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Do Politicians With Business Backgrounds Influence Local Business Environment?

Evidence From Brazilian Municipalities

Recife

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Dissertação apresentada ao Programa de Pós-Graduação em Economia do Departamento de Economia da Universidade Federal de Pernambuco como requisito parcial para obtenção do grau de Mestre em Economia.

Orientador (a): Prof. Paulo Henrique Pereira de Meneses Vaz

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ABSTRACT

Recently, businesspeople have been succesfull in elections around the world. Although part of their speech and racing campaigns are related to pro-business policies, little is known about the impact of their elections on the business environment. This work investigates the impacts of electing candidates with business experience on the number of companies and employees, and in wages and workforce characteristics, in Brazilian municipalities. Close electoral races were explored using a regression discontinuity (RD) design. The results obtained indicate that there is no effect on the aggregate number of companies and formal employees, but there are heterogeneous effects by sizes of both companies and municipalities and also by sectors of activity. Regarding the workforce characteristics, there is an increase of 5-7 % in wages, driven by the industry and services sectors, and a small improvement in the educational level of workers in services and agriculture. These results, however, are not significant when separating municipalities by size.

Keywords: elections; business environment; regressions discontinuity.

RESUMO

Recentemente empresários têm tido sucesso em eleições ao redor do mundo. Apesar de parte de seus discursos e campanhas serem relacionados a políticas *pro-business*, pouco se sabe se a respeito do impacto de suas eleições para o ambiente de negócios. Este trabalho investiga o efeito da eleição de candidatos com experiência profissional em negócios no número de empresas e empregados, e em salários e características da força de trabalho, em cidades brasileiras. Foram exploradas as disputas eleitorais acirradas utilizando um desenho de regressão descontínua (RD). Os resultados obtidos indicam que não há efeito sobre o número agregado de empresas e empregados formais, porém há heterogeneidades no tamanho de empresas e municípios e também nos setores de atividate. Com relação às características da força de trabalho, há um aumento de 5-7% nos salários, puxado pelos setores de indústria e serviços, e uma pequena melhora no nível educacional dos trabalhadores em serviços e agropecuária. Esses resultados porém não são significantes quando separados por tamanho de municípios.

Palavras-chaves: eleições; ambiente de negócios; regressão descontínua.

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1 INTRODUCTION

Around the world there seems to be a trend towards the election of successful executives into public office. In the United States, for example, the share of former executives serving in office increased from about 13-14% between 1980 and 2000 to more than 21% in 2014 (BABENKO; FEDASEYEU; ZHANG, 2018). Brazil is also a case that evidences this trend, as the number of entrepreneurs getting elected for mayor increased from 700 in 2012 to 828 in 2016, the biggest raise amongst all candidates' ocupations[1]. At least part of these candidates' rhetoric and campaign proposals are related to debureaucratization of business activities and the promotion of good environments for business to thrive, which leads to the question this work attempts to answer: what are the causal effects of electing politicians from business backgrounds on local business environments?

According to the literature part of the reasons why businesspeople run for office is to guarantee that their interests are represented. In places with underdeveloped markets, entrepreneurs may participate in politics in order to make their business operations easier (LI; MENG; ZHANG, 2006). Gehlbach, Sonin e Zhuravskaya (2010) state that when institutions hold elected officials accountable to voters - like free media and government transparency - there are less incentives for executives to compete. But when those institutions are weak, they may prefer to do otherwise in order to avoid the cost of lobbying. Regarding countries with strong institutions such as the United States, Babenko, Fedaseyeu e Zhang (2018) show that the increasing share of businessmen holding office is mostly supply-driven and that both higher exposure to global competition and higher federal regulations are important factors motivating their candidacy.

In most countries there is little evidence if the recent success of business politicians is related to a bigger supply or an increase in voters' demand for executives holding office. Although in Brazil the latter seems to be true, since the political establishment has been discredited by most citizens in a context of several recent corruption scandals. Oliveira et al. (2019) argue that instead of trying to change the political elite's behavior, Brazilians chose to elect candidates from outside the mainstream, which includes some successful executives.

Some work has been done regarding the overall performance of businesspeople holding office, with mixed results for policy outcomes. Blaschke (2017) finds that in Brazil mayors

[1] (MAGALHãES, 2016). Available at: <https://noticias.r7.com/eleicoes-2016/cresce-numero-de-empresarios-eleitos-para-cargo-de-prefeito-no-brasil-08102016. Accessed: 24/06/2019.

from entrepreneurial backgrounds are likely to attract more transfers from higher levels of government, compared to politicians from other backgrounds, increasing municipalities' revenue, though the results depend on the definition of businessperson used. On the other hand, Beach e Jones (2016) find no evidence that electing candidates with business experience for city councils in California impacts city revenues, expenditures and unemployment.

With respect to private gains, a lot of studies examine if and how politicians can take advantage of their position in office to benefit either firms in which they are shareholders or firms connected to them (FISMAN, 2001; FACCIO, 2006; CINGANO; PINOTTI, 2013), and also when politicians themselves are the executives (BUNKANWANICHA; WIWATTANAKANTANG, 2008; DELLAVIGNA et al., 2016; SZAKONYI, 2018). There is little evidence however if electing people with business backgrounds for office impacts the outcomes of local firms in general. If they are able to improve the business environment then this may be part of the explanation for their recent electoral success.

Brazilian municipalities are ruled by mayors and a city council elected for four-year mandates and, as the the local chief executive officers, mayors are responsible for the allocation of resources. Although municipalities usually depend on state and federal transfers, with the latter accounting on average for 65% of their total budget (BROLLO; TROIANO, 2016), attracting more business and/or improving the business environment can increase municipalities' earnings, since firms and autonomous workers in the service sector must pay local taxes (*Imposto Sobre Serviços*). However, Blaschke (2017) finds no evidence that electing businessmen increases tax revenues, though his work does not account for a part of the state transfers that come from the *Imposto sobre Circulaçao de Mercadorias e Serviços* (ICMS), the main tax levied by states and similar to a value-added tax that is transferred back to the municipalities where the transactions took place[2].

Mayors can provide fiscal incentives and infrastructure (such as roads, land and street lightning) and - perhaps more importantly for bigger cities - reduce the bureaucracy required to open up firms, in order to attract new business to their municipalities and stimulate economic growth. As politicians from business backgrounds may be more familiarized with the everyday struggles faced by local firms, they can perhaps implement more business-driven policies that could lead to an increase in the number of firms or even in the size of the firms in the municipality. Or it may be the case that they just have a different set of preferences over

[2] For small cities in the State of Minas Gerais averaging near ten thousand inhabitants, this accounts for roughly 15% of total revenues (MASSARDI; ABRANTES, 2014)

policies, that can reflect on public spending and therefore impact policy outcomes.

This work contributes to the literature by investigating whether local firms in general benefit from the election of politicians with business experience, and not only companies connected to them. To identify this effect, this study employs a Regression Discontinuity (RD) Design on "close elections"for mayor in Brazilian cities in the 2008 and the 2012 municipal elections. RD designs in close elections have been widely used as an identification strategy, with the underlying assumption that a candidate's victory in such cases can be treated as if it was a random event (LEE, 2008). Using this strategy, Boas, Hidalgo e Richardson (2014) find that firms that help elect federal-deputies through campaign donations get higher access to government contracts. Also, Brollo e Troiano (2016) find that women mayors are less likely to engage in corruption, hire less temporary public employees and have a lower probability to get reelected than male mayors, among many other examples (BHALOTRA et al., 2014; AKEY, 2015; COVIELLO; GAGLIARDUCCI, 2017; HYYTINEN et al., 2018; SZAKONYI, 2018). The outcomes of interest in the present work are related to business environment such as the average number of both firms and employees, changes in the average size of firms, and average monthly salaries and other workforce characteristics, in each municipality during the 4 years of legislative period.

RD estimates indicate that the election of businesspeople for mayor has no significant effect on the overall number of firms and employees, or for any of the three sectors analyzed separately (farming and agriculture, industry and services). However, when separating municipalities in two groups by population size and doing the same with companies (by number of workers), there are evidences of heterogeneous effects. For the small towns (with an average of 6.3 thousand inhabitants) the estimates yield a positive impact only for the small farming and agriculture firms of 21-24% and 25-26% on the number of business companies and employees, respectively. Regarding the bigger cities in the sample, only the "big"companies in this same sector are affected, with a decrease of 6-9% in the number of firms and a large reduction of 46-47% in the number of employees.

In respect to workforce characteristics, mayors with business experience lead to a raise of about 5% in the average monthly salaries, due to increases on the industry and services sectors. However, this result becomes non-significant when separating municipalities by size, probably due to bigger standard errors. Lastly, there is also evidence of positive effects on the education level of workers on both farming and agriculture and services sector, which may be related to the increase in the average wages.

Brazil is an interesting case for such a study mainly for three reasons. First, the increase

in the number of businessman politicians elected for mayors is significant. According to the data from the *Repositório de Dados Eleitorais*, the share (number) of candidates reporting themselves as executives (*Empresário*) winning mayor elections in the first round varied from 1,8% (99) in 2000, to 6,9% (382) in 2004, to 14,6% (822) in 2016.

Second, corporate campaign donations was prohibited by the Brazilian supreme court in 2015, leading to a decrease in 65% on total donations made in the first round of the 2016 elections relative to the previous one, in 2012[3]. Since campaign donations are one of the means through which businesspeople can exert influence over politicians (SAMUELS, 2002; CLAESSENS; FEIJEN; LAEVEN, 2008; BOAS; HIDALGO; RICHARDSON, 2014; LAZZARINI et al., 2015), this may possibly lead to an increase in the executive's value of holding office. However, people can still make donations up to 10% of their total earnings in the previous year, such that the wealthiest citizens – like big companies CEO's – can have an unbalanced influence on electoral outcomes[4].

Third, as of 2015 candidates may fund their own campaigns constrained by a spending limit for each municipality. So even in small parties that do not have access to high amounts of resources from the public campaign fund, wealthy businesspeople can engage in competitive candidacies.

