Pontifícia Universidade Católica
do Rio de Janeiro

João F. Mourão

How is Yours Politicians' Business Doing?

Dissertação de Mestrado

Thesis presented to the Programa de Pós–graduação em Economia, do Departamento de Economia da PUC-Rio in partial fulfillment of the requirements for the degree of Mestre em Economia.

Advisor : Prof. Juliano Assunção
Co-advisor: Prof. Claudio Ferraz

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Abstract

Mourão F, João; Assunção, Juliano (Advisor); Ferraz, Claudio (Co-Advisor). **How is Yours Politicians' Business Doing?**. Rio de Janeiro, 2021. 54p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

Between 2004 and 2020, 18.9% of the Brazilian municipalities had at least one mayor that was also a business owner. In Brazil, this office is relevant for government spending allocation and public policy decisions. With this constitutional competence, the elected official could swing resources to their firm directly or indirectly. Even if this is done within the borders of legality, information on the performance of politician-owned enterprises may be relevant for voters. Therefore, this work uses three administrative data sources on candidates, firm ownership, and formal employment contracts to answer if mayor-owned firms grew disproportional during their owner's term. To provide causal interpretation, the estimations are undertaken applying a close election discontinuity design. This work, therefore, compares firms from barely elected mayors with companies owned by almost victorious candidates. It concludes that mayor-owned companies grew approximately 25% more than they would if their owner had lost the election during the four years of the term.

Keywords

Politically Connected Firms; Business Owners in Politics; Close Election; Mayor; Corruption; Businessman; Politics; Development; Political Econom.

Resumo

Mourão F, João; Assunção, Juliano; Ferraz, Claudio. **Como Vai a Empresa do seu Prefeito?**. Rio de Janeiro, 2021. 54p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

Entre 2004 e 2020, 18,9% das cidades brasileiras tiveram ao menos um prefeito que também era empresário. No Brasil, esse cargo é relevante para alocação de recursos governamentais e execução de políticas públicas. Com essa competência constitucional, o representante eleito pode direcionar recursos para sua firma, direta ou indiretamente. Mesmo se isso é feito legalmente, o desempenho empresarial do político eleito pode ser relevante para os eleitores. Por isso, esse trabalho usa 3 bases de dados administrativas, sobre candidatos, donos de empresas e contratos de emprego formal, para responder se as firmas do prefeitos cresceram desproporcionalmente durante seus mandatos. A fim de estabelecer uma interpretação causal, o método de "close election" é aplicado. Esse trabalho conclui que, ao longo dos quatro anos do mandato, as empresas dos prefeitos cresceram, aproximadamente, 25% a mais do que cresceriam se seu dono tivesse perdido a eleição.

Palavras-chave

Firmas políticamente Conectadas; Empresários na Política; Prefeito; Corrupção; Empresário; Desenvolvimento; Economia Política; Política; Close Election.

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ATE - Average Treatment Effect
BNDES – Brazilian Development Bank *(BNDES from the portuguese acronym)*
CAPES – *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*
CNAE - *Código Nacional de Atividade Econômica*
CNPJ - *Cadastro Nacioal da Pessoa Jurídica*
CNPq - *Conselho Nacional de Desenvolvimento Científico e Tecnológico*
CPF - *Cadastro de Pessoa Física*
LATE - Local Average Treatment Effect
MSE - Mean Squared Error
NGO - Non-governmental organization
PT - Workers Party *(BNDES from the portuguese acronym)*
PUC-Rio - Pontifícia Universidade Católica do Rio de Janeiro
RAIS - *Registro Anual de Informação Social*
RDD - Regression Discontinuity Design
WB - World Bank
TI - Transparency International
TN - *Tesouro Nacional*
TSE - *Tribuanl Superior Eleitoral*

1
Introduction

Politically connected firms are widespread, appearing in several countries and contexts (Faccio, 2006). Nonetheless, there are numerous variations on the type of connection. Some companies have politicians, or their family and friends, on their board of directors (Faccio et al., 2006; Do et al., 2021). Others contribute to campaigns (Claessens et al., 2008) or hire politicians directly (Akcigit et al., 2018). Nonetheless, the implications of business owners holding office themselves are less understood.
[1]

In Brazil, businessmen and women are frequently on the ballot. For instance, in the previous four Brazilian municipal elections, entrepreneurs ran for mayor in 40% of the country's cities and won in 19% of the municipalities at least once. To the best of the author's knowledge, this is the first work to depict what happens to their companies while they are holding office.

It is worth noticing that there is nothing intrinsically unlawful about the election of a business owner. They might, for example, have a skill-set that is suitable for politics and, therefore, voters elected them. Nonetheless, some of them may be motivated by rent-seeking prospects. It has been demonstrated that politically connected companies receive a series of advantages from governments (Khwaja & Mian (2005), Boas et al. (2014) and others). From the firm's owner perspective, holding office, therefore, could be a mechanism to receive these benefits without sharing the resulting rents with other politicians (Shleifer & Vishny (1994) and Gehlbach et al. (2010)).

The list of benefits associated with politically connected firms is extensive. They might have better access to credit, (Boubakri et al. (2012) Khwaja & Mian (2005), Infante & Piazza (2014) and Tabajara (2019)), lower odds of

[1] A couple of articles examine this type of situation in the context of high-profile elections (Gehlbach et al. (2010) and Wiwattanakantang & Bunkanwanicha (2009)). Nonetheless, a group of notorious billionaires assuming critical offices in the country administration is a phenomenon substantially different from the one studied in this article. That is better represented by small and medium-size entrepreneurs acting as regional politicians.

being prosecuted (Correia, 2014), higher chances of benefiting from a bailout (Faccio et al., 2006) or winning a public procurement (Baltrunaite (2020), Goldman et al. (2013) and Boas et al. (2014)). Moreover, sectors with a more substantial presence of connected companies tend to be favored by regulators (Faccio & Zingales, 2017).

In Brazil, campaign contributing businesses were more likely to receive credit from the national development bank (Tabajara, 2019). They also increased their reliance on bank finance (Claessens et al., 2008). Moreover, companies that donated to winning candidates receive larger values from governments contracts (Boas et al. (2014) and Araujo (2012)). These effects are stronger for parties with a longer legislative tradition (Arvate et al., 2019).

Across the globe, financial agents appear to have noticed this preferential treatment. Politically connected firm's stock returns vary accordingly to the electoral performance of the politician to whom they are connected (Ferguson & Voth (2008), Claessens et al. (2008) and Acemoglu et al. (2016)). Furthermore, consistently with rent-seeking objectives, connected companies and business owners' candidacies are more frequent in environments with weaker institutions and looser oversight (Faccio (2006), Li et al. (2006) and Gehlbach et al. (2010)). The effects of these policies on the economy are not fully understood. Nevertheless, there might be implications for economic growth and development; through misallocation of resources and impediments of the *creative destruction* process (Akcigit et al., 2018).

In addition, understanding what happens to mayor-owned companies while they hold office could be relevant for the voters. Knowing that someone running is likely to obtain private gains if elected could change a ballot. Citizens might, for example, worry to what extent this candidate is motivated by the prospect of financial gains instead of society enhancement objectives. In agency models (Persson et al. (2000) and Polo (1998)), this could be symbolized by imperfectly informed voters, and politicians with heterogeneous rent-seeking skills, in the spirit of Reed (1994).

A primary contribution of this article is the study of companies directly owned by politicians. It answers if mayor-owned businesses grew more than they would if their owner did not hold public office. The findings suggest those companies were approximately 25% larger than they would be if their owner had lost the elections.

This research built a unique data set of mayor-owned businesses spanning from 2004 to 2017. It was constructed from three administrative data sources on candidates, firm ownership, and a matched employer-employee base of formal employment contracts. Then, it utilized this information and a regression discontinuity (RD) design (Lee, 2008) to propitiate a causal interpretation of its findings It exploits quasi-random variation from elections decided by a thin margin to establish a relation of causality. The estimates rely on the comparison between firms from barely elected mayors and companies whose owners almost got elected. The idea is that the second group offers a credible counterfactual for the latter. One caveat of this strategy is that results do not necessarily extrapolate to companies owned by candidates that won the election by a large margin.

The remaining of this article is organized as follows. The following section explains the institutional context. It discusses the mayor's significant role in the public administration and how often business owners hold that position. The third section describes the data set used, discussing its advantages and limitations. Then, the chosen empirical strategy is detailed, and evidences of its suitability are presented. The following section presents the main results. Section six demonstrates that they are robust to alternate specifications. The seventh chapter discusses the possible mechanism sustaining the abnormal growth experienced by mayor-owned businesses. The last section concludes by indicating interesting pathways to advance the research on this topic.

2
Institutional Context

Brazil is one the largest democracies in the world, with almost 150 million people registered to vote (TSE, 2021). Corruption, however, is widespread. High-profile scandals are a constant in the country's history (Taylor, 2020; Power & Taylor, 2011), and small-scale bribery is prevalent. In 2010, 43 percent of the population reported having paid a bribe in the previous 12 months (Barometer, 2010). Not by coincidence, Brazil ranks 69 out of 170 in the corruption perception index of the NGO Transparency International (TI, 2010). [1] In addition, the Brazilian public sector is relatively large; its yearly expenses systematically exceeded 30% of its GDP, at least since 2010 (WB, 2021).[2] Therefore, business owners acting as elected officials in this environment might have the opportunity to engage in rent-seeking actives.

This article focuses on mayors that are responsible for municipalities' executive branches. Every four years, the population is called upon to define their next mayor and the composition of the local legislative; all representatives are elected for a four-year term. Those are high-stakes elections since the municipal governments provide essential public services, such as primary education and health care, free of charge. As a result, they are responsible for 58% of the nation's public workers (Lopez & Guedes, 2020) and 14% of the Government's expenditure (TN, 2021). [3]

Notice that even if mayors who own a business do not direct public expenditure to favor their companies, their enterprises may benefit from their owners' position. Someone could, for instance, buy products from them expecting to obtain political goodwill.[4] It is also possible that the firm profits from the extra media appearance due to its owner's new position.

[1] That is the Brazilian position in the 2010 report, which is in the middle of the period studied.

[2] This is the first year with available data.

[3] In 2020, municipal governments' expenses summed to approximately BRL 712 million (TN, 2021).

[4] In Italy, for example Berlusconi TV channel increased advertising revenue during his term (DellaVigna et al., 2016).

Illegal or not, it is likely that business owners consider the expected impact of running for office in their firms before offering their candidacy to the public. While positive effects could act as an incentive to run, negative ones would encourage them not to (Gehlbach et al., 2010). Voters, in their turn, could use this information to decide how to cast their votes.

