Regression discontinuity was introduced in the social sciences by Thistlethwaite and Campbell (1960), and its relation to the treatment effects literature was formally established by Hahn, Todd, and van der Klaauw (2001). More recently, Lee (2008) showed that using this design is justified even in the presence of endogenous sorting because localized random treatment assignment can occur as long as agents lack the ability to sort *precisely* around the discontinuity threshold. I use this research design to estimate the incumbency advantage at the level of the party in Brazil's mayor municipal elections.

For the purposes of the methodological discussion, let municipality  $i$  at election  $t$  have  $J$  political parties that dispute the municipal major elections. For  $j = 1, \dots, J$ , let  $V_{it,j}$  be the vote share obtained by party  $j$  in municipality  $i$  in election  $t$  and  $V_{it,(1)}, \dots, V_{it,(J)}$  be the corresponding order statistics. The margin of victory for party  $k$  is defined as the vote share obtained by party  $k$  minus the vote share obtained by party  $k$ 's strongest opponent, where the latter is defined as the party that obtains the highest vote share if party  $k$  loses the election and the party that obtains the *second* highest vote share if party  $k$  wins. Formally, party  $k$ 's margin of victory is given by

$$Z_{it,k} \equiv \begin{cases} V_{it,k} - V_{it,(J-1)} & \text{if } V_{it,k} = V_{it,(J)} \\ V_{it,k} - V_{it,(J)} & \text{otherwise} \end{cases} \quad (1)$$

It follows that the rule that determines the incumbency status of party  $k$  at election  $t+1$  in municipality  $i$ , denoted by  $I_{it+1,k}$  is

$$I_{it+1,k} = \begin{cases} 1 & \text{if } Z_{it,k} \geq 0 \\ 0 & \text{if } Z_{it,k} < 0 \end{cases} \quad (2)$$

Let  $Y_{it+1,k}^1$  denote the outcome of interest for party  $k$  in municipality  $i$  at election  $t + 1$  when  $I_{it+1,k} = 1$  and  $Y_{it+1,k}^0$  denote the outcome of interest for party  $k$  when  $I_{it+1,k} = 0$ . The effect of interest is  $\tau_k \equiv \mathbb{E}(Y_{it+1,k}^1 - Y_{it+1,k}^0)$ . Of course, for a given election in a given municipality, a party cannot be the incumbent and not the incumbent simultaneously, and hence one only observes  $Y_{it+1,k} = I_{it+1,k}Y_{it+1,k}^1 + (1 - I_{it+1,k})Y_{it+1,k}^0$ . Without further assumptions,  $\tau_k$  is not identified.

But progress can be made by exploiting the discontinuity in the assignment of incumbency status given by equation (2). As shown by Hahn et al. (2001), if  $\mathbb{E}(Y_{it+1,k}^1|Z)$  and  $\mathbb{E}(Y_{it+1,k}^0|Z)$  are continuous at  $Z_{it,k} = 0$  and have positive density around  $Z_{it,k} = 0$ , the expected causal effect of incumbency status on the outcome of interest is identified at the discontinuity point. Formally,

$$\alpha_k \equiv \mathbb{E}(Y_{it+1,k}^1 - Y_{it+1,k}^0|Z = 0) = \lim_{Z \downarrow 0} \mathbb{E}(Y_{it+1,k}|Z) - \lim_{Z \uparrow 0} \mathbb{E}(Y_{it+1,k}|Z)$$

Therefore, the discontinuity in the rule that determines which party wins office provides an opportunity to observe the average difference in potential outcomes by comparing points on either side of the  $Z_{it,k} = 0$  threshold. Two things should be noted. First, the crucial assumption is the continuity of the expected potential outcomes at the threshold, and the question arises of whether this assumption holds for the problem considered here. Second, in general  $\tau_k \neq \alpha_k$ . This is, under these assumptions this approach only identifies a causal effect at  $Z_{it,k} = 0$ , and without additional assumptions, such as constant treatment effects, the results do not generalize to the effect at other values of  $Z$ .