The rest of the work is organized in the following manner. Section 2 presents the institutional background regarding Brazilian municipalities and a brief discussion on possible mechanisms that may lead municipalities with mayors from business backgrounds to improve their business environment. Sections 3 and 4 detail the data and empirical strategy used, respectively. Results are presented on section 5. Lastly, section 6 presents final considerations and conclusion.

[3] Donations made in the first round fell from 7,2 to 2,9 billion Brazilian Reais from 2012 to 2016 (SOUZA, 2016).

[4] In Rio de Janeiro, 58 of the 59 biggest donors held high positions in companies (SOUZA, 2016).

2 INSTITUTIONAL BACKGROUND

In Brazil, municipalities are ruled by mayors and a city council elected for four-year mandates. As the the local chief executive officers, mayors are responsible for the allocation of cities' resources and for collecting local taxes. But most municipalities do not raise enough funds from those taxes and so they depend on state and federal transfers, with the latter accounting on average for 65% of their total budget (BROLLO; TROIANO, 2016).

The federal government transfers money to municipalities through different sources, being the *Fundo de Participação dos Municípios* (FPM) the most important one (MASSARDI; ABRANTES, 2014). The main factor that determines how much transfers they receive from the FPM is the size of the population, which does not vary substantially over the legislative period[1]. Municipalities are separated by size bands into five categories and each one is attributed with a different coefficient, with some discontinuity within bands.

Blaschke (2017) finds that electing executives for mayor leads to an increase in total revenues when comparing to municipalities with mayors from other backgrounds, but this is attributed to higher amounts of transfers that municipalities receive, since there is no effect on local taxes revenue. Although the author argues that this effect comes from businesspoeple's better negotiation skills, it may also be the case that those municipalities had a higher growth in population or even that they receive more transfers due to more business activity, since a significant part of the state transfers are from the *Imposto sobre Circulaçao de Mercadorias e Serviços* (ICMS) - the main tax levied by states and is similar to a value-added tax, that is partly transferred back to municipalities where the transactions took place. While the municipal taxes originate only 6,43% of total revenues (BLASCHKE, 2017), the ICMS transfers may account for other 15% in the case of small cities (MASSARDI; ABRANTES, 2014).

Regarding the business environment, mayors can provide local firms with fiscal incentives and infrastructure (such as roads, land and street lightning), decrease bureaucratic costs needed to open firms and, in some cases, can even privatize companies owned by the local government. In fact, amongst the campaign promises of the mayor of São Paulo from 2016 to 2018 and current governor of the state of São Paulo - one of the recent examples of former executive turned politician - were privatizing stated-owned companies, creating business hubs

[1] For example, from 2008 to 2012, half of the municipalities had a negative or null growth in population. While the first decile had a negative growth rate of 7,05%, the last decile and last percentile grew by 10,38% and 28,9%, respectively.

for startups and facilitating the opening up of new firms[2].

In Brazil, until 2019, all companies needed a licence that is granted by municipal governments (*Alvará de Funcionamento*) in order to start operating. Although this is no longer required for activities described as having low risk, it is still an obligation for firms in other activities (BRASIL, 2019). In order to get this license, companies must have a local address with a certificate that is also granted by the local government, among other things, which means that mayors may indeed influence the cost of opening up new firms.

Finally, mayors can also hire consulting services or make partnerships for the purpose of promoting the competitiveness of local firms and stimulating entrepreneurship, such as those offered by the *Serviço Brasileiro de Apoio às Micro e Pequenas Empresas* (SEBRAE), a nonprofit private entity created in 1972 to promote the development of small business in all of the 27 Brazilian states. One of the SEBRAE's programs aimed at enhancing local business environments, for example, covers more than 550 municipalities across 19 states[3].

If mayors from business backgrounds have a different set of preferences over policies than mayors from other backgrounds, and since there is evidence inicating that they are able to attract more transfers from federal and state governments, then this may perhaps reflect on how they allocate municipalities' resources and therefore impact policy outcomes. For example, they may be willing to spend more on business-driven policies. Also, as they may be more familiarized with the everyday struggles faced by local firms then that they achieve greater effectiveness on such policies.

[2] (AS..., 2016). Available at: https://exame.abril.com.br/pme/as-promessas-de-joao-doria-para-o-empreendedorismo-em-sp/. Accessed: 10/01/2020.

[3] (PROGRAMA..., 2018). Available at: https://revistapegn.globo.com/Negocios/noticia/2018/10/programa-de-desenvolvimento-de-liderancas-do-sebrae-chega-550-municipios.html. Accessed: 10/01/2020.

3 DATA

3.1 ELECTORAL DATA

This study focuses on the mayoral elections that took place in 2008 and 2012. In 2008 there were 5,565 municipalities across 27 states and from 2012 on this number increased to 5570. Each one of them holds local elections for mayors (and a city council) every 4 years, but the election system depends on the number of voters. Municipalities with more than 200,000 voters elect their mayors through a majority-rule and may have two rounds, if the candidate with the highest vote-share has less than 50% plus one votes. Only the first two candidates advance to the second round and, as in municipalities with less than 200,000 voters, the on that receives the highest share of votes wins.

Data on election results and candidates' information are taken from the *Repositório de Dados Eleitorais* of the *Tribunal Superior Eleitoral* (TSE), the highest judicial authority in the Brazilian electoral justice.

The judicial body in charge of municipal elections is the *Tribunal Regional Eleitoral* (TRE), and for every municipality there is a *Junta Apuradora*, a temporary agency nominated by local electoral judges, that is responsible for counting votes and annul voting sections if necessary[1]. If the votes invalidated are enough to alter the election results, then the vote counters must report to the TRE that in turn decides if there will be another poll, the so called *Eleição Suplementar*.

Besides invalidated votes, there are other situations that may lead to new elections. That includes: if the mayor's mandate gets revoked; he or she resigns or passes away; or if the winning candidate gets his or hers candidacy canceled after the election process. These may happen on different years and some municipalities can end up having various elections within a single legislative period[2]. To avoid possible spillover effects on posterior elections, all municipalities in which new elections occur are dropped from the dataset.

When registering for elections, candidates must report their occupations. In this work two different definitions of businessperson are used. The first, a more broad definition, includes entrepreneurs (*Empresário*), business directors (*Diretor de Empresas*), managers (*Administra-*

[1] For more information, see (BRASIL, 1965).

[2] For example, in *Conceição do Mato Dentro* - MG there were 3 elections and the city had at least 6 different mayors over the 2008-12 legislative period (ERNESTO, 2012).

Tabela 1 – Number of observations by businessperson definition

	Broad Definition	Narrow Definition
Year	Obs	Obs
2008	1577	970
2012	1712	1266
Total	3289	2236

dor)[3] and merchants (*Comerciante*). Candidates that fit this definition represent 22,2% of all 49,293 candidacies. The other, narrow definition, includes only the first three occupations. It represents 15,12% of the total number of candidates.

The dataset used in this study contains all mayoral elections held in 2008 and 2012 in which the first two candidates were exactly one businessman and one from another background, excluding those elections that were canceled by any of the reasons listed above. Only the second round was included in municipality-election pairs that had two rounds. Table 1 shows the number of observations by election year and by definition of businessperson.

3.2 FIRM OUTCOMES AND COVARIATES

Firms and employees data per municipality are obtained from the *Relação Anual de Informações Sociais* (RAIS), an annual census of all formal organizations and employees in Brazil that contains employer-employee matched datasets. The organizations dataset has information on number of employees, main business activity, state and municipality in which it operates, legal nature (e.g. public fund, public agency or private company), and one indicator of activity during the current year and other indicators of special tax regimes[4], while the employees dataset contains information on annual salaries, months worked and if/when each worker was laid off. This work focuses only on business entities, such as public and private companies, and their workers.

The business activities are divided into 4 categories: 1) agriculture, livestock and fishing; 2) industry; 3) services; and 4) infrastructure and construction. For each category, the outcomes of interest are the variations in the total number of firms, employees and in the average size of firms, during the legislative period.

State covariates are from the *Laboratório de Ciência de Dados do Ipea* (IPEA-Data). Data

[3] In Brazil, *Administrador* is a person with a major in Business or Public Administration.

[4] For example, small firms on the SIMPLES tax regime pay proportionally less taxes than big corporations

on Gini coefficient, illiteracy rate, unemployment and income per capita for the election years of 2008 and 2012 are taken from the Ipeadata 3.0 online tool[5].

The municipality covariates are population size, total GDP, and GDP by type of activity: agriculture and farming; industry; service sector; public administration and taxes. This data comes from the *Instituto Brasileiro de Geografia e Estatistica* (IBGE) and cover the period from 2008 to 2017.

[5] Available at http://ipeadata.gov.br/beta3/.

4 EMPIRICAL STRATEGY

As stated in Section 3.1 this work focuses on mayoral elections in which the two most voted candidates were exactly one businessperson and one non-businessperson. The objective is to estimate the effect of politicians from business backgrounds taking office on the local business environment, using a Regression Discontinuity (RD) Design. Treatment is assigned to municipalities in which a businessperson wins and the underlying premise is that, in sufficiently close elections, a candidate's victory can be treated as if it was a random event, which allows the identification of the causal effect (LEE, 2008; BEACH; JONES, 2016).

In the RD design, treatment is determined by whether individuals exceed a certain cutoff of an observable variable (running variable). The intuition behind it is that individuals just below this cutoff are a good comparison to the ones just above it (LEE; LEMIEUX, 2010). In the present case, municipalities in which the candidate from a business background barely loses vs municipalities in which she barely wins.

The probability of being elected is equal to 1 if the candidate has a higher vote-share than any other candidate, in the case of municipalities with less than 200,00 voters, or if the candidate has half the votes plus one, in the case of larger municipalities. Because of this deterministic assignment rule, the strategy here applied is a sharp RDD. The running variable is the margin of victory, defined by the difference in vote-shares between the candidate in the first place and the runner up, so that the cutoff is set to zero. That is, if the candidate with business experience *i* has a margin $M_{it} >= 0$ in election *t*, it means that she won that election. The reverse is true for $M < 0$.