Citizens are frequently called upon to decide if they want a business owner as their mayor. In the four elections between 2004 and 2016, 40.3% (2245) of the cities had at least one candidate with that profile, and 80.9% of them ended up as the most voted or second most voted candidate. As a result, 18.9% (1054) of the country's cities were run by a firm owner for at least four years between 2002 and 2020 (Figure 2.1).

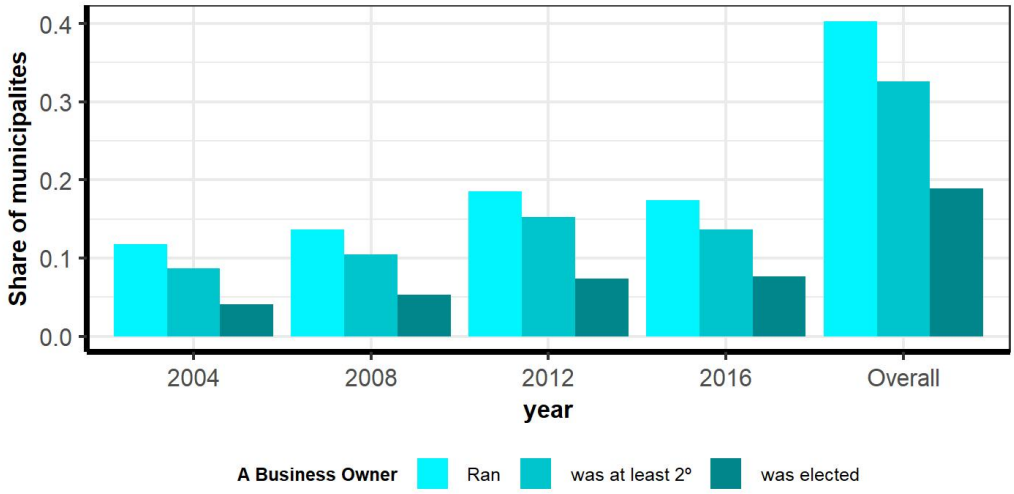


Figure 2.1: Share of Municipalities With a Business Owner Candidates

Note: This figure plots, for each election, the share of Brazilian municipalities that had at least one business owner as a candidate for mayor (light blue). The percentage of cities where they finish the race at least in second place is in regular blue. The municipalities where the business owner was elected are associated with dark blue. The fifth group of columns depicts the percentage of cities in any of these four elections that were part of the category.

As depicted in Figure 2.2, municipalities, where business owners ran for office, are, on average, wealthier and more populous than the medium Brazilian city. Notwithstanding that, more than one hundred firm owners were elected mayor in cities from each quintile of municipalities income and population distribution. In addition, those places are not spatially concentrated, as demonstrated by Figure 2.3. The phenomenon being studied, therefore, is not circumscribed to a particular type of municipality.

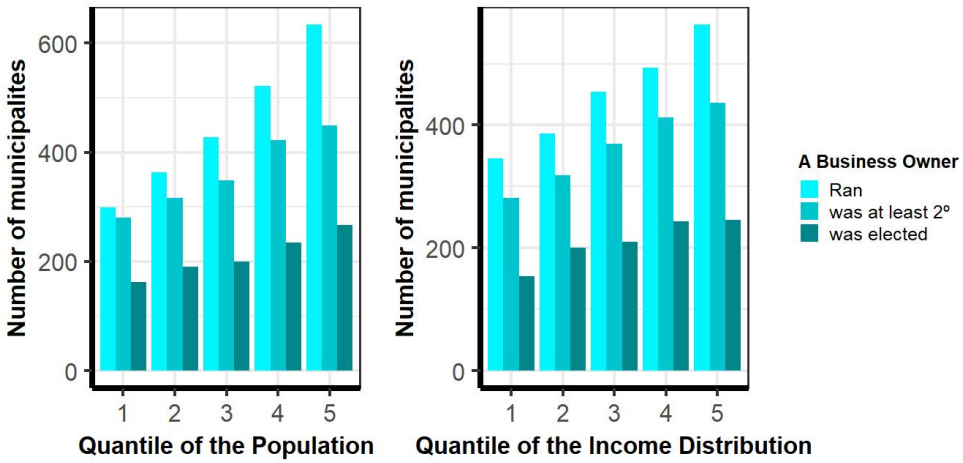


Figure 2.2: Municipalities With a Business Owner Candidates by Population and Income

Note: This figure plots the number of Brazilian municipalities with at least one business owner as a candidate for mayor (light blue) in each quintile of the population and income distribution. The percentage of cities where they finish the race at least in second place is in regular blue. The municipalities where the business owner was elected are associated with dark blue. Cities' population and income information are from the 2010 Census.

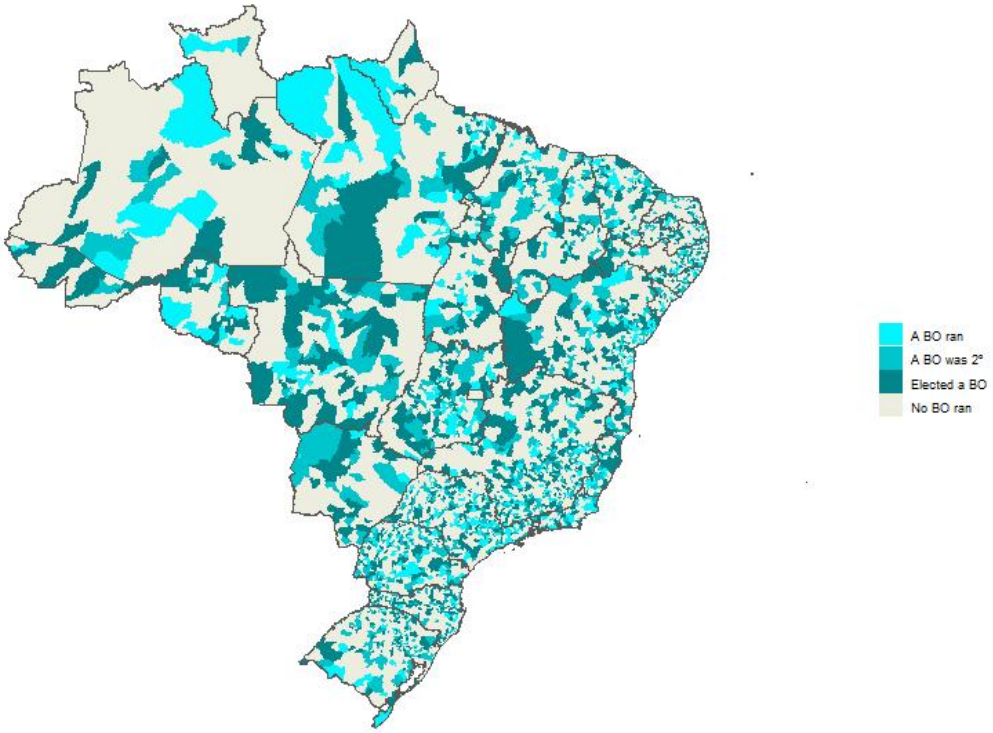


Figure 2.3: Municipalities with a Business Owner (BO) candidate

Note: This figure plots a Brazilian map coloring the municipalities with a business owner running for mayor in at least one of the following elections: 2004,2008,2012, or 2016. The lighter blue is associated with cities with at least one candidate that owns a business, and the darker one is reserved for places that elected a business owner as mayor. The other blue identifies regions where a business owner was the second most voted candidate for mayor in at least one of the four elections analyzed.

3
Data

This work builds upon three administrative data sources. One contains data on all candidates that ran for mayor between 2004 and 2016. Another depicts the ownership of all registered firms in April of 2020. A third encompasses information on all formal employment contracts from 2002 to 2017. If only representative samples were available, the likelihood of finding enough firms of interest to achieve some statistically significant conclusion would be negligible.

Information on all candidates, including their number of votes, complete name, and unique social identifier number (CPF), is available on Brazil's Federal Electoral Court website (TSE, 2020). The motivation figures presented in the previous section utilize data from the four municipal elections that happened between 2004 and 2016. The estimates, however, rely only upon three of those elections: 2004, 2008, and 2012. That is done because formal employment data is only available until 2017. Therefore, there are not enough years to study firms from politicians elected in the 2016 election.

Firm ownership data is obtained from the public registers of *Receita Federal*, the Brazilian tax authority, and includes the unique firm identifier, all partners' names, and partial social security number[1] and when they were registered as an owner. It is made available in ready-to-use format by "brasil.io" (Justen, 2020). It is worth noticing that this is a cross-section of firms that were registered on the 5^{th} of April of 2020. That means it does not include companies terminated before that date, which could lead to survival bias. Nonetheless, if having an owner serve as mayor increase the likelihood of surviving and improves firm outcomes, this work would likely estimate a lower bound of the actual effects.

The unique firm identifier (CNPJ) makes it possible to find those companies in the matched employer-employee administrative data set. The *Relação Anual de Informações Sociais* (RAIS) registers information on all formal work contracts, including the wage and some characteristics of the worker.

[1]Six out of the eleven numbers that compose the social security number are available.

Aggregating this data at the firm level, it is possible to infer how many people it employs, their average salary, their payroll, and other company characteristics. The blind spot of this administrative data set is the informal labor market.

From these three data sets, 3177 firms with owners that ran for mayor in 2245 cities across these three elections were identified. The objective was to focus on candidates that voters perceived as entrepreneurs while deciding their vote. This work, therefore, used only companies with at least two employees in the year before the election. Thus, it removed 1511 observations from the sample; 79% of those did not have any workers on their payroll before the election. Restricting the attention only to companies from winners and runners-ups further reduces the sample in 428 observations. More 285 firm-election pairs are discarded because they do not have at least one worker in all the six consecutive years from the one before the election until the end of the mayor's term or are associated with a mayor running for reelection.

The resulting data set has 936 observations at the firm-election level; each line represents a company in an election.[2] The characteristics of this data are presented in table 3.1. First, are presented firms' characteristics. Each year, the companies inform their number of employees and their monthly wage. [3] Thus, it is possible to calculate the average salary it paid and its payroll expenses per year. The values presented in the following table correspond to the average variable value across the four years of the term. [4] The number of people hired by the company throughout the mayor's term is presented under "Hiring." "Separations," on the other hand, represents the number of people that leave the company, for any reason, within the four years of the term. Then, variables about the educational attainment of the workforce are depicted. Under "At least 2ª education," it is the share of the workforce that attained a secondary or higher degree. The variable "At least 3ª education" is analogous.