Lee (2008) formally established the link between these assumptions and a general problem where agents non-randomly self-select into treatment. Applying his findings to the particular problem of estimating the incumbency advantage, if there is a non-negligible random chance component to the ultimate vote share obtained by party  $k$  in municipality  $i$  at election  $t$  and the conditional density of  $V_{it,k}$  is continuous, municipalities just below  $Z_{it,k} = 0$  will be

valid counterfactuals for municipalities just above  $Z_{it,k} = 0$  to identify a weighted average treatment effect for the entire population, where the weights are given by the probability that party  $k$  in municipality  $i$  draws a  $Z_{it,k}$  near the threshold. Very importantly, Lee (2008) also showed that since the regression discontinuity approach provides local independence of treatment assignment and potential outcomes in a neighborhood of  $Z_{it,k} = 0$ , the distribution of pre-determined characteristics in this neighborhood must be the same on both sides of this threshold. Thus, observed covariates provide important information to test the validity of the design.

## 4 Data

I constructed a dataset at the municipality level containing demographic, socio-economic and electoral variables. Data on population levels were obtained from the Brazil's 2000 Demographic Census, available at the Instituto Brasileiro de Geografia e Estatística (IBGE). Municipality-level GDP was also obtained from the IBGE; a survey of the methodology used in municipal accounting can be found in IBGE (2004). Data on social indicators and the public administration of municipalities were obtained from the IBGE's *Pesquisa de Informações Básicas Municipais*, a comprehensive survey conducted every year in all Brazilian municipalities. While population counts were accessed at the IBGE's official website (<http://www.ibge.gov.br/english>), disaggregated data on GDP and municipalities' social indicators were specially requested.

Election returns for the mayor and city council elections for 2000 and 2004 were obtained from the Tribunal Superior Eleitoral (<http://www.tse.gov.br>). The data contain individual candidates' characteristics, electoral returns by party in each municipality, and characteristics of the electorate.

Socio-economic and demographic data were merged to electoral data to create a single municipality-level dataset. The merge was done by matching of municipality names by state,

as the municipality identifiers used by the TSE are not equivalent to those used by the IBGE. Municipalities which ceded territory for the creation of new municipalities between 2000 and 2004 were excluded from the sample (along with all municipalities created after 2000), to avoid time-varying geographical units. The final dataset contains 5,373 municipalities.

## 5 Results

I study Brazil's three largest parties at the municipal level: Partido do Movimento Democrático Brasileiro (PMDB), Partido da Frente Liberal (PFL) and Partido da Social Democracia Brasileira (PSDB), and consider two different outcomes to capture electoral success: (i) the probability that party  $k$  wins the major office at election  $t + 1$ , and (ii) the vote share obtained by party  $k$  at election  $t + 1$ .

I also consider the effect of incumbency on whether the party is a candidate at election  $t + 1$ , since in a small number of cases the parties that barely win or lose in election  $t$  do not run in election  $t + 1$ . Note that this would bias the results if the decision to become a candidate in election  $t + 1$  is related to the expected electoral success in that election. There are two reasons why this potential behavior would not invalidate the results. First, as shown below in Tables 4, 5 and 6, for all three parties the probability of running in election  $t + 1$  is statistically indistinguishable between both sides of the discontinuity, suggesting that, if it exists, this selection mechanism operates equally in treatment and control municipalities. Second, if parties decided not to run in anticipation of a bad electoral performance, this would bias the results towards finding a positive effect to incumbency. Since the effects of incumbency are found to be negative, my results provide an upper bound for the true incumbency advantage.

I consider two neighborhoods around the threshold. The first neighborhood keeps only those municipalities where the absolute value of the margin of victory of the party under study is at most 5%, while the second neighborhood keeps only those municipalities where

this absolute value is at most 3%. A first test of the validity of the identifying assumptions is the comparison of the distribution of pre-treatment characteristics on both sides of the discontinuity threshold. Tables 1, 2 and 3 show the difference in means and the p-values of Kolmogorov-Smirnov (KS) tests for these two neighborhoods for the three different parties.