4.1 IDENTIFICATION

Define $\tau_{it}(1)$ and $\tau_{it}(0)$ as the respectively potential outcomes of electing a businessperson and a non-businessperson in the municipality *i* over the legislative period *t*, with t $\in \{2008, 2012\}$. Thus, the estimation of interest is $\mathbf{E}[\tau_{it}(1) - \tau_{it}(0)|i \in I]$. However, since only one mayor is elected in each city at time *t*, it is not possible to know the difference between these two potential outcomes.

Treatment status is defined as $B_{it} = 1$ if the mayor is a businessperson and $B_{it} = 0$ otherwise, and the observed outcome can be written as $\tau_{it} = B_{it} * \tau_{it}(1) + (1 - B_{it}) * \tau_{it}(0)$.

A naive comparison of the average outcomes in municipalities with $B_t = 1$ and $B_t = 0$ would probably lead to a biased estimation because the decision to vote for candidates with business experience may be endogenous to municipality characteristics, for example. For this reason, the estimand of interest is the average treatment effect $\mathbf{E}[\tau_{it}(1) - \tau_{it}(0)]$ defined over a sub-selection of the population, i.e., those municipalities in which elections were sufficiently close. As stated before, the treatment group is defined as the municipalities in which a businessperson barely wins the election and the control group is composed of municipalities where the opposite occurs.

Define the margin of victory of a businessperson in the municipality *i* in time *t* as the running variable, M_{it} . The average treatment effect (ATE) is given by:

$$\gamma = \mathbf{E}[\tau_{it}(1) - \tau_{it}(0)|M_{it} = 0] = \lim_{M_{it}\to 0^+} Y_{it} - \lim_{M_{it}\to 0^-} Y_{it} \tag{4.1}$$

where Y_{it} is the observed outcome and γ represents a local effect, since it is restricted to the surroundings of the threshold.

Equation 4.1 can be estimated by nonparametric local polynomial regressions:

$$Y_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 B_{it} + \beta_3 M_{it} B_{it} + \epsilon_{it} \tag{4.2}$$

$$Y_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 B_{it} + \beta_3 M_{it} B_{it} + \beta_4 M_{it}^2 + \beta_5 B_{it} M_{it}^2 + \epsilon_{it} \tag{4.3}$$

or even by local polynomial regressions with covariates, in order to increase precision:

$$Y_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 B_{it} + \beta_3 M_{it} B_{it} + \delta Z_{it} + \epsilon_{it} \tag{4.4}$$

$$Y_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 B_{it} + \beta_3 M_{it} B_{it} + \beta_4 M_{it}^2 + \beta_5 B_{it} M_{it}^2 + \delta Z_{it} + \epsilon_{it} \tag{4.5}$$

where β_2 identifies the local ATE for all four specifications.

These local regressions restrict the analysis to municipalities in each elections were sufficiently close, that is, when $M_{it} \in \{-h, +h\}$. The selection of this bandwidth is thus a crucial part of the RDD. However, when choosing it, one has to account for the tradeoff between precision and bias of the estimation. Since the main assumption behind the strategy is that all covariates are continuous around the cutoff, smaller bandwithds would lead to more comparable municipalities. The problem is that this could generate imprecise estimations because

of the relatively small number of observations within this bands. In the other hand, larger bandwidths could lead to biased estimations, since observations too far from the threshold on both sides are not good for comparisons. The bandwidths used for this work were computed using the methods described in Calonico, Cattaneo e Farrell (2018).

4.2 VALIDITY OF THE RDD

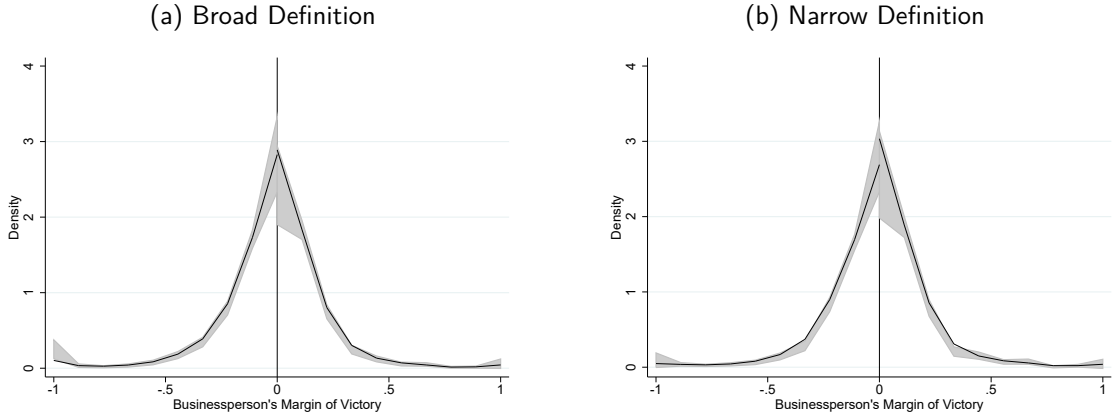
4.2.1 Manipulation Test

In order for the the RD design to be valid, that is, for the treatment to be interpreted as a causal effect, the first requirement is that individuals cannot manipulate the value of the running variable. In the present case, if businessperson candidates could choose their vote margins within a given interval, then it could be the case that receiving just a bit more votes than the runner up candidate was not random.

McCrary (2008) introduces a test for this type of sorting, based on the intuition that, if individuals can choose their score, then it would be expected that the density of the running variable would be discontinuous at the cutoff. Building on this idea, Cattaneo, Jansson e Ma (2019) propose a nonparametric estimator of the density function of the running variable, that was used in this study.

Figure 1 shows the manipulation tests for the two definitions of businessperson. In both cases there is no evidence of sorting around the threshold. Grey areas indicate the 95% confidence intervals.

Figura 1 – Manipulation tests by businessperson definition



4.2.2 Baseline Characteristics

Tabela 2 – Summary statistics of predetermined covariates

Broad definition	Obs	$B_{it} = 0$	Obs	$B_{it} = 1$	Diff	p-Value
Mayor Covariates						
Age	1666	48.298	1622	47.282	1.0168	0.003
Gender	1666	.908	1623	.943	−.035	0.000
Education	1666	6.654	1623	5.960	.694	0.000
Marital Status	1666	.903	1623	.894	.009	0.375
Coalition	1666	.974	1623	.983	−.009	0.068
State Covariates						
Gini coefficient	1666	.513	1623	.513	.001	0.564
Income per capita	1666	892.191	1623	896.178	−3.987	0.665
Unemployment	1666	6.901	1623	6.843	.0578	0.387
Illiteracy rate	1666	10.473	1623	10.549	−.0765	0.722
Municipality Covariates						
Log GDP	1666	18.601	1623	18.609	−.008	0.866
GDP per capita	1666	13414.87	1623	13072.67	342.199	0.619
Log Population	1666	9.442	1623	9.441	.001	0.983

GDP and population are in log due to the lack of space. Using the actual number does not change the test t results. $\beta_{it} = 1$ indicates the municipalities in which a businessperson won the race.

The other requirement, perhaps more important, is that in RD designs the baseline characteristics should have the same distribution near the cutoff for both control and treatment groups (LEE, 2008; LEE; LEMIEUX, 2010). In order to check this, the first step is to look at the mean differences in mayor, municipality and state covariates. The state and municipality baseline characteristics are from the election years, since elections only happen in October and candidates take office on January 1st. Also, in the case of close elections, it is usually not possible to anticipate the results, so future elections should not affect present outcomes[1].

Table 2 shows summary statistics and mean difference tests for all covariates, using the broad definition of businessperson. Most importantly, only the mayors' baseline characteristic differ between businessperson and non-businessperson candidates. The first group is younger, less educated and has more male candidates than the second. There are no difference in means regarding how frequently mayors run for office with the support from other parties (the

[1] Using one year lagged covariates does not change the baseline test results

coalition indicator) and the mayors' marital status. For all estimations errors are clustered at the municipality level.

Tabela 3 – Covariates balance test

	Broad Definition			Narrow Definition		
	RD Estimate	Obs	BW (h)	RD Estimate	Obs	BW (h)
Mayor covariates						
Age	0.0809	3,288	0.147	0.0220	2,235	0.144
	(0.995)			(1.270)		
Gender	0.0882***	3,289	0.138	0.0449*	2,236	0.150
	(0.0269)			(0.0267)		
Education	−0.614***	3,289	0.173	−0.494***	2,236	0.182
	(0.137)			(0.163)		
Marital Status	0.00869	3,289	0.157	0.0482	2,236	0.156
	(0.0248)			(0.0321)		
Coalition	0.00502	3,289	0.183	−0.0115	2236	0.142
	(0.0135)			(0.0186)		
State covariates						
Gini coefficient	−0.00332	3,289	0.160	0.000558	2,236	0.148
	(0.00311)			(0.00424)		
Per capita income	30.67	3,289	0.188	15.99	2,236	0.184
	(21.35)			(27.38)		
Unemployment	0.0944	3,289	0.126	0.192	2,236	0.150
	(0.202)			(0.239)		
Illiteracy rate	−0.799	3,289	0.160	−0.149	2,236	0.163
	(0.536)			(0.668)		
Municipality covariates						
GDP	−67,734	3,289	0.127	−232,399**	2,236	0.0993
	(73,167)			(109,649)		
GDP per capita	1,336	3,289	0.111	−330.5	2,236	0.0977
	(1,192)			(1,700)		
Population size	−3,405	3,289	0.0977	−12,381**	2,236	0.0977
	(3,628)			(4,919)		

The covariates were estimated using a nonparametric local linear regression, with mean squared error optimal bandwidhts. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

If municipality (or state) predetermined characteristics were different between both groups, this would mean that something happens in some municipalities that lead to the elections

of businesspeople. In other words, the election of mayors from business backgrounds would probably be endogenous to municipality characteristics and the RDD would generate biased estimations.

An alternative way tho test the validity of the RD design is to estimate the model replacing the dependent variable with each observed covariate (LEE; LEMIEUX, 2010). Instead of giving mean differences for both groups, this test returns the weighted differences for observations just above and just below the cutoff, using a kernel function. The nonparametric balance estimation of the covariates are presented in table 3.

With regard to mayor covariates, the local regression balance tests confirm that, near the cutoff, the share of male candidates from a business background is about 9% higher and they are less educated than the other candidates[2]. This reinforces the findings of Blaschke (2017), who uses the same strategy but with a different definition of businessperson and also includes the 2004 elections.