In sequence, the table presents monotonic transformations of some of the variables mentioned above. From there on, it depicts the growth rate of some variables. They were defined as the difference between its mean value across the mandate and its value in the year before the election, divided by the latter. The following variables refer to the election disputed by the owner of the firm. First, their performance in the election is summarized by the "Vote

[2]There are 936 unique firms, but only 821 unique candidates. Seven hundred twenty-one candidates had only one firm, 86 had two, 13 had three, and one had four companies.

[3]The number of employees and their wage informed in *RAIS* refers to December.

[4]The values in BRL are deflated to 2010.

Margin"[5] and "Vote Share" variables. Then the "Election year" requires no explanation, and the "South or Southeast" variable indicates if the election was held in Brazil's South or Southeast regions.

The last four variables are used as proxies for the quality of each municipalities' institutions. "AM Radio" and "Internet" indicate, respectively, if the city had an AM radio or an internet provider in the year the firm's owner disputed the election.[6] "Judicial District" punctuates if the city has a state court or needs to settle its disputes in a nearby town. The "Governance Index" indicates the municipality's government administrative capacity Naritomi et al. (2012).

[5]As defined in section 3

[6]For companies whose owner disputed the 2012 election, variables refer to the first year of the term for data availability reasons.

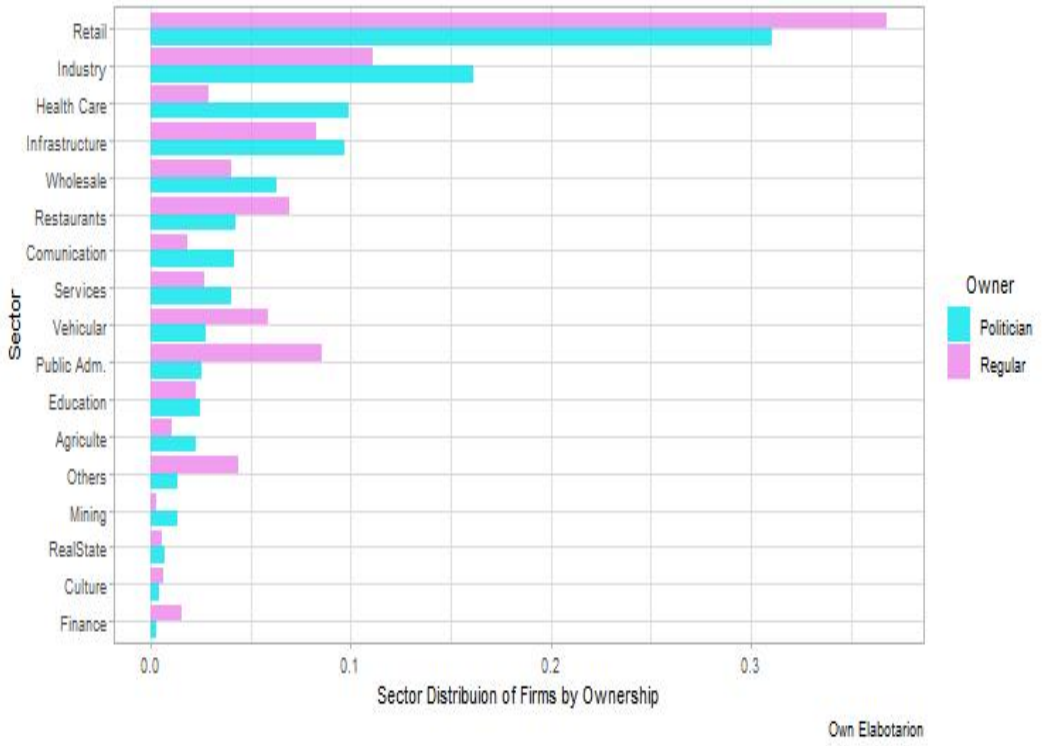
Table 3.1: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
Number of Employees	936	17.701	32.590	4	8.2	18.2
Payroll Cost (BRL)	936	16,869	41,967	3,099	6,783	15,662
Average Wage (BRL)	936	872.120	390.372	651.834	793.004	993.587
Hiring	936	24.377	49.666	3	8	22
Separations	936	25.533	57.125	3	9	23
At least 2ª education	936	0.562	0.325	0.3	0.6	0.9
At least 3ª education	936	0.097	0.182	0	0.01	0.1
ln Number of Employees	936	2.191	1.100	1.386	2.110	2.904
ln Payroll Cost	936	8.889	1.222	8.039	8.822	9.659
ln Average Wage	936	6.697	0.377	6.480	6.676	6.901
IHS Hirings	936	2.774	1.544	1.8	2.8	3.8
IHS Separations	936	2.879	1.457	1.818	2.893	3.829
Employees growth rate	936	0.319	2.768	−0.219	0.042	0.357
Payroll growth rate	935	0.560	3.693	−0.105	0.205	0.622
Average Wage growth rate	935	0.182	0.225	0.067	0.162	0.270
Vote Margin	936	−0.006	0.097	−0.060	−0.011	0.045
Vote Share	936	0.461	0.110	0.391	0.463	0.524
Election Year	936	2,008.650	3.369	2,004	2,008	2,012
South or Southeast	936	0.525	0.500	0	1	1
AM Radio	936	0.580	0.494	0	1	1
Internet	936	0.692	0.462	0	1	1
Judicial District	936	0.733	0.443	0	1	1
Governance Index	926	3.604	0.827	3.075	3.675	4.169

Note: This table presents descriptive statistics for a sample of firms whose owners finish first or second in an election for mayor. The variables represented follow the definitions presented in section 3, except "Vote Margin," defined in section 4.

It is worth noticing that the typical firm owned by the mayor candidates is not enormous. Fifty percent of the enterprises have less than 8.2 workers, consistently with the sector distribution of the candidates' firms. In Figure 3.1, it is possible to see that most of the politician-owned businesses are in the retail, industry, healthcare, and infrastructure sectors; combined, they respond for 67 percent of the firms studied. The prominent role of the healthcare sector highlights how different the sector composition of politician-owned enterprises is from the one of the general population of firms. All in all, mayor candidates owns a broad set of business. There are industrialists among the candidates, but also owners of restaurants and shops.

Figure 3.1: Sector distribution of Firms by Ownership



Note: This graph portrays the share of firms in each sector according to their ownership. In blue are represented the companies owned by a mayor or runner-up candidate. Businesses without any politician registered as partners are in pink. This information is obtained from a random sample of the firms from cities where a business owner finished first or second in an election for mayor between 2004 and 2016. The mapping between CNAE code and sector is depicted in Table 9.1 in the appendix.

Table 3.2 presents the same descriptive statistics as Table 3.1, but according to the election's result and competitiveness. The left panel considered all the 936 observations, while the one in the right utilizes only firms whose owner won or lost the election by a narrow margin. Besides the average value of the variables, each panel presents the p-value of the difference between them. This simple exercise already suggests that, during the mandate, mayor-owned companies had more employees and spent more with them, on average and in aggregate. [7]

[7]It is worth noticing that this is not a balance test, the presented variables are supposed to be affected by the election outcome. A balance test is presented in Table 4.1.

Table 3.2: Descriptive Statistics by Election Result and Competitiveness

	All Elections			Close Elections		
	Mayors's Firms	Runner-up's Firms	p-value	Mayors's Firms	Runner-up's Firms	p-value
Number of Employees	19.36 (38.91)	16.37 (26.40)	0.181	21.76 (46.59)	15.96 (23.24)	0.072
Payroll Cost (BRL)	18793 (49900)	15323 (34264)	0.227	20707 (59421)	13853 (22428)	0.084
Average Wage (BRL)	900.58 (427.65)	849.25 (356.40)	0.050	873.75 (347.14)	835.50 (346.65)	0.194
Hiring	24.28 (51.29)	24.46 (48.37)	0.957	26.08 (59.27)	24.54 (49.13)	0.741
Separations	26.03 (65.10)	25.13 (49.86)	0.816	29.26 (79.68)	24.09 (48.08)	0.366
At least 2ª education	0.54 (0.32)	0.58 (0.33)	0.133	0.52 (0.32)	0.58 (0.32)	0.045
At least 3ª education	0.10 (0.18)	0.09 (0.18)	0.620	0.11 (0.19)	0.09 (0.18)	0.401
ln Number of Employees	2.25 (1.12)	2.15 (1.08)	0.158	2.29 (1.17)	2.14 (1.07)	0.113
ln Payroll Cost	8.98 (1.22)	8.82 (1.22)	0.052	9.01 (1.25)	8.80 (1.17)	0.048
ln Average Wage	6.73 (0.36)	6.67 (0.38)	0.021	6.71 (0.33)	6.66 (0.38)	0.056
IHS Hirings	2.81 (1.51)	2.75 (1.57)	0.548	2.79 (1.57)	2.79 (1.52)	0.978
IHS Separations	2.94 (1.41)	2.83 (1.50)	0.238	2.93 (1.48)	2.84 (1.45)	0.496
Employees growth rate	0.19 (0.96)	0.42 (3.62)	0.174	0.21 (0.96)	0.55 (4.63)	0.208
Payroll growth rate	0.40 (1.01)	0.68 (4.88)	0.203	0.41 (0.94)	0.82 (6.24)	0.254
Mean Wage growth rate	0.19 (0.23)	0.17 (0.22)	0.250	0.19 (0.21)	0.17 (0.23)	0.338
Vote Margin	0.07 (0.07)	-0.07 (0.06)	<0.001	0.03 (0.02)	-0.03 (0.02)	<0.001
Vote Share	0.54 (0.09)	0.40 (0.08)	<0.001	0.49 (0.06)	0.44 (0.06)	<0.001
Election Year	2008.41 (3.34)	2008.84 (3.38)	0.053	2008.46 (3.28)	2008.70 (3.40)	0.395
South or Southeast	0.52 (0.50)	0.53 (0.50)	0.922	0.48 (0.50)	0.50 (0.50)	0.582
AM Radio	0.59 (0.49)	0.57 (0.50)	0.498	0.60 (0.49)	0.56 (0.50)	0.284
Internet	0.70 (0.46)	0.69 (0.46)	0.852	0.71 (0.45)	0.69 (0.46)	0.626
Judicial District	0.72 (0.45)	0.74 (0.44)	0.592	0.72 (0.45)	0.74 (0.44)	0.625
Governance	3.62 (0.82)	3.59 (0.84)	0.641	3.62 (0.81)	3.59 (0.83)	0.637

Note: This table presents average values and standard errors of firm characteristics by their owners result in the last election. The third column of each panel depicts the p-value of the difference between the averages of the two groups. The left panel reports this exercise for all 936 firms analyzed, while the right includes only companies involved in a close election. Including, therefore, mayor-owned companies associated with vote margins smaller than .07 and runner-up enterprises with a vote margin higher than -.05.