The variables at the candidate level include the gender, education, age and probability of reelection of the winning candidate, while the variables at the municipality level include the total number of votes cast, the vote share of the winning party, the vote share of the second-runner party, the number of candidates, the number of effective candidates, the size of the municipal legislature, the municipal population, and the municipality GDP. Overall, the tables show excellent balance in almost all covariates considered for the three parties under study. A total of six variables across the three parties considered appear unbalanced in the larger 5% window. Very importantly, this lack of balance disappears completely in the smaller 3% window leading to statistically significant differences between municipalities on both sides of the discontinuity as measured in terms of both their means and their entire empirical distributions as measured by the KS tests.

Next, I consider the estimation of the parameters of interest. I estimate three different models for each of the outcomes and for each of the parties considered:

$$Y_{it+1,k} = \mu_k + \alpha_k \cdot 1\{Z_{it,k} \geq 0\} + \epsilon_{it+1,k} \quad (3)$$

$$Y_{it+1,k} = \mu_k + \alpha_k \cdot 1\{Z_{it,k} \geq 0\} + x'_{it,k}\gamma + \epsilon_{it+1,k} \quad (4)$$

where  $\mu$  is a constant and  $x_{itk}$  is a vector of pre-determined characteristics that includes both municipality-level and party-level covariates. Models (3) and (4) are estimated only in a neighborhood of the discontinuity threshold where local independence is expected to hold. The estimated parameter  $\hat{\alpha}_k$  in Model (3) is a simple difference in means on both sides of the discontinuity. Model (4) adds covariates as an indirect test to the robustness of the local independence assumption, since the distribution of all variables in  $x_{itk}$  must be identical on both sides of the threshold.

I also consider a more flexible model that uses the entire sample given by

$$Y_{it+1,k} = \alpha_k \cdot 1\{Z_{it,k} \geq 0\} + m(Z_{it,k}, x_{it,k}) + \epsilon_{it+1,k} \quad (5)$$

where  $m(Z_{it,k}, x_{it,k})$  is specified as a fourth-order polynomial on  $Z_{it,k}$  and  $x_{it,k}$  that captures continuous changes in the dependent variable with respect to the margin of victory and all other pre-determined characteristics. Model (5) follows Green, Leong, Gerber, and Larimer (2008), Lee (2008) and Porter (2003) and uses the entire sample while allowing for a flexible relation between the outcome, the margin of victory and all pre-determined covariates. If Model (5) is correct, this specification should also be consistent for the parameter of interest  $\alpha_k$ .

Table 4 shows the results for the PMDB party, which is Brazil's largest party at the municipal level. As mentioned above, I find no statistically significant effects of incumbency on the probability of running. This table also shows a negative and statistically significant effect of incumbency on the probability that party PMDB wins the 2004 election. The estimated coefficient is about  $-20\%$ , and this result is robust across models and the inclusion of covariates. Similarly, the estimated effect of incumbency on the vote share obtained by party PMDB is about  $-6\%$ .

Table 5 presents similar results for the PFL party. The results are similar to those found for party PMDB for the three outcomes considered. In particular, there is no effect on the probability of being a candidate, and negative effects on both the probability of winning and the vote share in the 2004 election. Finally, Table 6 presents the results for party PSDB. The effect of incumbency on the probability of winning remains negative but is not statistically significant in many of the specifications considered. The estimated effect on the vote share is statistically insignificant in all cases.

To illustrate the regression discontinuity estimate of the incumbency advantage on the probability of winning, I plot for each party the estimated probability of winning the 2004



election as a function of the margin of victory in the 2000 election. Each point is an average of the indicator variable for winning the 2004 election for each interval. The graphs for the three parties are shown in Figures 1, 2 and 3.

## 6 Discussion

Using a regression discontinuity design to analyze Brazil's municipal mayor elections, I find a strong negative effect of becoming the incumbent party in 2000 on both the probability of winning and the vote share in 2004. The results are negative for the three parties which control over seventy percent of Brazilian municipalities and are consistent with the negative and non-positive effects found by Linden (2004), Miguel and Zahidi (2004) and Uppal (2005) in developing countries, but they are in sharp contrast to the large and positive effects found by Lee (2008) in the U.S.