For the narrow definition, however, not only mayor covariates are unbalanced but also the municipalities' predetermined characteristics around the threshold. In this case, businesspeople winning elections by a close margin seem to happen more often on smaller municipalities.

Because of this problems with the identification regarding the narrow definition, the analysis will focus only on the sample with the broader characterization of businesspeople. It is assumed that differences between candidates are intrinsic to their occupations. First, businesspeople are on average less educated than the other candidates because it is not a professional requirement for merchants, entrepreneurs and business directors to have completed tertiary education as it is for lawyers, doctors, teachers, engineers, most public servants and other occupations that are common between candidates[3]. Second, following Blaschke (2017), it can be assumed that, in Brazil, women may face more obstacles that prevent them from being entrepreneurs or reaching high management positions.

One possible issue is that is some evidence that electing male and female candidates for mayor have different impacts on political outcomes in Brazilian municipalities (BROLLO; TROIANO, 2016). Although it is not clear if this could be the case regarding local firms' outcomes, it may be possible that the results come from this difference, at least in part. The

[2] The education variable is constructed by a scale of 1 to 8, with one being illiterate and 8 meaning that the candidate has completed tertiary education. The average for both groups in the broad definition, inside $\{h, -h\}$ is around 6.6 for non-businesspeople and 5.9 for businesspeople. For the narrow definition they are 6.66 and 6.16, respectively

[3] The only occupation described as being a businessperson that requires a bachelor degree is manager. Lawyers, doctors, teachers, engineers and public servants represent 21,81% of all candidates

same may be true for more educated vs less educated mayors.

5 RESULTS

5.1 NUMBER OF FIRMS AND EMPLOYEES

Tabela 4 – RD estimates for log of firms and employees

	(1)	(2)	(3)	(4)
VARIABLES	Log Firms	Log Firms	Log Firms	Log Firms
RD_Estimate	0.0546	0.105	0.0413	0.0450
	(0.117)	(0.0795)	(0.144)	(0.106)
Observations	3,289	3,288	3,289	3,288
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.154	0.154	0.222	0.222
BW Right	0.154	0.154	0.222	0.222
VARIABLES	Log Employees	Log Employees	Log Employees	Log Employees
RD_Estimate	0.0586	0.0641	0.0440	0.000670
	(0.166)	(0.115)	(0.208)	(0.154)
Observations	3,287	3,286	3,287	3,286
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.161	0.161	0.225	0.225
BW Right	0.161	0.161	0.225	0.225

RD estimates of the log number of firms and employees, during the legislative period. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

This work aims to find whether electing mayors from business backgrounds impacted the business environment of Brazilian municipalities, measured by firm related outcomes. In doing so, the first step is to verify if, overall, municipalities in which a businessperson won the election by a narrow margin have on average more firms and employees during the 4 years of term compared to municipalities in which the opposite occurred, since one of the main reasons that

lead mayors to implement business-driven policies is to attract new businesses. To estimate this effect, all four specifications are used and, for the two models that contain covariates, this work follows the recommendation of Calonico et al. (2019) to apply a covariate-adjusted RD estimator. Full nonparametric estimations are first run without covariates and the selected bandwidth and kernel are then used for the covariate-adjusted estimation.

Table 4 presents all estimates for the average logarithm of the number of both firms and employees at the aggregate-level. The first two models are local linear regressions, while models 3 and 4 are local polynomial regressions of the second order. All covariates are used in models 2 and 4 and none in the other two. The errors are clustered at the municipality level for all specifications, because the same municipality may be observed in more than one period.

There is no statistically significant difference in electing a businessperson for mayor with respect to these two outcomes, regardless of the model used. Applying different bandwidth selection methods (omitted for sake of simplicity) give similar results. Although all estimates in Table 4 are positive, they do not differ substantially from those obtained when comparing the same municipalities one year before election years (Table 14 in the appendix). Also, using instead the absolute number of firms and employees (Table 15 in the appendix) results in negative estimates, with only one specification statistically significant at the 10% level for the number of employees.

Another way to estimate the effect of electing mayors from business backgrounds in the number of firms and employees is to look at the percentage variation during the legislative period. Table 5 shows the results regarding the variation in the number of firms, employees and average size of firms, between the year before the mayors took office and the last year of mandate. For all three variables the sign of the estimates depend on the specification, though once again none are statistically significant. All estimates are small in terms of magnitude, varying between -0.007% and 0.0214% for the number of firms, -0.1% and 0.26% for the number of employees and -0.0446% and 0.123% for the average firm size.

Figure 2 presents graphical evidence for all five dependent variables through binned scatterplots showing the relationship between the businessperson's margin of victory and the firm related outcomes. As expected due to the lack of statistical significance on the regressions estimates, there does not seem to be a discontinuity at the cutoff for any of the variables analyzed. These results partly ratify the findings of Beach e Jones (2016). Using similar identification strategy they study the elections of businesspeople for city councils in California and find no evidence of impact on the city's unemployment rate.

Tabela 5 – RD estimates for percentage variation in the number of firms, employees and average firm size

	(1)	(2)	(3)	(4)
VARIABLES	$\%\Delta_{Firms}$	$\%\Delta_{Firms}$	$\%\Delta_{Firms}$	$\%\Delta_{Firms}$
RD_Estimate	-0.00699	0.0149	-0.00428	0.0214
	(0.0294)	(0.0278)	(0.0355)	(0.0337)
Observations	3,289	3,288	3,289	3,288
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.149	0.149	0.214	0.214
BW Right	0.149	0.149	0.214	0.214
VARIABLES	$\%\Delta_{Employees}$	$\%\Delta_{Employees}$	$\%\Delta_{Employees}$	$\%\Delta_{Employees}$
RD_Estimate	-0.100	-0.0756	0.162	0.266
	(0.203)	(0.199)	(0.287)	(0.283)
Observations	3,283	3,282	3,283	3,282
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.204	0.204	0.200	0.200
BW Right	0.204	0.204	0.200	0.200
VARIABLES	$\%\Delta_{AvgSize}$	$\%\Delta_{AvgSize}$	$\%\Delta_{AvgSize}$	$\%\Delta_{AvgSize}$
RD_Estimate	-0.0446	-0.0356	0.0781	0.123
	(0.153)	(0.151)	(0.199)	(0.196)
Observations	3,283	3,282	3,283	3,282
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.174	0.174	0.202	0.202
BW Right	0.174	0.174	0.202	0.202

RD estimates of the percentage variation in the number of firms and employees, and in the average size of firms, during the legislative period. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

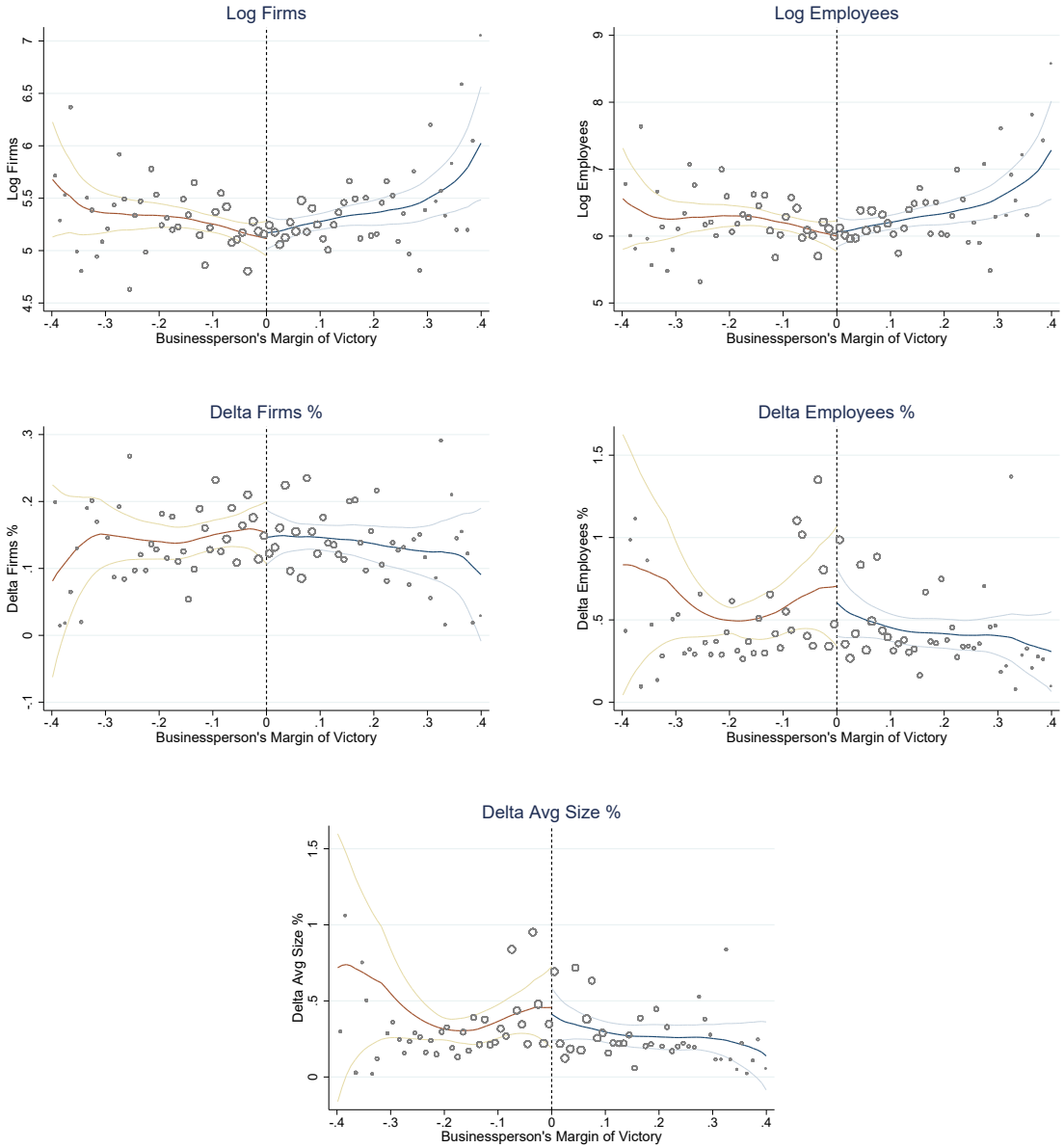


Figura 2 – Aggregate effects on logarithm and percentage variation of firms and employees