4
Empirical Strategy

To evaluate what happens with a firm whose owner is elected, one cannot simply compare it with the other companies. It is necessary to find a suitable comparison group. Comparing mayor-owned businesses with enterprises from runner-up candidates could provide a more accurate counterfactual, but it would hardly suffice.

It is likely that the politicians that got elected also managed their firms differently than the business owners that lost the election. That could happen if, for instance, people are more likely to select someone they consider a better entrepreneur. Thus, merely comparing mayor-owned firms with other ones owned by runner-up candidates could lead to incorrect conclusions.

Nevertheless, business owners who barely got elected are likely to be similar to those who almost became mayors; as a result, so should be their firms. One could, thus, apply an RD design to estimate the impact of having an owner elected mayor (Lee & Lemieux, 2010). To calculate the associated estimate, a variable that indicates the competitiveness of each election is necessary. The $VoteMargin_{it}$ of a given business i in an election t fulfills this role; it is defined as follows:

$$VoteMargin_{it} = \frac{v_{it} - 0.5(v_{1t} + v_{2t})}{(v_{1t} + v_{2t})} \tag{4-1}$$

Where v_{it} is vote share of the owner of firm i in the election t, v_{1t} is the vote share of the winning candidate in that election and v_{2t} is the vote share of second place. Note that $v_{it} = v_{1t}$ or $v_{it} = v_{2t}$, as a result, the elected mayor's firm is associated with a positive $VoteMargin_{it}$, while the one owned by a runner-up is associated with negative values.

The RD method only correctly identifies the effects of having an owner elected near the cutoff value of zero (Lee & Lemieux, 2010). The parameter estimated, therefore, is the impact of having an owner barely elected mayor.

Equation (4-2) mathematically represents a local average treatment effect (LATE). The outcome of interest of company i, whose owner ran for mayor in the election t, is symbolized by y_{it} and the impact of the owner's election in this outcome by τ.

$$\tau = \lim_{m \to 0^+} E(y_{it}|VoteMargin_{it} = m) - \lim_{m \to 0^-} E(y_{it}|VoteMargin_{it} = m) \quad (4\text{-}2)$$

To estimate the population parameter above, first, one should subset the data, including only firms associated with a vote margin whose absolute value is sufficiently close to zero. The optimal distance to use as bandwidth is defined accordingly to the minimum squared error (mse) criteria (Calonico et al., 2014). Then, with the remaining observations, the following linear regression yields a consistent estimate of τ.

$$y_{it} = \alpha + \tau T_{it} + \mu_l VoteMargin_{it} + \mu_r T_{it} VoteMargin_{it} + Z'_{it}\gamma + v_{it} \quad (4\text{-}3)$$

Where y_{it} is a firm outcome, such as the log of the number of employers, T_{it} is a dummy variable indication if $VoteMargin_{it} > 0$ and Z_{it} is a vector of control variables, that includes election fixed effects and firm characteristics before the election. [1] Observations are weighed with a triangular kernel, and the optimal bandwidth is chosen accordingly to the minimum squared error (mse) criteria proposed by Calonico et al. (2014), allowing for different values below and above the cutoff.

There is a trade-off between higher and lower degree polynomial specifications. Second or third-degree polynomials provide an overall better fit but amplify distortions near the cutoff. This work relies on first-order specifications not adjusted by the robust bias correction method proposed Calonico et al. (2014).[2]

It is worth noticing that this work compares firms whose owners obtained different electoral results. The treatment group comprises mayor-owned enterprises, and the control is formed of companies from almost victorious runner-up candidates. Therefore, the business owners are not necessarily competing against each other, nor in the same city.

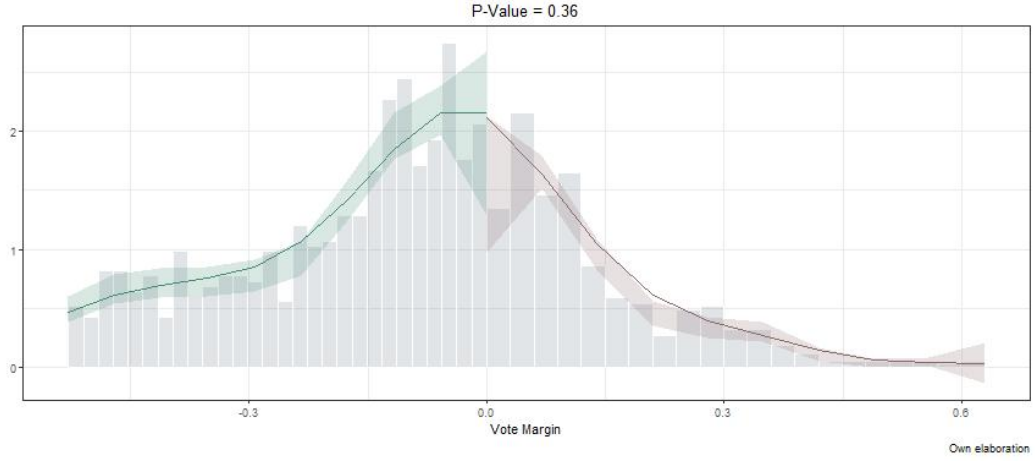
The core hypothesis supporting the use of the RDD is that if an election

[1] The mains specification controls for firm size, payroll, education of the workforce, and the number of hiring and separations in the year before the election.

[2] The bias-adjusted estimates are in line with the ones presented in this dissertation and are available upon request.

is competitive enough, who wins it is as good as random. If that is true, the number of firms whose owners barely got elected should be similar to those owned by almost selected runner-up candidates. The following figure plots the result of a McCrary test developed to test exactly this (McCrary, 2008). [3] It tries to reject the hypothesis that the number of firms is equal on both sides of the discontinuity, but it does not. Therefore, this exercise provides evidence in favor of the quasi-random outcome of the close elections considered.

Figure 4.1: Test for Manipulation of the Running Variable



Note: This figure plots a nonparametric regression to each half of the distribution following McCrary (2008), trying to reject a continuity at zero. The p-value of this test is at the top of the graph.

Another consequence of quasi-random outcomes in close elections is that companies from runner-up candidates should be similar to those owned by an elected mayor before the election. That is also testable, as one can estimate equation (4-3), using firm outcomes from the year before their owners ran for office as the dependent variable. Table 4.1 presents an owner's election's estimated impact on firm outcomes one year before the office dispute. Close to zero and insignificant estimates reinforce that mayor-owned businesses were not different from runner-up enterprises before the election.

Each line of Table 4.1 corresponds to a characteristic of the firm, and the columns are associated with different specifications of the estimate. The first three control only for year fixed effects, while the other three control for firm characteristics in the previous year. [4] The specifications that use the mse

[3]The McCrary test was implemented using an R package developed specifically for this purpose(Cattaneo et al., 2018).

[4]It could be helpful to think in the scenario with only one election in 2004; then, this exercise would regress the firm's characteristics in 2003 on the vote margin of their owners in 2004, controlling for year fixed effects and their enterprise characteristics in 2002.

optimal bandwidth are identified with "CCT" in the headline; there are also presented estimates using half of it (".5CCT") and the double of it ("2CCT").

The coefficients are, in general, small in magnitude and statistically indistinguishable from zero. There are a few significant results, but none when controlling for the firm characteristics. In addition, these estimates were not adjusted for False Discovery Ratio (Benjamini & Hochberg (1995) and Benjamini & Yekutieli (2005)). Therefore, this balance test suggests that runner-up candidates' firms were similar to those owned by mayors before the election.

Table 4.1: Falsification Test:
Impact of an Owner's Election on Firm's Baseline Characteristics

	Regression Discontinuity Estimates:					
Dependent Variable	One year before the election					
	.5CCT	CCT	2CCT	.5CCT	CCT	2CCT
ln Employees	0.22	0.28*	0.12	-0.01	0.02	0.01
	(0.22)	(0.16)	(0.12)	(0.13)	(0.08)	(0.06)
Employees growth rate	-0.07	-0.02	-0.02	-0.04	-0.01	0.00
	(0.11)	(0.08)	(0.06)	(0.09)	(0.07)	(0.06)
ln Payroll	0.20	0.06	0.04	-0.05	-0.01	0.00
	(0.25)	(0.17)	(0.13)	(0.14)	(0.08)	(0.06)
Payroll growth rate	-0.13	-0.05	-0.04	-0.10	-0.03	-0.01
	(0.12)	(0.08)	(0.07)	(0.10)	(0.08)	(0.06)
ln Average Wage	0.14*	0.05	0.04	-0.01	-0.02	0.00
	(0.08)	(0.06)	(0.04)	(0.06)	(0.04)	(0.03)
Average Wage growth rate	-0.01	-0.02	-0.01	0.00	-0.02	-0.01
	(0.03)	(0.02)	(0.01)	(0.03)	(0.02)	(0.01)
ihs Hirings	0.60**	0.41**	0.23	0.10	0.19	0.11
	(0.25)	(0.20)	(0.16)	(0.19)	(0.14)	(0.11)
Hirings growth rate	-0.02	-0.05	-0.07	-0.02	-0.05	-0.05
	(0.11)	(0.09)	(0.07)	(0.09)	(0.07)	(0.06)
ihs Separations	0.55**	0.18	0.12	0.16	-0.02	0.01
	(0.27)	(0.19)	(0.15)	(0.16)	(0.11)	(0.09)
Separations growth rate	0.12	0.04	-0.02	0.07	0.02	-0.04
	(0.12)	(0.08)	(0.05)	(0.11)	(0.07)	(0.05)
At least 2^a Educ. (%)	-0.04	-0.05	-0.04	0.00	-0.01	-0.02
	(0.08)	(0.06)	(0.04)	(0.03)	(0.02)	(0.02)
At least 3^a Educ. (%)	0.04	0.04	0.04**	0.00	0.01	0.01
	(0.04)	(0.03)	(0.02)	(0.02)	(0.02)	(0.01)
Year FE	YES	YES	YES	YES	YES	YES
Firm Characteristics	NO	NO	NO	YES	YES	YES

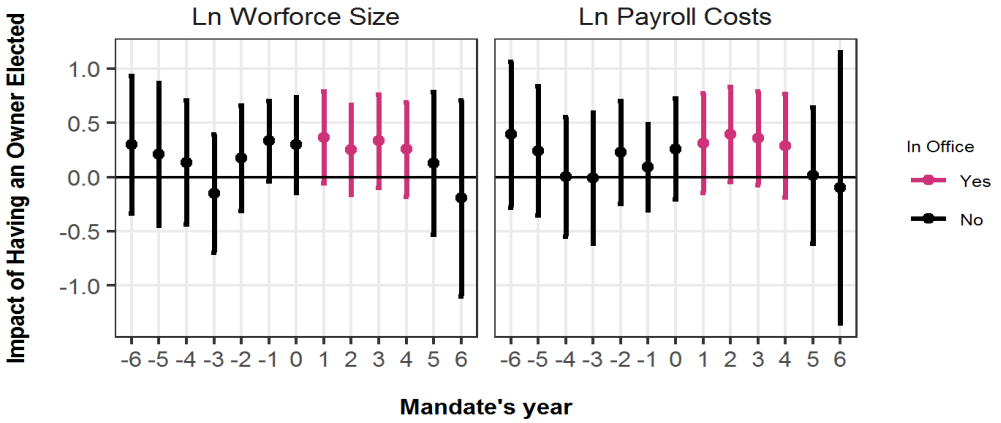
*p<0.1; **p<0.05; ***p<0.01

Note: This table reports the point estimates and standard errors of the impact of having an owner elected mayor in the year before the election. Each line uses a different outcome variable. The first three columns do not control for firm characteristics in the year before the election; the last three do. Within each group of 3 columns, the second uses the optimal bandwidth; the first employs half of it, and the third doubles it.