The finding of so large negative party incumbency effects for an executive office deserves further analysis and explanation. As explained in Section 2, Brazilian mayors enjoy substantial autonomy and access to a large number of local resources, and thus they have the ability of targeting resources to constituents. Therefore, the fact that mayor's party is systematically punished cannot be easily explained by an inability of mayors to respond to the desires of her constituents.

Further analysis is currently being conducted to provide an explanation for this phenomenon that can be sustained with empirical evidence. The explanations explored concentrate on the interaction of the weakness of the Brazilian party system, the short temporal horizon of mayors and the general characteristics of the careers of Brazilian politicians. It is generally argued that the threat of no reelection is used by constituents to exercise control over politicians (see, e.g. Barro 1973; Ferejohn 1986). But when the political horizon is short, incumbents may have incentives to act on their private preferences rather than on the public good. This might be most problematic when parties exercise no control over incumbents,

and when the politician's future career is largely independent of her performance in previous offices.

Brazil's mayor elections seem to fit this description. Mayors serve a four-year period, and can only be consecutively elected for two terms. The most likely continuation of their political careers is either at the state or national level, where the constituents of her municipality are not pivotal (except for very large municipalities, which are the minority). The combination of these features with weak parties which lack the ability to discipline their members may result in mayors having little incentive to act in the best interest of the public, particularly in their second term. If this is the case, voters have only one way to express their dissatisfaction with the past performance of a lame-duck mayor, namely, voting against the mayor's incumbent *party*.

Future versions of this paper will concentrate on expanding this explanation of the phenomenon of party incumbency disadvantage in Brazilian municipalities and establishing whether it is supported by empirical evidence.

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Table 1: Balance tests for PMDB party

	Municipalities in 5 percent window				Municipalities in 3 percent window			
	Mean Tr	Mean Co	Diff means	KS pvalue	Mean Tr	Mean Co	Diff means	KS pvalue
Gender winner	0.952 (0.011)	0.946 (0.011)	0.007 (0.016)	0.783	0.966 (0.012)	0.933 (0.016)	0.032 (0.022)	0.281
Education winner	11.914 (0.254)	12.524 (0.248)	-0.610 (0.351)	0.346	11.730 (0.318)	12.156 (0.328)	-0.425 (0.464)	0.386
Age winner	50.074 (0.507)	48.327 (0.509)	1.748 (0.719)	0.125	50.821 (0.667)	48.911 (0.670)	1.909 (0.947)	0.206
Winner reelected	0.281 (0.023)	0.330 (0.024)	-0.049 (0.033)	0.277	0.298 (0.029)	0.354 (0.030)	-0.057 (0.043)	0.356
Total votes	10692.412 (771.385)	10006.806 (642.796)	685.606 (909.051)	0.717	9503.496 (792.422)	9441.258 (633.426)	62.238 (895.800)	0.850
Vote share winner	0.463 (0.003)	0.474 (0.003)	-0.011* (0.004)	0.282	0.465 (0.004)	0.468 (0.004)	-0.003 (0.005)	0.292
Vote share second	0.439 (0.003)	0.448 (0.003)	-0.009 (0.004)	0.251	0.452 (0.004)	0.451 (0.004)	0.001 (0.005)	0.126
Number candidates	2.794 (0.048)	2.801 (0.048)	-0.007 (0.068)	0.998	2.678 (0.057)	2.805 (0.063)	-0.127 (0.089)	0.458
Number eff candidates	2.401 (0.028)	2.319 (0.024)	0.082 (0.034)	0.267	2.338 (0.034)	2.333 (0.033)	0.005 (0.046)	0.615
Size legislature	10.573 (0.136)	10.726 (0.132)	-0.154 (0.187)	0.353	10.488 (0.159)	10.609 (0.158)	-0.122 (0.223)	0.711
Population	20730.041 (1752.257)	18641.573 (1267.955)	2088.468 (1793.159)	0.319	18636.350 (2024.777)	17578.465 (1273.212)	1057.885 (1800.594)	0.847
GDP	125132.288 (16055.107)	101854.468 (11605.064)	23277.820 (16412.038)	0.351	97668.002 (11845.388)	89994.362 (11571.992)	7673.639 (16365.268)	0.826
Sample size	400				249			