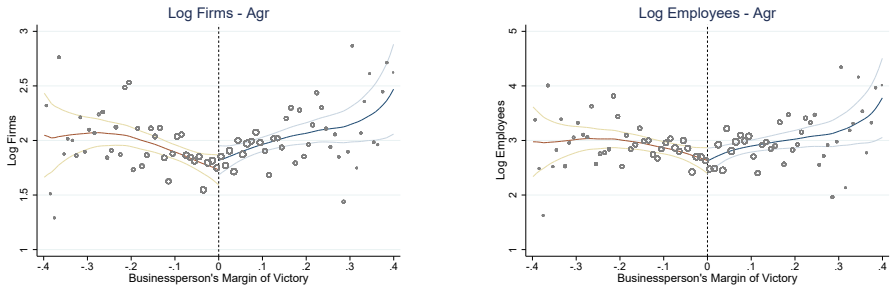
5.1.1 Results by municipality size and firm sector

It is possible that mayors from business backgrounds affect local business environments in such a manner that, while the aggregate number of firms and employees does not vary - relative to municipalities with mayors from other professional backgrounds -, market structures change. That is, it may be the case that while there is no impact at the aggregate-level, there are heterogeneous effects for different types of firms and municipalities. In order to investigate this possibility, the focus now turns to a less aggregate view, separating firms by sector and

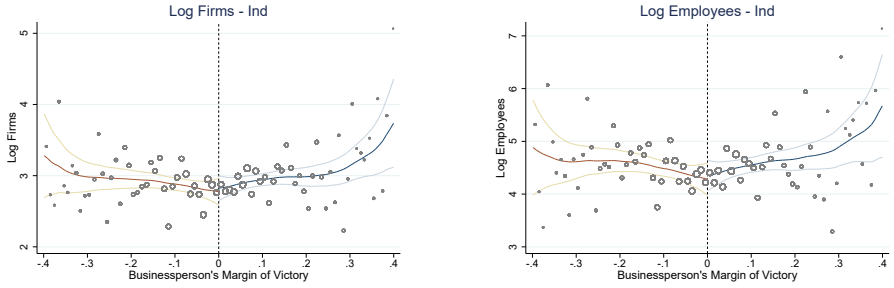
municipalities by population size.

Analyzing firms by sector is important because mayors, when creating incentives for certain firms or a particular industry, may change the institutional framework such that some activities end up being more attractive for entrepreneurs. This could lead companies to switch between sectors. Thus, firms are classified into three groups, by type of activity: agriculture and farming (from here on described as agribusiness); extractive industries and manufacturing (from here on industry); and services.[1] Together they contain roughly 94% of all firms in the sample, and those that do not fit in any of the groups are dropped from the analysis.

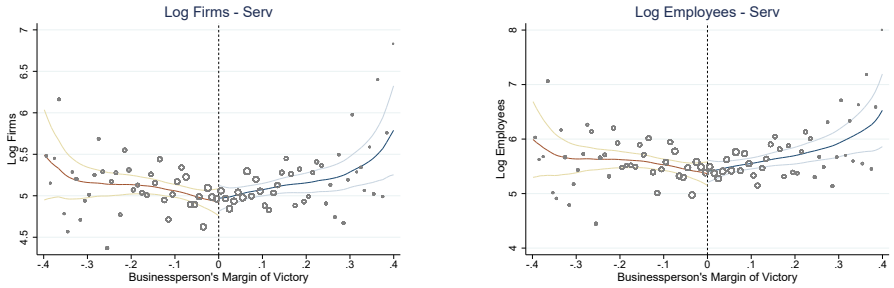
Figure 3 shows that businessperson mayors do not affect the number of firms and employees for any of the three sectors, when considering all municipalities in the sample [2].



(a) Farming and agriculture



(b) Industry



(c) Services

Figura 3 – Effects on firms and employees per business sector

[1] Sector classifications using two-digit CNAE are showed in Table 16 in the appendix.

[2] Though not displayed here, RD estimates confirm those results, as none of the specifications yield statistically significant estimates, for any sector.

Tabela 6 – Summary statistics by sector and municipality size

	Towns		Cities			
	Obs	Mean	Obs	Mean	Diff.	p-Value
Share of GDP						
Farming and Agri.	1645	.2480	1644	.1473	.1007	0.000
Industry	1645	.1052	1644	.1532	−.04794	0.000
Services	1645	.2592	1644	.3301	−.0709	0.000
Municipality Characteristics						
Population	1645	6286.24	1644	48799.53	−42513.29	0.000
GDP per capita	1645	14078.1	1644	14635.57	−557.47	0.420
Agribusiness Sector						
Avg Firms - Small	1645	6.296	1644	19.830	13.534	0.000
Avg Employees - Small	1645	8.932	1644	31.085	22.152	0.000
Avg Firms - Big	1645	0.615	1644	2.634	2.020	0.000
Avg Employees - Big	1645	30.775	1644	157.194	126.419	0.000
Industry Sector						
Avg Firms - Small	1645	13.263	1644	97.257	83.995	0.000
Avg Employees - Small	1645	23.222	1644	187.211	163.990	0.000
Avg Firms - Big	1645	3.198	1644	28.290	25.092	0.000
Avg Employees - Big	1645	177.135	1644	1960.271	1783.136	0.000
Services Sector						
Avg Firms - Small	1645	95.315	1644	946.162	850.848	0.000
Avg Employees - Small	1645	103.536	1644	1324.585	1221.048	0.000
Avg Firms - Big	1645	3.063	1644	90.039	86.975	0.000
Avg Employees - Big	1645	72.446	1644	3318.14	3245.696	0.000

Mean differences are computed for each characteristic between "towns"and "cities"using t tests with different variances.

In respect to size, municipalities that are relatively small differ from the bigger cities in terms of economic structure, i.e., the share of each sector on GDP and the relative size of firms in each group differs from one to the other. Therefore, municipalities are divided into "towns", if the population size is equal to or less than the median population, and "cities", if the opposite is true. Table 6 presents summary statistics and mean differences between the two groups.

As in the aggregate-level, for each municipality-size-sector group the outcomes of interest are the average logarithms of the numbers of both firms and employers during the 4 years of

mandate. Since there are groups for which the number of firms and employees is zero, all the dependent variables analyzed in this section are thus transformed from Y_{it} to $log(Y_{it}+1)$. Table 7 shows estimates by sector and municipality size, using model 2 (linear specification with all covariates). Results suggest that neither outcomes vary significantly when electing businesspeople, whether combining all three sectors or restricting to firms in the industry or services sectors. Though is it worth noting that all estimates yield negative estimates for the cities group, while the opposite occurs for small towns.

Tabela 7 – RD estimates for the average logarithm of firms and employees by sector and municipality size

	Towns				Cities			
	Agr	Ind	Serv	All	Agr	Ind	Serv	All
Log Firms								
RD_Estimate	0.213**	0.0771	0.0650	0.0637	-0.114	-0.0981	-0.0263	-0.0350
	(0.0931)	(0.0962)	(0.0596)	(0.0580)	(0.125)	(0.115)	(0.0865)	(0.0838)
Observations	1644	1644	1644	1644	1644	1644	1644	1644
BW	0.220	0.140	0.142	0.130	0.171	0.176	0.173	0.166
Log Employees								
RD_Estimate	0.177	0.0206	0.0733	0.0830	-0.343	-0.169	-0.0963	-0.177
	(0.191)	(0.204)	(0.0806)	(0.100)	(0.209)	(0.217)	(0.119)	(0.124)
Observations	1644	1644	1644	1644	1644	1644	1644	1644
BW	0.162	0.157	0.211	0.139	0.210	0.200	0.192	0.166

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

However, when restricting the analysis to the agribusiness sectors, there is evidence that mayors from business backgrounds positively impact the average number of firms in small towns. This result is robust to different specifications[3], although the RD estimates are not statistically significant when the dependent variable is not transformed. Estimates for all four models are shown in table 8 and graphical analysis are presented in figure 4.

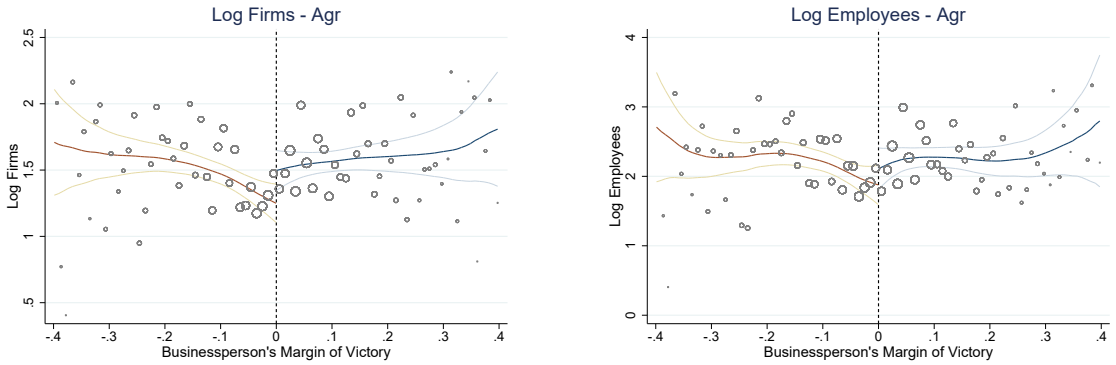


Figura 4 – Effects on log of firms and employees in the towns' agribusiness sector

[3] Results are maintained when using other bandwidth selection methods.