Table 4.1 compares firms from winners and runner-up candidates in one moment in time, the year immediately before the election. Nonetheless, even

companies that appear to be similar in a given moment in time might be in different trajectories. To test this hypothesis, one could estimate the equation (4-3) using as dependent variable firm's characteristics in a set of years before the election. Figure 4.2 exposes this test for the company's workforce size and payroll expenses. This exercise does not suggest that mayor-owned businesses were on a different trajectory than companies from runner-up candidates before the election.[5]

Figure 4.2: Pre-trends test for the Regression Discontinuity Estimate



Note: This figure plots the estimated impact of having an owner elected in the firm's outcomes in different years. The election-year is represented by 0 at the horizontal axis. Negative values are associated with the years before the election, and positive ones correspond to the years after the election. Each point corresponds to one estimate and its 95 percent confidence interval. All specifications control for election fixed effects and employ the CCT optimal bandwidth. The left panel utilizes the log of the average number of employees during the elected mayor's term as the dependent variable. While the right one employs the log of the firm's average payroll as such. The effects in the mandate's years are presented in pink.

[5]This result does not change if the pre-trends are tested with a two-way fixed-effects model, as depicted by figures 9.1 and 9.2 of the appendix.

5
Results

The tests presented in the previous section reinforce that firms owned by almost elected candidates provide a suitable counterfactual to business from barely elected mayors. Therefore, it is possible to obtain a consistent estimate of the effect of an owner's election on company performance with an RD approach. The preferred specification indicates an increase of approximately 25 percentage points in its workforce size and payroll expenses. [1]

This estimate is presented in Table 5.1. The first three columns use the log of the average number of workers across the four years of the mayor's term as the dependent variable. The others utilize the log of the average payroll expenses on the same period. Estimates with the MSE optimal bandwidth, half of it and the double of it, are presented for both performance proxies.

All estimates provide evidence of an increase in firm growth during their owner term. This effect is statistically significant and economically meaningful. While firms from runner-up candidates employ, on average, 8.33 workers at the cost of R$ 6.500, the owner's election effects alone would increase it to 10.8 employees receiving R$ 8520 in total.

[1] Payroll expenses are estimated by multiplying the number of employees in December by their average wage.

Table 5.1: Impact of an Owner's Election on Firm Performance

	Dependent variable:					
	ln Employees			ln Payroll		
	(1)	(2)	(3)	(4)	(5)	(6)
Owner's Election	0.28*	0.26***	0.13*	0.33**	0.24***	0.11
	(0.15)	(0.10)	(0.07)	(0.13)	(0.09)	(0.07)
bw_l	0.02	0.05	0.09	0.03	0.06	0.12
bw_r	0.03	0.07	0.13	0.03	0.07	0.13
N_l	113	218	372	158	273	421
N_r	144	254	334	139	244	323
N	257	472	706	297	517	744
Runner-up Mean	1.96	2.12	2.10	8.83	8.81	8.79
sd	1.02	1.02	1.01	1.06	1.08	1.08
bw	.5CCT	CCT	2CCT	.5CCT	CCT	2CCT
Baseline Char.	YES	YES	YES	YES	YES	YES
Election FE	YES	YES	YES	YES	YES	YES

*p<0.1; **p<0.05; ***p<0.01

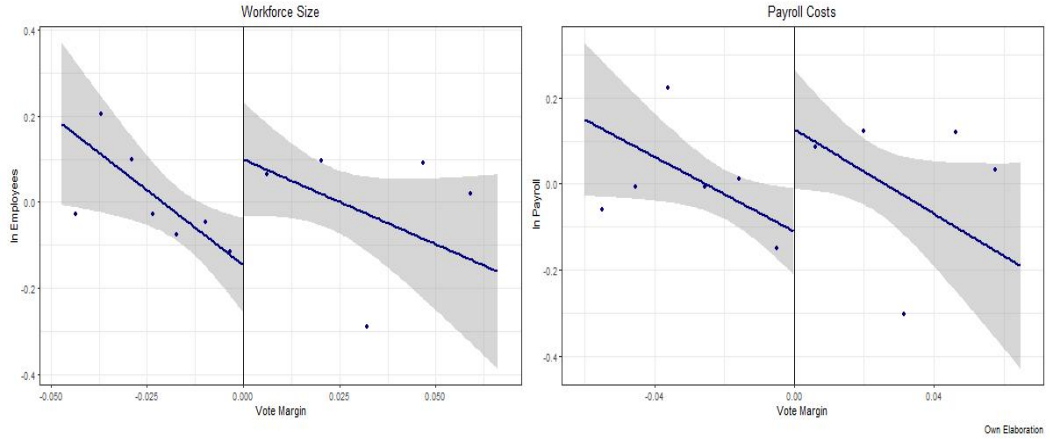
Note: This table reports the point estimates and standard errors of the estimated impact of having an owner elected mayor for six specifications of equation (4-3). Besides the main effects, it depicts details about each regression. The bw_l and bw_r compose the bandwidth used, such that only firms associated with a vote margin within the interval $(-bw_l, bw_r)$ are considered. Then the number of observations used associated with a loser (N_l) and winner (N_r) candidates, as well as its sum (N), are reported. "Runner-up Mean" is the average value of the dependent variable among companies of candidates that lost the election. The "sd" represents the standard deviation of the dependent variable. The "bw" parameter indicates if the mse optimal bandwidth was used (CCT), half of it (.5CCT), or its double (2CCT). Then "Baseline Char." and "Election FE" punctuate if controls for firm baseline characteristics and election fixed effects were utilized. The first three columns use the log of the number of employees as the dependent variable, while the others use the log of the payroll expenses.

One source of bias the RD strategy does not address is the informal labor market. In Brazil, it is relevant in the intensive margin, with businesses operating without register, and in the extensive margin, with formalized companies informally hiring part of their workforce (Ulyssea, 2018). This could become a threat to identification assumption if runner-up companies

keep hiring from the informal market, but the mayors' firms do not.

Another form of depicting the same results presented in the table above is the couple of graphs in Figure 5.1. The x-axis portrays the vote margin variable as explained in chapter 3; the y axis represents the firm performance, measured by its workforce size or payroll expenses. The blue line represents the estimated value of the company performance variable accordingly to the vote margin of their owner. In general, the relation is negative, consistent with the politician experiencing a trade-off. The more time they spend in politics, the worst his business performs. Nevertheless, this relation changes right at the discontinuity, between firms whose owner became a mayor and those owned by a runner-up candidate. The discontinuity at zero is a visual representation of the results in columns (2) and (5) of the table above.

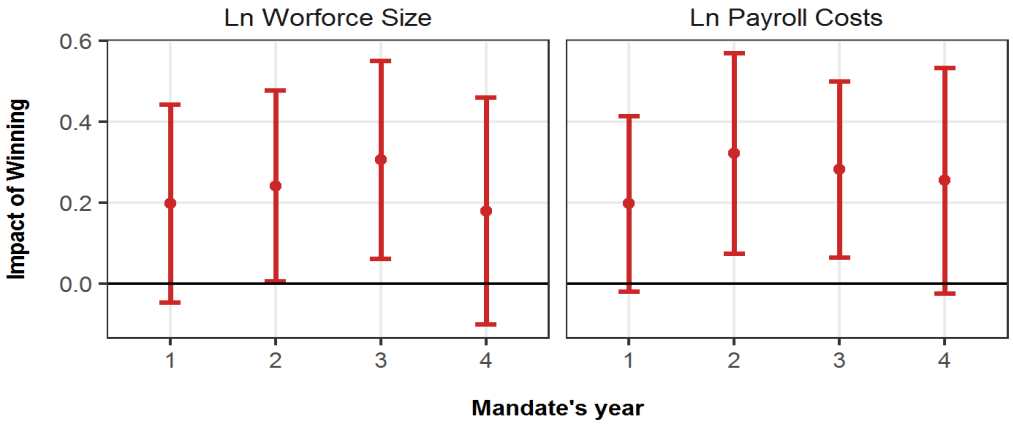
Figure 5.1: Effects of the Owner's Vote Margin on Firm Performance



Note: Each panel in this figure plots a linear regression of the measures of firm performance on the vote margin of the business owner, controlling for year fixed effects and baseline characteristics. The estimations are calculated separately for positive and negative values of the vote margin. The first group is associated with mayor-owned enterprises, and the latter is composed of companies from runner-up candidates. The 95% confidence interval of the fit is reported as a shaded area around the fitted curve. The data is separated into evenly spaced bins; the points represent the average value of the dependent variable in that bin. The left panel uses the log of the firm's number of employees to measure its performance. While the right panel uses the log of the company's payroll.

So far, only the average results throughout the mayor's mandate have been discussed. Figure 5.2 suggests pathways to understand the dynamics of those effects. It plots the impact of having an owner serving as mayor in each year of the term. The point estimate suggests the effects increase during the mandate. However, the confidence intervals are too large to statistically differentiate the impact in one year from another.