Standard errors in parenthesis; \*\*\* 1 percent significant, \*\* 5 percent significant, \* 1 percent significant



Table 2: Balance tests for PFL party

	Municipalities in 5 percent window				Municipalities in 3 percent window			
	Mean Tr	Mean Co	Diff means	KS pvalue	Mean Tr	Mean Co	Diff means	KS pvalue
Gender winner	0.907 (0.018)	0.944 (0.014)	-0.038 (0.020)	0.286	0.909 (0.024)	0.921 (0.022)	-0.012 (0.031)	0.845
Education winner	11.365 (0.298)	11.701 (0.335)	-0.336 (0.474)	0.247	10.758 (0.416)	11.048 (0.462)	-0.290 (0.653)	0.447
Age winner	50.729 (0.625)	48.194 (0.638)	2.534* (0.903)	0.171	50.318 (0.791)	47.571 (0.829)	2.747 (1.172)	0.206
Winner reelected	0.378 (0.030)	0.328 (0.029)	0.050 (0.041)	0.406	0.387 (0.040)	0.360 (0.039)	0.027 (0.056)	0.816
Total votes	8593.037 (515.958)	7917.626 (570.143)	675.411 (806.304)	0.328	8325.773 (669.132)	7304.600 (463.173)	1021.173 (655.026)	0.453
Vote share winner	0.483 (0.003)	0.469 (0.004)	0.014* (0.006)	0.184	0.472 (0.005)	0.465 (0.005)	0.007 (0.007)	0.501
Vote share second	0.456 (0.003)	0.445 (0.004)	0.011 (0.006)	0.060	0.455 (0.005)	0.453 (0.005)	0.002 (0.007)	0.008
Number candidates	2.659 (0.050)	2.740 (0.062)	-0.081 (0.088)	0.609	2.760 (0.072)	2.667 (0.077)	0.093 (0.110)	0.209
Number eff candidates	2.246 (0.027)	2.362 (0.035)	-0.116* (0.050)	0.205	2.295 (0.040)	2.338 (0.045)	-0.043 (0.063)	0.248
Size legislature	10.304 (0.110)	10.374 (0.124)	-0.070 (0.175)	0.677	10.200 (0.152)	10.320 (0.154)	-0.120 (0.218)	0.651
Population	16649.552 (1104.487)	15597.585 (1300.147)	1051.968 (1838.686)	0.140	15516.743 (1304.406)	14412.095 (1116.974)	1104.649 (1579.640)	0.636
GDP	50397.487 (4147.552)	45881.137 (6494.894)	4516.350 (9185.167)	0.197	50456.721 (5598.321)	37000.554 (3184.214)	13456.166 (4503.159)	0.197
Sample size	266				150			

Standard errors in parenthesis; \*\*\* 1 percent significant; \*\* 5 percent significant, \* 1 percent significant