Tabela 8 – RD estimates for the logs of the average numbers of firms and employees in the towns' agribusiness sector

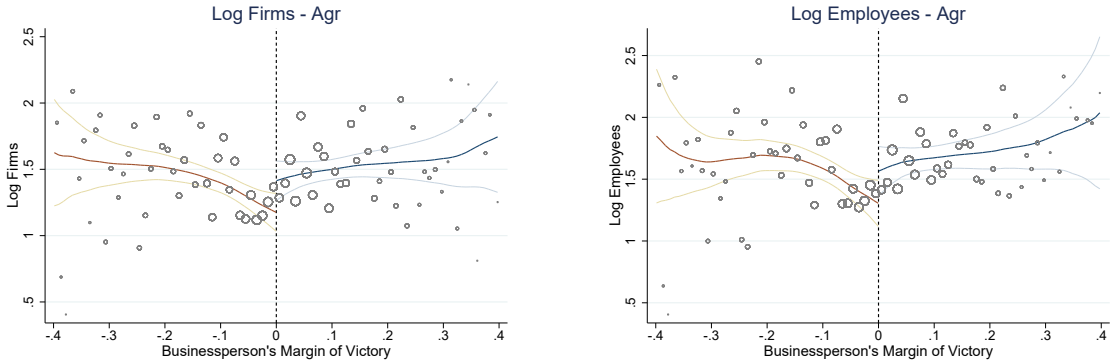
	(1)	(2)	(3)	(4)
VARIABLES	Log Firms	Log Firms	Log Firms	Log Firms
RD_Estimate	0.248**	0.213**	0.235*	0.224*
	(0.107)	(0.0931)	(0.143)	(0.125)
Observations	1,645	1,644	1,645	1,644
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.220	0.220	0.273	0.273
BW Right	0.220	0.220	0.273	0.273
VARIABLES	Log Employees	Log Employees	Log Employees	Log Employees
RD_Estimate	0.237	0.177	0.0505	0.0404
	(0.207)	(0.191)	(0.289)	(0.270)
Observations	1,645	1,644	1,645	1,644
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.162	0.162	0.182	0.182
BW Right	0.162	0.162	0.182	0.182

Log Firms and Log Employees are the logarithm of the averages of the numbers of firms and employees, plus one, during the legislative period. Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

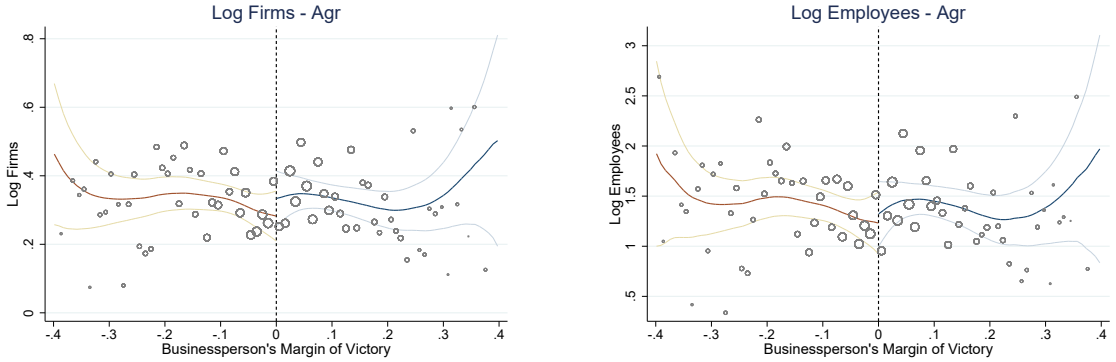
The two local linear regressions give statistically significant RD estimates at the 95% confidence level. Results indicate an increase of about 21-25% in the number of agribusiness firms - which represents between 1.4 and 1.7 companies more, for towns within the bandwidth - relative to towns where non-businesspeople win the race. In regard to the average number of employees, as the absence of a significant jump at the cutoff in the second graph indicates, there are no statistically significant results.

Lastly, firms are also divided into two size categories. The small companies group contains all the ones with up to 9 employees in the current year and represent roughly 62% of the total

number. While the other 38% compose the group of big companies, in which the number of employees varies from 10 to more than a thousand[4].



(b) Small companies



(d) Big Companies

Figura 5 – Effects on log of firms and employees in the agribusiness sector of small towns, by firm size

Figure 5 exhibits visual analysis of the impact on firms and employees, in small towns' agribusiness sector, by firm size. It presents evidence that the effects come almost entirely from the group of small companies, as there are no apparent discontinuities at the cutoffs regarding big companies.

RD estimates presented in table 9 confirm this evidence, with the first panel showing positive and statistically significant results similar to those obtained when not restricting firms by size. The average number of small agribusiness firms in the towns group increases by 21-24%. The effect represents around 1.28 to 1.47 new business, since small towns within the bandwidth have on average 6.12 firms in this sector.

The second panel presents results for big companies. None of the estimates are significant and for the average number of employees the result is even negative, when using the linear

[4] Nearly 2 thirds of the firms in the big companies group have less than 100 employees, whereas only 2% have 1000+.

Tabela 9 – RD estimates for log of average firms and employees is small towns' agribusiness sector, by firm size

VARIABLES	(1) Log Firms	(2) Log Firms	(1) Log Employees	(2) Log Employees
Small Companies				
RD_Estimate	0.239**	0.210**	0.261*	0.253**
	(0.106)	(0.0921)	(0.141)	(0.127)
Observations	1,645	1,644	1,645	1,644
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	1	1
BW Left	0.213	0.213	0.175	0.175
BW Right	0.213	0.213	0.175	0.175
Big Companies				
RD_Estimate	0.0515	0.0269	0.0910	-0.00198
	(0.0544)	(0.0509)	(0.222)	(0.210)
Observations	1,645	1,644	1,645	1,644
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	1	1
BW Left	0.178	0.178	0.152	0.152
BW Right	0.178	0.178	0.152	0.152

RD estimates of the log of the average number of firms and employees plus one in the towns' agribusiness sector, during the legislative period, by firm size. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

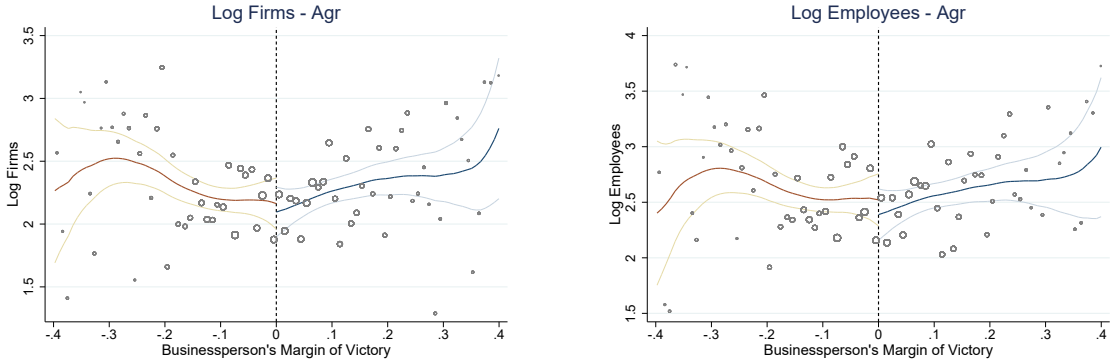
model with all covariates[5].

The lack of a negative effect on the number of firms in both industry and services sectors indicate that it is unlikely for companies already established in the municipality to switch between sectors. Combined with the positive results for the agribusiness sector, this suggests that businessperson mayors do in fact attract more business or make it easier for informal companies to formalize, but only for farms and agricultural producers in small towns. This may

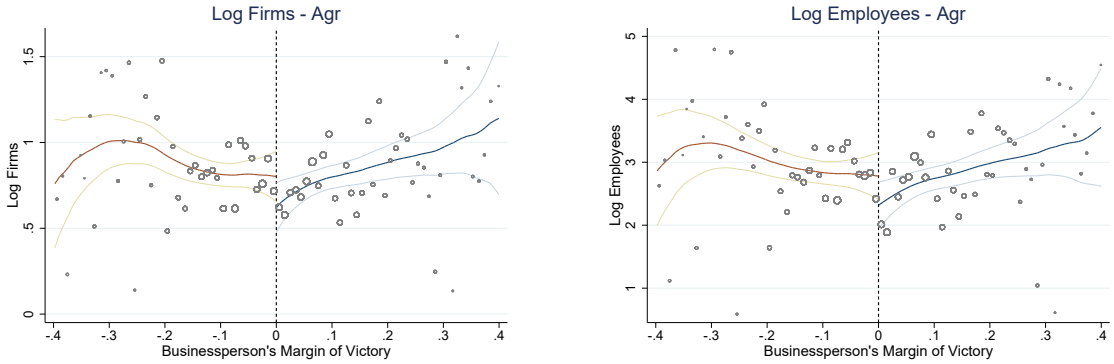
[5] Second order local polynomial regression results give statistically significant results only for the log number of firms, at the 10% level. Estimates for the log number of employees were not significant.

be due to differences between the business experience of country and bigger cities' candidates, which unfortunately cannot be clarified with the TSE's data, since only the occupations are self-reported[6].

Regarding the bigger cities, as they are on average less dependent on federal and state government transfers, mayors should be more capable to implement business-driven policies than mayors in small towns. Also, as cities' economies are usually more diverse it should be easier for them to attract new business. On the other hand, because there are a greater number of firms in these municipalities, an increase of a handful of new companies is much less likely to affect the overall results.



(a) Small companies



(b) Big companies

Figura 6 – Effects on log of firms and employees in the agribusiness sector of cities, by firm size

When looking at both small and big companies in all three sectors, the only evidence of mayors affecting the number of firms or employees in the cities is also in the agribusiness sector. Results indicate that the average log number of firms and employees decrease when considering only large companies. For small firms the estimates are also negative, but not statistically significant.

[6] For example, candidates reporting themselves as entrepreneurs in bigger cities may be more related to high-tech or skilled service companies.