Figure 5.2: Impact of the Owner's Election on Firm Performance by Mandate's Year



Note: This figure plots the estimated $\hat{\tau}$ for different specifications of equation (4-3), varying the dependent variable. Each point corresponds to one specification and its 95 percent confidence interval. The left panel utilizes the log of the firm's number of employees in different years of the elected mayor term as the dependent variable. The estimates associated with the number one in the x-axis use as dependent variable the number of workers of the firm in the first year of the mandate. The other numbers of the horizontal axis represent specifications that utilize the number of employees in the respective year of the term as the dependent variable. All estimates employ the mse optimal bandwidth (Cattaneo et al., 2019). The right panel is analogous to the one on the left but utilizes the firm's payroll as the dependent variable.

One feature of the figure above is that the estimates of the fourth year are more volatile than the others. That is consistent with the institutional design of reelections in Brazil. All the elected firm owners considered could have run for reelection. As the labor market data is from December, the municipalities will have already defined the next mayor in the fourth year. This means that the business owners studied can be in three different situations. Some will have been re-elected, others will have lost the election, and a third group may not even have run for a second term. The estimates associated with the fourth mandate year, therefore, reflect this variability with large confidence intervals.

6
Robustness test

This section aims to convince the reader that the key results presented are robust. First, the equation (4-3) is estimated again with three different specifications. One will use growth rates instead of log variables, another includes all barely elected candidates regardless of their position in the election, and a third does not exclude outliers. Then, the impact of an owner's election on the firm performance is estimated using a simple two-way fixed-effect model.

The decision to proxy a firm's performance with the log variables brings some advantages. The number of employees and the total payroll costs varies significantly between companies. Using the log of these variables approximates the distance between them. Avoiding, therefore, that large enterprises disproportionately impact the estimates. Using growth rates goes a step further. A 20 percent increase in a small firm's workforce has the same influence as it would have in a large one.

Both ways to measure firm performance have their advantages and limitations. Therefore, it is reassuring to see that utilizing the growth rates does not substantially change the results. Table 6.1 presents these estimates using the same structure of table 5.1. It provides evidence that large companies do not drive the main results. The coefficients are of similar magnitude and significant at the 10 percent level. The precision of the estimates is smaller, as expected, without the use of baseline characteristics as controls.[1]

[1]In this exercise, controls for baseline characteristics are not utilized because one of them is employed to construct the dependent variable. For instance, the employees' growth rate depends on the number of employees before the election.

Table 6.1: Impact of an Owner's Election on Firm Performance: Measuring It With Growth Rates

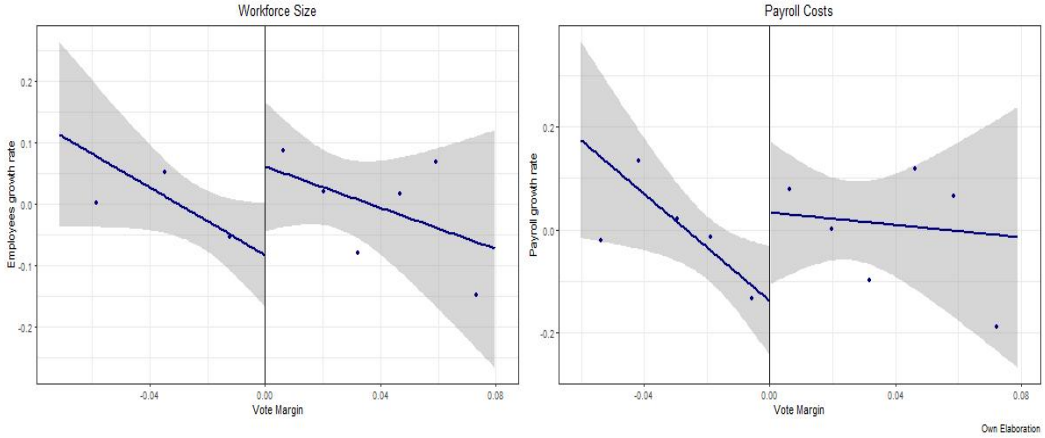
	Dependent variable:					
	Employees growth rate			Payroll growth rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Owner's Election	0.24*	0.15*	0.11*	0.28*	0.19*	0.13
	(0.12)	(0.08)	(0.06)	(0.16)	(0.11)	(0.08)
bw_l	0.04	0.07	0.14	0.03	0.06	0.12
bw_r	0.04	0.08	0.16	0.04	0.08	0.16
N_l	171	316	443	155	268	416
N_r	163	278	363	160	278	356
N	334	594	806	315	546	772
Runner-up Mean	0.09	0.11	0.13	0.24	0.29	0.32
sd	0.47	0.47	0.49	0.59	0.59	0.63
bw	.5CCT	CCT	2CCT	.5CCT	CCT	2CCT
Baseline Char.	NO	NO	NO	NO	NO	NO
Election FE	YES	YES	YES	YES	YES	YES

*p<0.1; **p<0.05; ***p<0.01

Note: This table reports the point estimates and standard errors of the estimated impact of having an owner elected mayor for six specifications of equation (4-3). Besides the main effects, it depicts details about each regression. The bw_l and bw_r compose the bandwidth used, such that only firms associated with a vote margin within the interval $(-bw_l, bw_r)$ are considered. Then the number of observations used associated with a loser (N_l) and winner (N_r) candidates, as well as its sum (N), are reported. "Runner-up Mean" is the average value of the dependent variable among companies of candidates that lost the election. The "sd" represents the standard deviation of the dependent variable. The "bw" parameter indicates if the mse optimal bandwidth was used (CCT), half of it (.5CCT), or its double (2CCT). Then "Baseline Char." and "Election FE" punctuate if controls for firm baseline characteristics and election fixed effects were used. The first three columns utilize the growth in the number of employees as the dependent variable. In contrast, the others use the growth in the payroll expenses.

The estimate of the above table has a graphical representation as well. The figure below represents the coefficients of columns (2) and (5). Analogously to Figure 5.1, the graphs below reinforce the results presented in Table 6.1.

Figure 6.1: Effects of the Owner's Vote Margin on Firm Performance: Measuring It With Growth Rates



Note: Each panel in this figure plots a linear regression of the measures of firm performance on the vote margin of the business owner, controlling for year fixed effects and baseline characteristics. The estimations are calculated separately for positive and negative values of the vote margin. The first group is associated with mayor-owned enterprises, and the latter is composed of companies from runner-up candidates. The 95% confidence interval is reported as a shaded area around the fitted curve. The data is separated into evenly spaced bins; the points represent the average value of the dependent variable in that bin. The left panel uses the log of the firm's number of employees to measure its performance. While the right panel uses the log of the company's payroll.

Mayor elections in Brazil have two formats. In cities with more than 200,000 electors, there can be two rounds. In the first one, all candidates compete and, if none receives more than fifty percent of the votes, there is a runoff between the two most voted candidates. Otherwise, the most voted candidate is elected. In the other municipalities, there is not a second round. Therefore, the most voted candidate is elected regardless of their vote share. Consequently, elections in Brazil can have more than two candidates with similar and real chances of getting elected.

The main specification considered only the two most voted candidates. [2] This allows for a clear-cut comparison between the number of companies just above or below the cut-off, which is instrumental for the continuity test presented in figure 4.1. There is, however, no reason to think that enterprises from third place candidates do not offer a reasonable counterfactual for the business of elected mayors if, for example, all candidates received around 33% of the votes.

[2]In cities where a runoff happened, those are two considered. Thus, if two contestants received a similar number of votes in the first round, but one pulled ahead on the runoff, this is not considered a close election.

The following table and figure present the estimates of the impact of having an owner elected mayor on firm performance using this broader definition of a close election. Not only are companies owned by second places candidates used as controls, but also any enterprises owned by any contestant that achieved a vote share sufficiently similar to the elected mayor. As expected, the coefficients are comparable in magnitude, indicating that the focus on the two most voted contestants does not jeopardize the results.

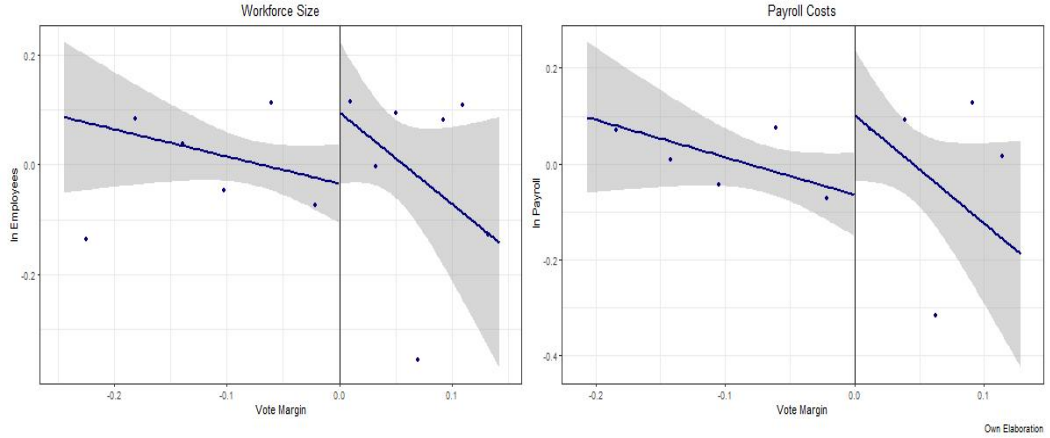
Table 6.2: Impact of an Owner's Election on Firm Performance: Including Other Competitive Candidates

	Dependent variable:					
	ln Employees			ln Payroll		
	(1)	(2)	(3)	(4)	(5)	(6)
Owner's Election	0.26**	0.13	0.06	0.31***	0.17**	0.06
	(0.12)	(0.08)	(0.06)	(0.12)	(0.08)	(0.07)
bw_l	0.12	0.25	0.49	0.10	0.21	0.42
bw_r	0.07	0.14	0.29	0.06	0.13	0.26
N_l	314	508	721	259	455	655
N_r	153	265	349	137	246	325
N	467	773	1070	396	701	980
Control Mean	2.10	2.07	2.10	8.84	8.80	8.79
sd	1.01	1.02	1.01	1.09	1.09	1.11
bw	.5CCT	CCT	2CCT	.5CCT	CCT	2CCT
Baseline Char.	YES	YES	YES	YES	YES	YES
Election FE	YES	YES	YES	YES	YES	YES

*p<0.1; **p<0.05; ***p<0.01

Note: This table reports the point estimates and standard errors of the estimated impact of having an owner elected mayor for six specifications of equation (4-3). Besides the main effects, it depicts details about each regression. The bw_l and bw_r compose the bandwidth used, such that only firms associated with a vote margin within the interval $(-bw_l, bw_r)$ are considered. Then the number of observations used associated with a loser (N_l) and winner (N_r) candidates, as well as its sum (N), are reported. "Runner-up Mean" is the average value of the dependent variable among companies of candidates that lost the election. The "sd" represents the standard deviation of the dependent variable. The "bw" parameter indicates if the mse optimal bandwidth was used (CCT), half of it (.5CCT), or its double (2CCT). Then "Baseline Char." and "Election FE" punctuate if controls for firm baseline characteristics and election fixed effects were used. The first three columns utilize the log of the number of employees as the dependent variable. In contrast, the others use the log of the payroll expenses.