Table 3: Balance tests for PSDB party

	Municipalities in 5 percent window				Municipalities in 3 percent window			
	Mean Tr	Mean Co	Diff means	KS pvalue	Mean Tr	Mean Co	Diff means	KS pvalue
Gender winner	0.915 (0.020)	0.907 (0.020)	0.008 (0.029)	0.885	0.897 (0.028)	0.895 (0.028)	0.002 (0.039)	0.935
Education winner	12.511 (0.369)	12.011 (0.307)	0.500 (0.434)	0.052	12.276 (0.496)	12.375 (0.400)	-0.099 (0.566)	0.296
Age winner	47.777 (0.694)	49.722 (0.711)	-1.945 (1.005)	0.217	49.138 (0.969)	49.035 (0.959)	0.103 (1.356)	0.852
Winner reelected	0.374 (0.034)	0.234 (0.030)	0.140** (0.042)	0.029	0.344 (0.043)	0.238 (0.039)	0.106 (0.055)	0.183
Total votes	11522.192 (946.676)	11166.084 (918.179)	356.108 (1298.501)	0.560	10238.754 (955.868)	10566.079 (1299.278)	-327.325 (1837.456)	0.591
Vote share winner	0.466 (0.004)	0.467 (0.004)	0.000 (0.006)	0.879	0.460 (0.006)	0.459 (0.006)	0.002 (0.008)	0.955
Vote share second	0.443 (0.004)	0.442 (0.004)	0.001 (0.006)	0.944	0.447 (0.006)	0.445 (0.006)	0.003 (0.008)	0.936
Number candidates	2.828 (0.063)	2.794 (0.065)	0.034 (0.093)	0.888	2.852 (0.082)	2.730 (0.071)	0.122 (0.100)	0.792
Number eff candidates	2.368 (0.037)	2.381 (0.040)	-0.014 (0.056)	0.837	2.372 (0.048)	2.390 (0.047)	-0.018 (0.067)	0.841
Size legislature	10.929 (0.176)	11.112 (0.212)	-0.183 (0.300)	0.726	10.754 (0.225)	10.810 (0.260)	-0.055 (0.367)	0.642
Population	24063.717 (2304.833)	21901.093 (1925.122)	2162.624 (2722.533)	0.991	20176.607 (2050.253)	20639.222 (2715.237)	-462.616 (3839.925)	0.865
GDP	112047.723 (17699.194)	111455.631 (14904.057)	592.092 (21077.520)	0.389	71738.331 (10372.806)	113881.075 (23091.987)	-42142.744 (32657.001)	0.377
Sample size	206				124			

Standard errors in parenthesis; \*\*\* 1 percent significant, \*\* 5 percent significant, \* 1 percent significant

Table 4: Incumbency Effects for PMDB party

	5 % window	5 % window	3 % window	3 % window	All	All	All	All
EFFECT ON CANDIDANCY ON 2004								
Won in 2000	-0.024 (0.038)	-0.003 (0.043)	0.030 (0.049)	0.072 (0.056)	0.100*** (0.020)	-0.051 (0.033)	0.057 (0.066)	0.046 (0.070)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.677				0.573			
Sample size	577	479	360	294	2430	2430	2062	2047
EFFECT ON WINNING IN 2004								
Won in 2000	-0.185*** (0.049)	-0.208*** (0.056)	-0.173*** (0.063)	-0.188** (0.074)	0.032 (0.026)	-0.217*** (0.043)	-0.210** (0.090)	-0.233** (0.099)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.586				0.448			
Sample size	400	327	249	202	1513	1513	1285	1276
EFFECT ON VOTE SHARE IN 2004								
Won in 2000	-0.045*** (0.014)	-0.044*** (0.017)	-0.056*** (0.018)	-0.068*** (0.022)	0.014* (0.007)	-0.052*** (0.012)	-0.062** (0.025)	-0.071*** (0.027)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.484				0.440			
Sample size	400	327	249	202	1513	1513	1285	1276

Standard errors in parenthesis; \*\*\* 1 percent significant, \*\* 5 percent significant, \* 1 percent significant

Table 5: Incumbency Effects for PFL party

	5 % window	5 % window	3 % window	3 % window	All	All	All	All
EFFECT ON CANDIDANCY ON 2004								
Won in 2000	-0.006 (0.046)	-0.005 (0.051)	-0.092 (0.060)	-0.094 (0.068)	0.123*** (0.022)	0.004 (0.038)	-0.052 (0.075)	-0.058 (0.082)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.595				0.463			
Sample size	451	382	275	232	1973	1973	1727	1719
EFFECT ON WINNING IN 2004								
Won in 2000	-0.211*** (0.060)	-0.201*** (0.068)	-0.227*** (0.080)	-0.267*** (0.095)	0.090*** (0.031)	-0.212*** (0.054)	-0.276** (0.112)	-0.382*** (0.135)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.640				0.452			
Sample size	266	220	150	127	1036	1036	907	903
EFFECT ON VOTE SHARE IN 2004								
Won in 2000	-0.035* (0.018)	-0.045** (0.019)	-0.059** (0.025)	-0.071** (0.029)	0.045*** (0.010)	-0.043** (0.017)	-0.063** (0.032)	-0.078** (0.036)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.493				0.431			
Sample size	266	220	150	127	1036	1036	907	903