Tabela 10 – RD estimates for log of average firms and employees is cities' agribusiness sector, by firm size

	(1)	(2)	(1)	(2)
VARIABLES	Log Firms	Log Firms	Log Employees	Log Employees
Small Companies				
RD_Estimate	-0.0679	-0.0909	-0.133	-0.148
	(0.149)	(0.121)	(0.175)	(0.148)
Observations	1,644	1,644	1,644	1,644
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	1	1
BW Left	0.176	0.176	0.189	0.189
BW Right	0.176	0.176	0.189	0.189
Big Companies				
RD_Estimate	-0.182*	-0.171*	-0.461*	-0.473*
	(0.106)	(0.0946)	(0.273)	(0.252)
Observations	1,644	1,644	1,644	1,644
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	1	1
BW Left	0.154	0.154	0.208	0.208
BW Right	0.154	0.154	0.208	0.208

RD estimates of the log of the average number of firms and employees plus one in the cities' agribusiness sector, during the legislative period, by firm size. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Visual analysis of the effect are shown in figure 6. There are negative small jumps at $M_{it} = 0$, which are confirmed by the results presented in table 10. It indicates negative and statistically significant impacts at the 90% confidence level. Both estimates show a large effect, with about 46-47% less employees and 17-18% less big agribusiness companies.

5.2 EMPLOYMENT AND WORKFORCE CHARACTERISTICS

Even if mayors from business backgrounds do not affect the overall number of firms and employees, as there is evidence of impact for some specific municipality-size-sector groups,

there still a possibility that they affect employment and workforce characteristics. For example, if the number of agribusiness companies increase, this could lead to a higher demand for country workers and a raise in their average salaries, which in turn may attract more qualified people to the sector. That is, incentives provided by the municipal government can lower average costs for specific firms and affect market dynamics.

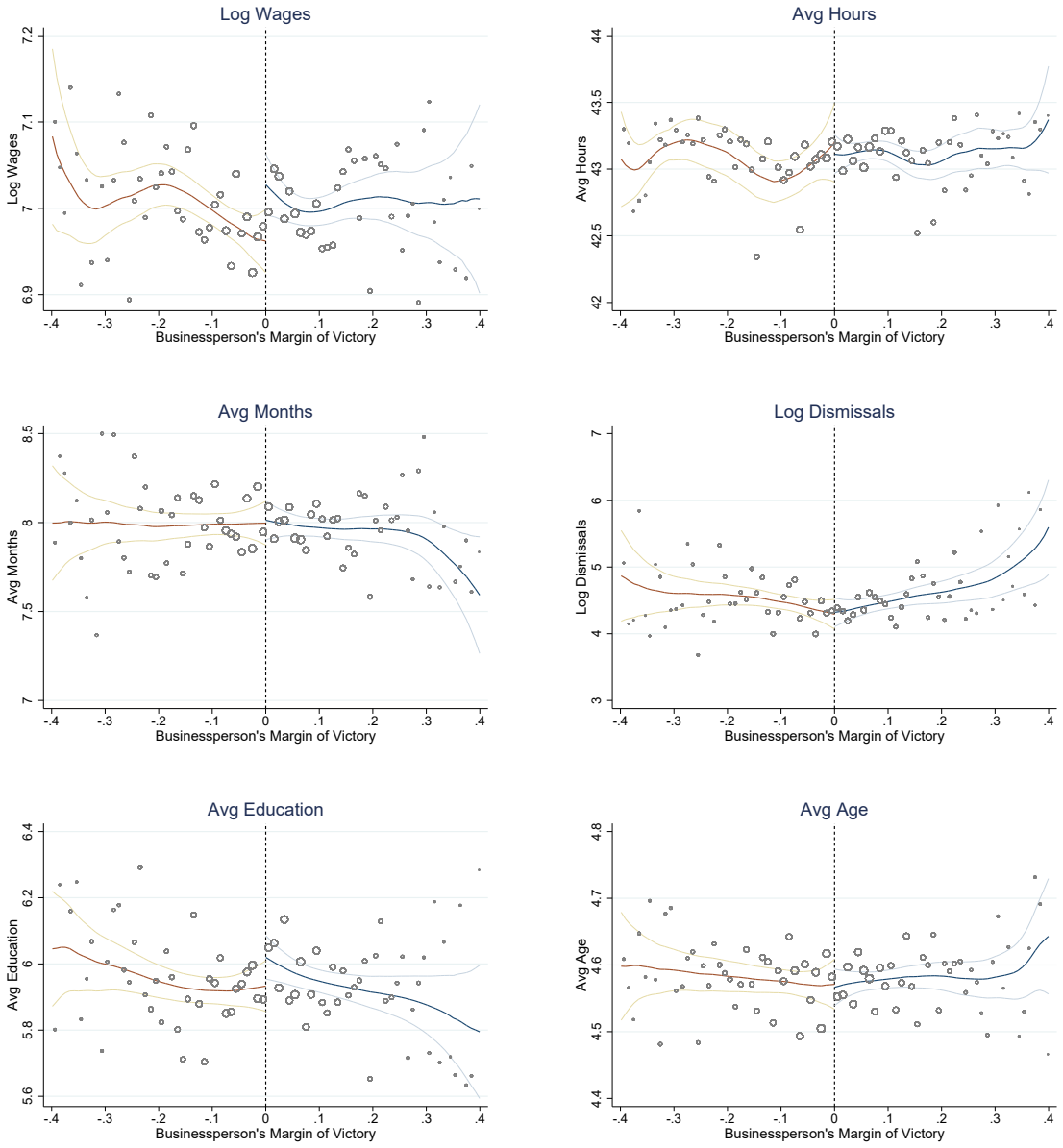


Figura 7 – Aggregate effects on logarithm of wages and dismissals and on average workers' characteristics

The RAIS employees dataset contains yearly information on workers' characteristics such as the level of education, age range[7], contract hours, number of months worked, average monthly wages, and a variable that is equal to the month in which the worker left the firm, or

[7] The age range is described by an 8 scale discrete variable going from 10-14 (1) to 65+ (8) years old.

zero if she did not. This last variable is transformed into a binary indicator if the employment has been terminated in the current year.

As before, the first part of analyzing the impact of electing businesspeople on employment and workforce characteristics involves looking at the effects at the aggregate-level. For this section only the employees in the three business sectors described earlier are considered. They concentrate nearly 95% of all workers in the data.

Tabela 11 – Aggregate RD estimates for log of wages and average education

	(1)	(2)	(3)	(4)
VARIABLES	Log Wages	Log Wages	Log Wages	Log Wages
RD_Estimate	0.0655**	0.0526**	0.0691**	0.0621***
	(0.0261)	(0.0207)	(0.0290)	(0.0237)
Observations	3,288	3,287	3,288	3,287
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.138	0.138	0.257	0.257
BW Right	0.138	0.138	0.257	0.257
VARIABLES	Avg Education	Avg Education	Avg Education	Avg Education
RD_Estimate	0.0870*	0.110**	0.104	0.135**
	(0.0504)	(0.0493)	(0.0665)	(0.0652)
Observations	3,289	3,288	3,289	3,288
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.232	0.232	0.291	0.291
BW Right	0.232	0.232	0.291	0.291

RD estimates of the log of monthly wages and the average education level, during the legislative period. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Unlike the number of firms and employees, this time there is evidence of effects - independently of firms' size and sector or the size of the municipality -, as presented graphically in figure 7. Mayors from business backgrounds lead to increases in the average salary and in the

average level of education of workers, though the amount of months and hours worked, the number of contracts terminated and the employees' average age do not vary significantly.

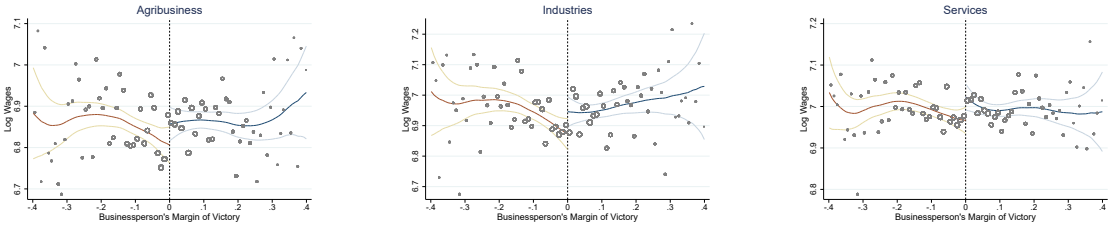
Table 11 shows the RD estimates for the impact on the average log of monthly wages and the average education level of employees(results for the other employees' characteristics are omitted for brevity as none yield statistically significant estimates). Victories from businessperson candidates lead to a raise of between 5% and 7% in the average salary and an increase in average education by 0.1. The education variable in the RAIS employees dataset is measured by a discrete scale of 1 to 11 - with 1 being illiterate and 11 meaning the worker has a PhD - and the average for all workers in the sample is 5.94 (complete primary education).

On a less aggregate level, graphical analysis while separating business by activity, displayed in figure 8, indicate that the effect on wages is higher for the services sector, but workers on the agribusiness and industry sectors also seem to be positively affected. There is no evidence of effects regarding the number of hours contracted, as is the case for the number of contracts terminated and the workers' age range. The average level of education appears to rise only in the agribusiness and industry sectors, while the average number of months worked per year seems to increase for the industrial companies.