Figure 6.2: Effects of the Owner's Vote Margin on Firm Performance: Including Other Competitive Candidates



Note: Each panel in this figure plots a linear regression of the measures of firm performance on the vote margin of the business owner, controlling for year fixed effects and baseline characteristics. The estimations are calculated separately for positive and negative values of the vote margin. The first group is associated with mayor-owned enterprises, and the latter is composed of companies from runner-up candidates. The 95% confidence interval is reported as a shaded area around the fitted curve. The data is separated into evenly spaced bins; the points represent the average value of the dependent variable in that bin. The left panel uses the log of the firm's number of employees as a proxy of its performance. While the Right panel utilizes the log of the company's payroll.

The RAIS database is dependent on employees providing the information and cannot be cross-checked by the government. Thus, significant variations in the performance metrics can result from an actual change or measurement error. Therefore, companies associated with the two highest percentile of the used measure are not considered in the main specification. This reduces noise, providing more accurate estimates of the effect of having an owner elected mayor. Nonetheless, including the removed observations do not change the results substantially, as exposed in Table 6.3 and Figure 6.3.

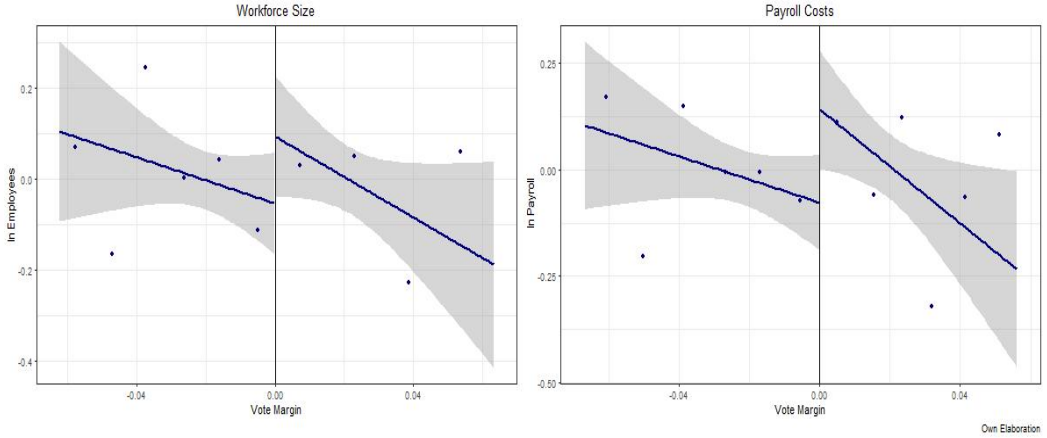
Table 6.3: Impact of an Owner's Election on Firm Performance: Including Outliers

	Dependent variable:					
	ln Employees			ln Payroll		
	(1)	(2)	(3)	(4)	(5)	(6)
Owner's Election	0.25*	0.18*	0.06	0.33**	0.25**	0.11
	(0.14)	(0.10)	(0.08)	(0.13)	(0.10)	(0.08)
bw_l	0.03	0.06	0.12	0.03	0.07	0.13
bw_r	0.03	0.06	0.13	0.03	0.06	0.11
N_l	165	298	442	168	316	452
N_r	138	252	336	121	237	326
N	303	550	778	289	553	778
Runner-up Mean	2.17	2.14	2.11	8.86	8.79	8.78
sd	1.09	1.12	1.10	1.17	1.21	1.23
bw	.5CCT	CCT	2CCT	.5CCT	CCT	2CCT
Baseline Char.	YES	YES	YES	YES	YES	YES
Election FE	YES	YES	YES	YES	YES	YES

*p<0.1; **p<0.05; ***p<0.01

Note: This table reports the point estimates and standard errors of the estimated impact of having an owner elected mayor for six specifications of equation (4-3). Besides the main effects, it depicts details about each regression. The bw_l and bw_r compose the bandwidth used, such that only firms associated with a vote margin within the interval $(-bw_l, bw_r)$ are considered. Then the number of observations used associated with a loser (N_l) and winner (N_r) candidates, as well as its sum (N), are reported. "Runner-up Mean" is the average value of the dependent variable among companies of candidates that lost the election. The "sd" represents the standard deviation of the dependent variable. The "bw" parameter indicates if the mse optimal bandwidth was used (CCT), half of it (.5CCT), or its double (2CCT). Then "Baseline Char." and "Election FE" punctuate if controls for firm baseline characteristics and election fixed effects were used. The first three columns utilize the log of the number of employees as the dependent variable. In contrast, the others use the log of the payroll expenses.

Figure 6.3: Effects of the Owner's Vote Margin on Firm Performance: Including Outliers



Note: Each panel in this figure plots a linear regression of the measures of firm performance on the vote margin of the business owner, controlling for year fixed effects and baseline characteristics. The estimations are calculated separately for positive and negative values of the vote margin. The first group is associated with mayor-owned enterprises. The latter is composed of companies from candidates who lost the election. The 95% confidence interval is reported as a shaded area around the fitted curve. The data is separated into evenly spaced bins; the points represent the average value of the dependent variable in that bin. The left panel uses the log of the firm's number of employees to measure its performance. While the right panel utilizes the log of the company's payroll.

Moreover, as discussed in the fourth section, the regression discontinuity design can only identify a LATE. More specifically, the effect of having an owner elected mayor through a close election. The advantage of this strategy is the causal interpretation of the estimate. The downside is the impossibility of extrapolating the results to mayor-owned businesses whose owners were elected in a less competitive contest.

To provide some perspective on the external validity of the results, one can estimate variations of equation (6-1). It assesses the average treatment effect (ATE) of having an owner elected on firm performance. It relies on the identification hypotheses of parallel trends, which means that mayor-owned companies need to be on the same trajectory as firms from runner-up candidates. This hypothesis is testable, and the test is presented by figures 9.1 and 9.2 of the Appendix.

$$y_{it} = \beta_0 + \beta_1 IO_{it} + \beta_2 VM_{it} + \beta_3 IO_{it} VM_{it} + \theta_i + \zeta_t + u_{it} \qquad (6\text{-}1)$$

Where $y_i t$ is a firm i outcome in year t , IO_{it} indicates if the owner of company i is in office in the year t and VM_i is his or her *VoteMargin* as explained in section 4. In addition, θ_i and ζ_t are, respectively, firm and year fixed effects. The coefficient of interest is β_1.

The table 6.4 and 6.5 report the estimates of equation (6-1) for two groups of firms. The first four columns are estimated considering all companies whose owner ran for mayor and finished the race first or second place. The others include only businesses from candidates who disputed a close election, another robustness check on the results. All specifications indicate positive effects from the election of an owner, supporting the estimates presented in section 5.

Table 6.4: Impact of an Owner's Election on Firm's Workforce Size: Two-way Fixed Effects Estimates

	Dependent variable: ln of the Number of Employees							
	Complete Sample				Close Election			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IO	**0.154*****	**0.117*****	**0.147*****	**0.046***	**0.169*****	**0.161*****	**0.160****	**0.088****
	(0.042)	**(0.025)**	**(0.043)**	**(0.026)**	**(0.064)**	**(0.039)**	**(0.063)**	**(0.040)**
VM	0.362**		0.371**		1.052		0.806	
	(0.143)		(0.144)		(0.683)		(0.688)	
IO:VM	−1.094**	−0.251	−1.071**	−0.108	−1.383	−1.506	0.422	−0.819
	(0.517)	(0.310)	(0.513)	(0.305)	(2.381)	(1.437)	(2.284)	(1.392)
Constant	2.047***				2.026***			
	(0.011)				(0.016)			
N	11,014	11,014	11,014	11,014	5,633	5,633	5,633	5,633
Firm FE	NO	YES	NO	YES	NO	YES	NO	YES
Year FE	NO	NO	YES	YES	NO	NO	YES	YES

*p<0.1; **p<0.05; ***p<0.01

Note: This table reports the point estimates and standard errors of the estimated impact of having an owner elected mayor for eight specifications of equation (6-1). Specifications (1) to (4) include all firms whose owners ran for mayor and finished first or second. The other four regressions include only companies that disputed a close election. In this case, it is defined as being associated with a *Vote Margin* between -0.05 and 0.07. Besides the estimated effects, it depicts details about each regression. N is the number of observations used. The "Firm FE" and "Year FE" indicate, respectively, if company and year fixed effects were included in the specification. The primary coefficients of interest and their standard errors are highlighted in bold format.

Table 6.5: Impact of an Owner's Election on Firm's Payroll: Two-way Fixed Effects Estimates

	Dependent variable: ln of the Payroll Expense							
	Complete Sample				Close Election			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IO	**0.247*****	**0.256*****	**0.179*****	**0.051***	**0.288*****	**0.356*****	**0.229*****	**0.103*****
	(0.045)	**(0.027)**	**(0.045)**	**(0.026)**	**(0.067)**	**(0.042)**	**(0.066)**	**(0.040)**
VM	0.179		0.358**		0.957		1.262**	
	(0.153)		(0.153)		(0.620)		(0.620)	
IO	−0.758	−0.336	−0.866	0.009	−2.224	−3.760**	−2.044	−1.298
	(0.548)	(0.336)	(0.541)	(0.310)	(2.532)	(1.566)	(2.418)	(1.433)
Constant	8.695***				8.678***			
	(0.012)				(0.016)			
N	10,751	10,751	10,751	10,751	6,146	6,146	6,146	6,146
Firm FE	NO	YES	NO	YES	NO	YES	NO	YES
Year FE	NO	NO	YES	YES	NO	NO	YES	YES

*p<0.1; **p<0.05; ***p<0.01

Note: This table reports the point estimates and standard errors of the estimated impact of having an owner elected mayor for eight specifications of equation (6-1). Specifications (1) to (4) include all firms whose owners ran for mayor and finished first or second. The other four regressions include only companies that disputed a close election. In this case, it is defined as being associated with a *Vote Margin* between -0.06 and 0.07. Besides the estimated effects, it depicts details about each regression. N is the number of observations used. The "Firm FE" and "Year FE" indicate, respectively, if company and year fixed effects were included in the specification. The primary coefficients of interest and their standard errors are highlighted in bold format.