Standard errors in parenthesis; \*\*\* 1 percent significant, \*\* 5 percent significant, \* 1 percent significant

Table 6: Incumbency Effects for PSDB party

	5 % window	5 % window	3 % window	3 % window	All	All	All	All
EFFECT ON CANDIDANCY ON 2004								
Won in 2000	-0.025 (0.051)	-0.039 (0.056)	-0.036 (0.066)	-0.056 (0.073)	0.095*** (0.024)	-0.005 (0.043)	-0.023 (0.082)	-0.064 (0.090)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.553				0.515			
Sample size	376	340	232	208	1709	1709	1533	1522
EFFECT ON WINNING IN 2004								
Won in 2000	-0.139** (0.069)	-0.121 (0.074)	-0.083 (0.089)	-0.099 (0.097)	0.014 (0.033)	-0.171*** (0.062)	-0.109 (0.121)	-0.144 (0.142)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.460				0.494			
Sample size	206	189	124	114	970	970	875	871
EFFECT ON VOTE SHARE IN 2004								
Won in 2000	0.009 (0.019)	0.013 (0.020)	0.033 (0.026)	0.035 (0.028)	0.028*** (0.010)	-0.018 (0.019)	0.037 (0.035)	0.025 (0.039)
Polinomial margin	No	No	No	No	No	Yes	Yes	Yes
Voting covariates	No	Yes	No	Yes	No	No	Yes	Yes
Economic covariates	No	Yes	No	Yes	No	No	No	Yes
Mean Control	0.409				0.431			
Sample size	206	189	124	114	970	970	875	871

Standard errors in parenthesis; \*\*\* 1 percent significant, \*\* 5 percent significant, \* 1 percent significant