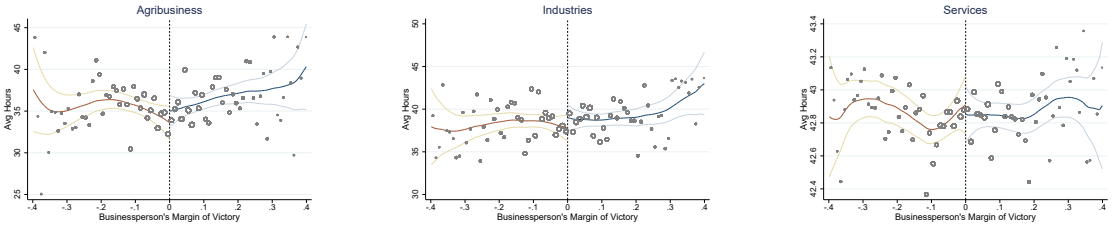
Tabela 12 – RD estimates of employment and workforce characteristics, by sector

	Log Wages	Hours	Months	Log Terminations	Education	Age
Agribusiness						
RD_Estimate	0.0356	1.158	0.162	-0.208	0.424**	0.140
	(0.0257)	(1.369)	(0.273)	(0.170)	(0.171)	(0.156)
Observations	2860	3287	3287	2746	3287	3287
BW	0.181	0.159	0.173	0.145	0.134	0.173
Industry						
RD_Estimate	0.0548*	0.379	0.226	-0.0137	0.167	0.0502
	(0.0284)	(1.060)	(0.235)	(0.162)	(0.146)	(0.116)
Observations	3049	3287	3287	2987	3287	3287
BW	0.158	0.160	0.150	0.163	0.159	0.162
Services						
RD_Estimate	0.0458**	-0.0807	-0.0176	0.128	0.0670*	-0.00513
	(0.0192)	(0.105)	(0.0735)	(0.105)	(0.0355)	(0.0198)
Observations	3286	3287	3287	3277	3287	3287
BW	0.140	0.104	0.148	0.162	0.186	0.133

All estimates were calculated using model 2. Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

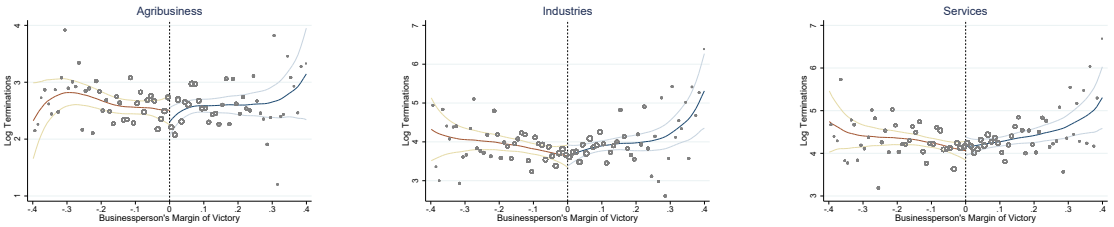


(a) Average log of monthly wages

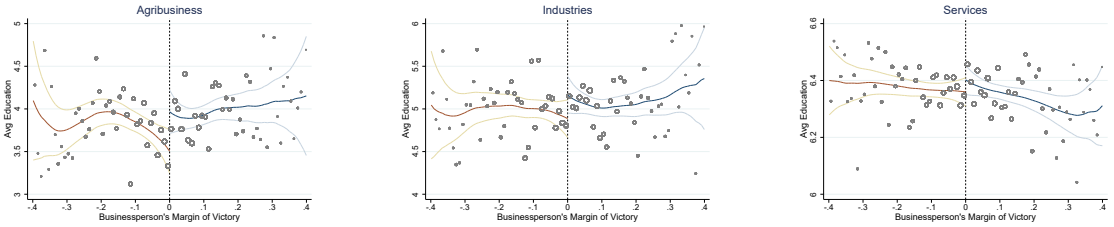


(b) Average hours contracted

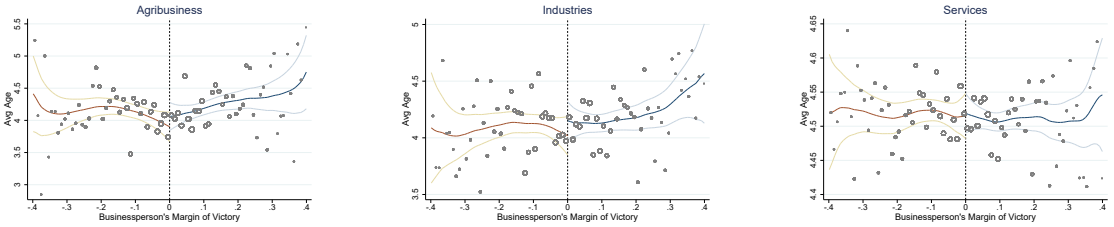
(c) Average months worked per year



(d) Average log of terminations



(e) Average workers' education level



(f) Average workers' age range

Figura 8 – Effects on logarithm of wages and dismissals and on average workers' characteristics, by sector

Regression discontinuity design estimates using the linear specification with all covariates (model 2) confirm some of those evidences, though most results are not statistically significant[8]. Table 12 shows that there is a positive effect on wages for both industries and services, but not for agribusiness firms. Also, the average education level of workers increase both in the services and farming and agriculture companies.

The effects on wages are similar to those estimated for the aggregate-level with the same specification. While for all sectors the increase is of 5.26%, separating results give 5.48% and 4.58% respectively for industry and service sectors' workers. In respect to the education level, the impacts of 0.42 and 0.067 represent jumps of more than 10% and 1% relative to the mean for each sector, respectively.

Tabela 13 – RD estimates of wages and education level, by sector and municipality size

	Log Wages			Education		
	Agr	Ind	Serv	Agr	Ind	Serv
Towns						
RD_Estimate	0.0503	0.0231	0.0452	0.357	0.220	0.0594
	(0.0369)	(0.0351)	(0.0279)	(0.238)	(0.212)	(0.0623)
Observations	1351	1465	1642	1643	1643	1643
BW	0.177	0.165	0.129	0.152	0.154	0.141
Cities						
RD_Estimate	0.00675	0.0607	0.0320	0.243	0.159	0.116**
	(0.0316)	(0.0428)	(0.0235)	(0.186)	(0.184)	(0.0470)
Observations	1509	1584	1644	1644	1644	1644
BW	0.240	0.147	0.176	0.192	0.159	0.154

All estimates were calculated using model 2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Finally, restricting the analysis to the groups of towns and cities[9] yields non-significant results for almost all estimates, probably due to higher standard errors given that the number of observations decreases by roughly 50%. Table 13 shows that, despite not statistically significant, the estimates for the effect on the average log of wages are positive for all sectors and sizes. Regarding the education level, again all estimates are positive, but the effect is only

[8] The two local polynomial regressions of the second order give similar results, but also show a negative impact on dismissals for the agribusiness sector.

[9] As with the companies dataset, "towns"are defined as the municipalities with population size equal to or below the median, and "cities"are the ones in which the opposite occurs.

significant for the services sector in the 50% biggest municipalities.

CONCLUSION

This work provides evidence of the impacts of electing candidates from business backgrounds for mayor on local business environment, in Brazilian municipalities.

Despite some of most famous businessperson candidates' pro-business rhetoric, there is not much evidence that they affect the local business environment of municipalities when elected for mayors. For the bigger cities in the sample (which includes more than a hundred municipalities with 100,000+ inhabitants and twelve with over 500,000) if anything, there is a negative effect regarding the average number of firms and employees. No evidence of changes for any business sector or company size were found. While all estimates have negative sign, only for the big agribusiness companies the decrease is statistically significant at the 10% level. In small towns with less than 12,000 inhabitants, the RD estimates yield positive results, but mostly non-significant nevertheless. Again, only the agribusiness sector seems to be affected, though this time the impact is positive for small firms, as their number increases by around 21-25%.

With respect to wages and average workforce characteristics, on the other hand, there is evidence of a positive effect at the aggregate-level. However, as the number of observations falls by nearly half when separating municipalities by size, the results become non-significant and it is not possible to assess if they are higher in small towns or in the cities. Analyzing business sectors separately indicates that the effect on salaries come from both industry and services sectors, while there seems to be and increase in the average education level of workers in services and agribusiness firms.

Since there is no change in the number of employees, there may be something else affecting the average salaries. Further research could investigate if there is an increase in firms' productivity or if elected businesspeople offer more incentives, thus reducing costs for new business, for example. Also, further analysis may address the differences in candidates' business experience between small towns and bigger cities. It is possible that candidates from smaller municipalities are closer to firms in the farming and agriculture sector, as opposed to high-tech and more sophisticated services and manufacturing. Like some works argue, part of the reasons why businesspeople run for office in the first place is to guarantee that their interests are represented.

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APÊNDICE A – APPENDIX A

Tabela 14 – Balance tests for log of firms and employees

	(1)	(2)	(3)	(4)
VARIABLES	Log Firms	Log Firms	Log Firms	Log Firms
RD_Estimate	0.0505	0.0833	0.0382	0.0269
	(0.117)	(0.0792)	(0.146)	(0.106)
Observations	3,289	3,288	3,289	3,288
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.158	0.158	0.223	0.223
BW Right	0.158	0.158	0.223	0.223
VARIABLES	Log Employees	Log Employees	Log Employees	Log Employees
RD_Estimate	0.0719	0.0752	0.0636	0.0196
	(0.174)	(0.121)	(0.218)	(0.163)
Observations	3,283	3,282	3,283	3,282
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.162	0.162	0.227	0.227
BW Right	0.162	0.162	0.227	0.227

RD estimates of the log number of firms and employees, one year before treatment. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Tabela 15 – RD estimates for number of firms and employees

	(1)	(2)	(3)	(4)
VARIABLES	Firms	Firms	Firms	Firms
RD_Estimate	-135.9	-61.13	-105.3	-66.93
	(100.9)	(44.05)	(118.4)	(57.67)
Observations	3,289	3,288	3,289	3,288
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.104	0.104	0.132	0.132
BW Right	0.104	0.104	0.132	0.132
VARIABLES	Employees	Employees	Employees	Employees
RD_Estimate	-561.4	-303.4	-545.0	-482.1*
	(635.9)	(201.8)	(732.2)	(252.9)
Observations	3,289	3,288	3,289	3,288
BW Type	mserd	Manual	mserd	Manual
Kernel	Triangular	Triangular	Triangular	Triangular
Covariates	No	Yes	No	Yes
Plynomial Order	1	1	2	2
BW Left	0.0862	0.0862	0.0923	0.0923
BW Right	0.0862	0.0862	0.0923	0.0923

RD estimates of the log number of firms and employees, during the legislative period. Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Tabela 16 – Companies' activity sector classification

CNAE first two digits	Sector
≤ 03	Agribusiness
≥ 05 & ≤ 09	Industry
≥ 10 & ≤ 33	Industry
≥ 45 & ≤ 47	Services
≥ 49 & ≤ 53	Services
≥ 55 & ≤ 56	Services
≥ 58 & ≤ 63	Services
≥ 64 & ≤ 66	Services
≥ 68 & ≤ 75	Services
≥ 77 & ≤ 82	Services
≥ 84 & ≤ 88	Services
≥ 90 & ≤ 97	Services
99	Other
≥ 35 & ≤ 39	Other
≥ 41 & ≤ 43	Other