7
Mechanism Discussion

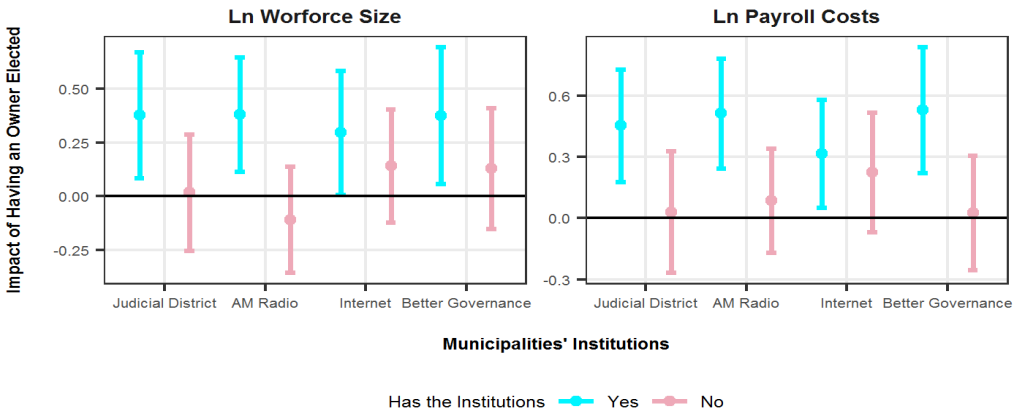
The results presented so far provided evidence that firms grew more because their owner became mayor. Nonetheless, it is not clear what is the mechanism behind this effect. If it relies, at least partially, on corruption, the estimated impact would likely be more substantial on corruption-prone municipalities. This section reports an exercise that tests this but does not yield a significant conclusion.

First of all, it is worth noticing that there is not a clear metric to define what cities are more subject to corruption. Despite that, one could compare municipalities with different levels of law enforcement or public accountability. A proxy for the likelihood of punishment could be the presence of the state judiciary (Litschig & Zamboni, 2019). The degree of public accountability can be approximated by the presence of AM radio or an internet provider (Ferraz & Finan, 2011).

In addition, one could estimate the effect of having an owner elected in cities with a *governance* index (Naritomi et al., 2012) above the median separately from the others. On the one hand, in these places, the mayor is likely subject to stronger oversight. However, they control a more capable administration and might have more opportunities to engage in rent-seeking activities.

Figure 7.1 reports the estimated impact of having a partner elected on firm performance accordingly to the city's institutions. It does not suggest that these effects are concentrated in municipalities with weaker institutions. Regardless of the proxy used, the 95% confidence intervals always cross, indicating the absence of a significant difference. Despite this, the point estimates are higher for towns with the studied institutions.

Figure 7.1: Impact of an Owner's Election on Firm Performance: Accordingly to the City's Institutions



Note: This figure plots the estimated impact of having an owner elected for different groups of cities. Each point corresponds to one specification and its 95 percent confidence interval. The left panel utilizes the log of the average number of employees during the elected mayor's term as the dependent variable. While the right one employs the log of the firm's average payroll as such. The effects in the municipalities that have the institutions are plotted in blue, while the impact in cities without it is in pink. Four institutional metrics are considered. *Judicial District* indicates that the city is the headquarters of a *comarca*. That means there is a state judge present. *AM Radio* is a dummy indicating if the municipality had an AM radio at the begging of the mayor term. *Internet* registers if the city had an internet provider. *Better Governance* mark if the municipal administration has an above-median *governance* index.

The figure above does not indicate that corruption is part of the mechanism sustaining the observed growth experienced by mayor-owned businesses. Nonetheless, it is not enough to disregard this possibility neither. The graphs suggest that the impact of having an owner elected is more significant in cities with a more capable administration. It is worth noticing, however, that the institutional proxies considered are positively correlated. Therefore, the four heterogeneity analyses might be capturing analogous variations. Moreover, it is not possible to determine which one is more important for the results.

Furthermore, other mechanisms could be sustaining the improved performance of mayor-owned companies. For instance, it is worth remembering that enterprises owned by the mayor are in different cities than the ones of runner-up candidates. Therefore, if cities governed by business owners tend to increase their economic activity, this could generate the observed effects exposed in section five. Alternatively, the abnormal growth could result from a marketing effect caused by the new position of the owner.

The mechanism that is sustaining the improved performance of mayor-owned companies matters from a policy perspective. For example, if the mayors are engaging in rent-seeking activities, a stronger oversight might be needed. If the firm is growing because of a marketing effect, voters may use this information to cast doubt on the intentions of business owners candidates, possibly harming their electoral prospects. The opposite of what would happen in a third scenario, where having an entrepreneur as mayor improves economic activity, and, therefore, the mayor-owned business grew. All in all, further investigation about the mechanisms behind these results is needed to elaborate on policy implications.

8
Concluding Remarks

This work provided causal evidence of real impacts from a relatively less studied type of political connection. It demonstrates that mayors' businesses grew more than they would if their owners had lost the election. Nonetheless, the mechanism sustaining this benefit remains unclear. The effects do not appear to be concentrated in cities with less developed institutions. A result that does not indicate corruption is part of it but highlights the need to investigate alternative mechanisms that could sustain this abnormal growth.

Furthermore, it remains unclear if the results would hold for other elected positions or periods without economic growth. There is some evidence that connections with lower-level politicians might be worth more because of looser oversight (Do et al., 2021). In addition, the agency model suggests politicians could extract more resources in generalized growth periods (Persson et al., 2000).[1] Analyzing disputes for other offices and periods could be a promising pathway to advance research on this topic.

[1]From 2002 to 2015, Brazil experienced favorable rates of GDP growth.

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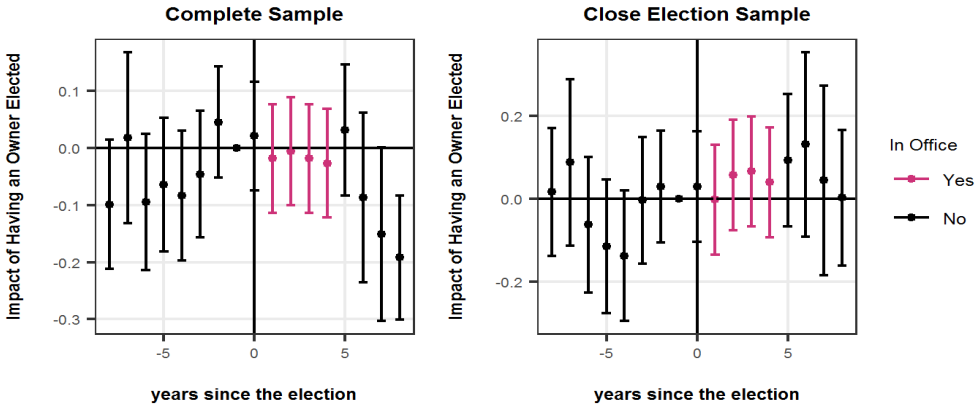
9
Appendix

Table 9.1: Equivalence between Sector and CNAE Codes

CNAE Code	Sector
0 to 5000	Agriculture
5000 to 10000	Mining
10000 to 35000	Industry
35000 to 45000	Infrastructure
45000 to 46000	Vehicular
46000 to 47000	Wholesale
47000 to 48000	Retail
48000 to 54000	Infrastructure
54000 to 55000	Hospitality
55000 to 58000	Restaurants
58000 to 64000	Communication
64000 to 67000	Finance
67000 to 69000	Real State
69000 to 76000	Services
76000 to 85000	Public Administration
85000 to 86000	Education
86000 to 89000	Health Care
89000 to 94000	Culture
94000 to 100000	Others

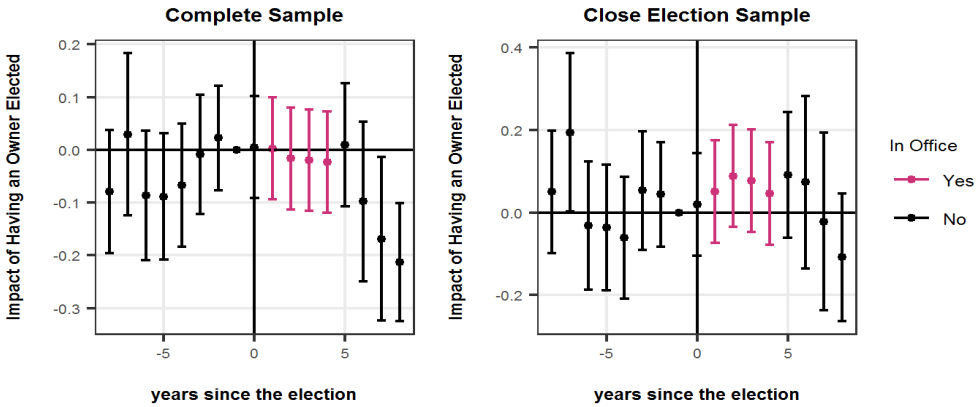
Note: This table depicts how the firms were classified into sectors accordingly to the CNAE code of their main activity. The right column shows the interval that defines the sector in the left column. All companies with CNAE codes within the interval in the right are considered part of the sector on the left.

Figure 9.1: Testing for Parallel Trends in the Workforce Size



Note: This figure plots the estimated impact of having an owner elected in the firm's outcomes in different years. The election-year is represented by 0 at the horizontal axis. Negative values are associated with the years before the election, and positive ones correspond to the years after the election. Each point corresponds to one estimate and its 95 percent confidence interval. All specifications firm and year fixed effects. The right panel considers all firms whose owner ran for mayor and finished in first or second place. The left panel includes only companies that disputed a close election. In this case, it is defined as being associated with a Vote Margin between -0.05 and 0.07. The effects in the mandate's years are presented in pink.

Figure 9.2: Testing for Parallel Trends in the Payroll Expenses



Note: This figure plots the estimated impact of having an owner elected in the firm's outcomes in different years. The election-year is represented by 0 at the horizontal axis. Negative values are associated with the years before the election, and positive ones correspond to the years after the election. Each point corresponds to one estimate and its 95 percent confidence interval. All specifications firm and year fixed effects. The right panel considers all firms whose owner ran for mayor and finished in first or second place. The left panel includes only companies that disputed a close election. In this case, it is defined as being associated with a Vote Margin between -0.05 and 0.07. The effects in the mandate's years are presented in pink.