Figure 1: Incumbency effects for PMDB on probability of winning in 2004

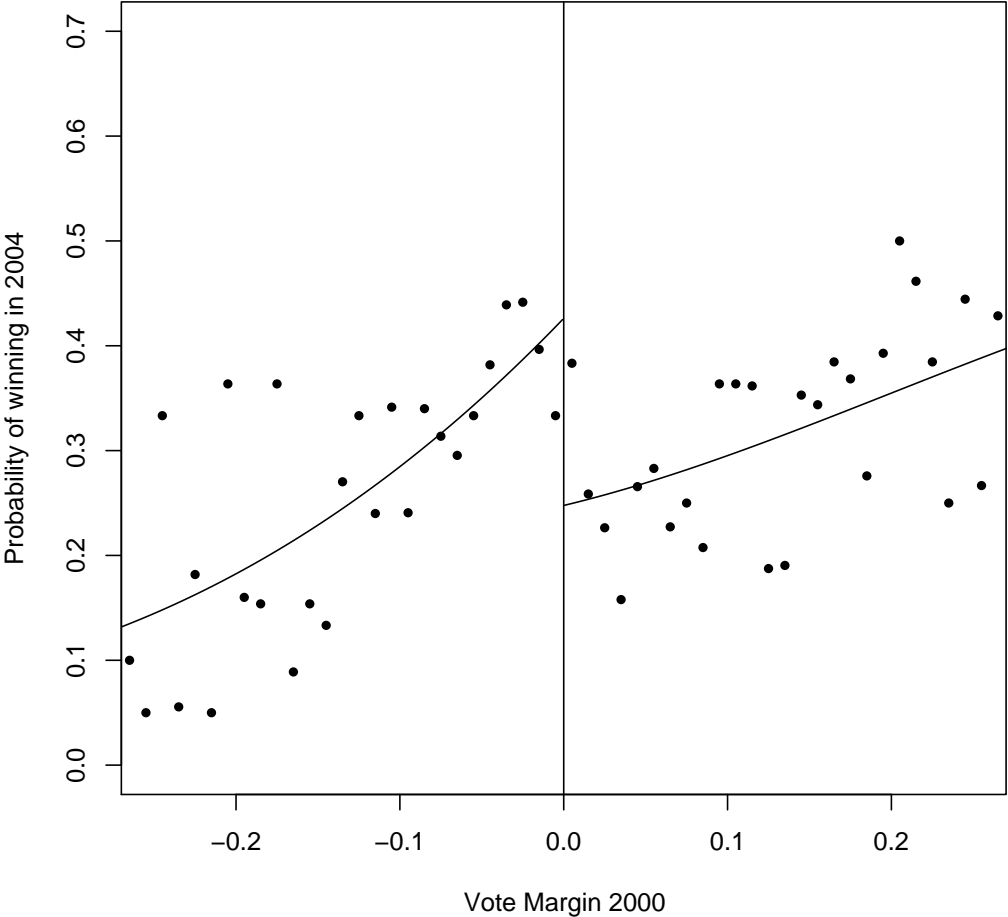


Figure 2: Incumbency effects for PFL on probability of winning in 2004

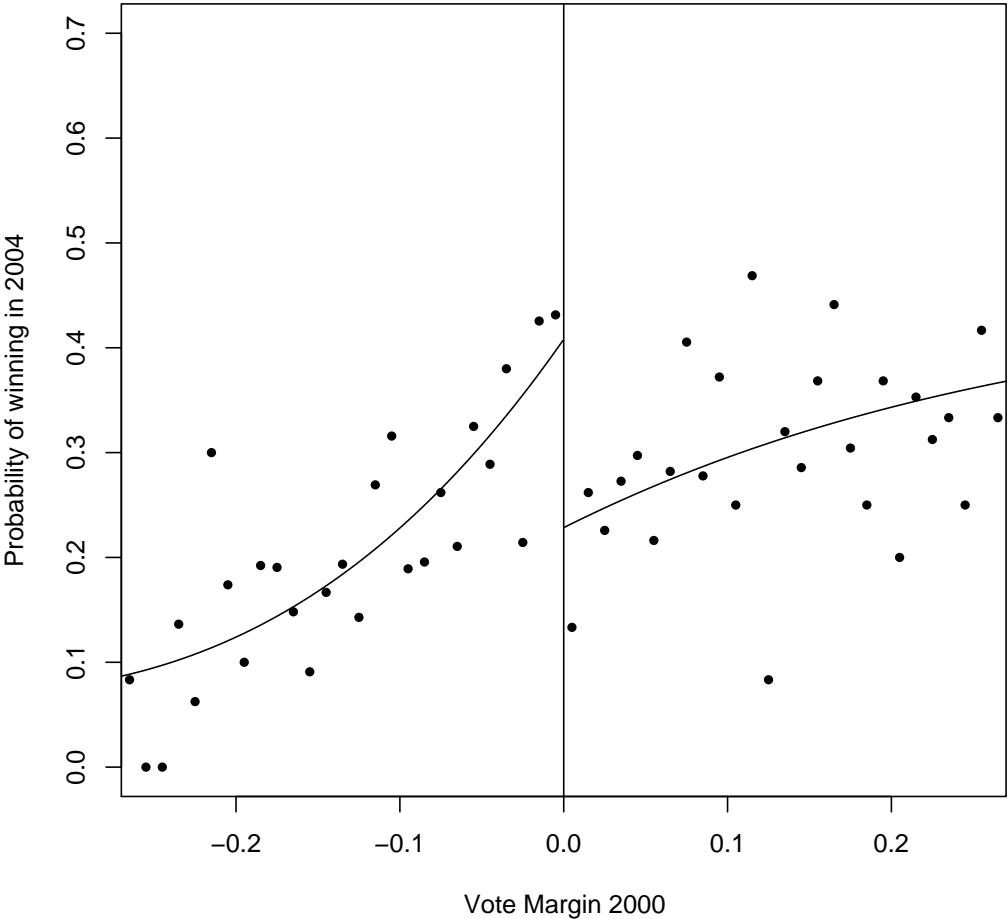


Figure 3: Incumbency effects for PSDB on probability of winning in 2004

