



Marcos Paulo Ferreira Duarte

**Political Connections and Public Procurement:
Evidence from Brazil**

Dissertação de Mestrado

Master's dissertation 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. Renata Del Tedesco Narita

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Prof. Renata Del Tedesco Narita

Advisor

Departamento de Economia – PUC-Rio

Prof. Raphael Bottura Corbi

Universidade de São Paulo

Prof. Valdemar Pinho Neto

EPGE/FGV

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Marcos Paulo Ferreira Duarte

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To my parents, for their support
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Abstract

Duarte, Marcos Paulo Ferreira; Narita, Renata Del Tedesco (Advisor). **Political Connections and Public Procurement: Evidence from Brazil**. Rio de Janeiro, 2025. 71p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

This study investigates the impact of political connections established through electoral windows via corporate campaign donations on the dynamics of public procurement. The timing and proximity of such donations open avenues for closer relationships between politicians and firms, potentially fostering conditions for favoritism. Using detailed microdata on public procurement from the states of Ceará, Paraná, and São Paulo, this research adopts a Regression Discontinuity Design (RD Design) framework to achieve causal identification. The approach simulates a quasi-random assignment in the donation decision-making process by leveraging competitive elections. I do not find significant evidence of favoritism toward connected firms in the discontinuities of competitive elections.

Keywords

Political Economy; Applied Microeconomics; Development Economics.

Resumo

Duarte, Marcos Paulo Ferreira; Narita, Renata Del Tedesco. **Conexões Políticas e Compras Públicas: Evidências do Brasil**. Rio de Janeiro, 2025. 71p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

Este estudo investiga o impacto das conexões políticas estabelecidas por meio de janelas eleitorais via doações de campanha corporativas na dinâmica das compras públicas. O momento e a proximidade dessas doações abrem caminho para relações mais estreitas entre políticos e empresas, potencialmente favorecendo condições para o favoritismo. Utilizando microdados detalhados sobre compras públicas dos estados do Ceará, Paraná e São Paulo, esta pesquisa adota um modelo de Regressão com Descontinuidade (RD Design) para alcançar a identificação causal. A abordagem simula uma alocação quase aleatória no processo de decisão de doação, aproveitando eleições competitivas. Não encontrei evidências significativas de favoritismo em favor de empresas conectadas nas descontinuidades de eleições competitivas.

Palavras-chave

Economia Política; Microeconomia Aplicada; Desenvolvimento Econômico.

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List of Abbreviations

ATT – Average Treatment of Treated

BD – Base dos Dados (Third Sector Data Provider)

CNPJ – Cadastro Nacional de Pessoa Jurídica (National Registry of Legal Entities)

CPF – Cadastro de Pessoa Física (Individual Taxpayer Registry)

DiD – Difference-in-Difference

GDP – Gross Domestic Product

IBGE – Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics)

IPCA – Índice de Preços ao Consumidor Amplo (Extended National Consumer Price Index)

LATE – Local Average Treatment Effect

RAIS – Relação Anual de Informações Sociais (Annual Social Information Report)

RDD – Regression Discontinuity Design

TCE-CE – Tribunal de Contas do Estado do Ceará (Ceará State Court of Accounts)

TCE-PR – Tribunal de Contas do Estado do Paraná (Paraná State Court of Accounts)

TCE-SP – Tribunal de Contas do Estado de São Paulo (São Paulo State Court of Accounts)

TFP – Total Factor Productivity

TSE – Tribunal Superior Eleitoral (Superior Electoral Court)

WB – World Bank (Banco Mundial)

1

Introduction

Public procurement represents an expenditure magnitude of about 12% of the global GDP (BOSIO et al., 2022). Through it, governments interact with private agents to acquire goods or services. However, these interactions between government and firms can lead to adverse outcomes, such as the capture of government activities for the private benefit of public agents and/or firms. Despite stricter public procurement rules having been institutionalized in various countries to curb potential favoritism, the literature has found evidence in some countries that political connections can be a mechanism for firms to receive privileges (SZUCS, 2023; BRUGUÉS; BRUGUÉS; GIAMBRA, 2022; AKCIGIT; BASLANDZE; LOTTI, 2020; BOAS; HIDALGO; RICHARDSON, 2014). The possibility of privilege opens doors to rent-seeking behavior, where firms seek market advantages outside the mechanisms of market competition. Potential consequences of this include the effects of misallocation in the economy and impacts on firm dynamics¹. Therefore, producing more evidence of the impact of firm-government connections in public procurement is relevant for considering better practices in government negotiations with the private sector and mechanisms for electoral financing of democracy.

I seek to identify the potential effects of connections between firms and politicians in selecting public sector contracts from three Brazilian states - Ceará, Paraná, and São Paulo. Addressing the issue of the incumbent group's advantage in acquiring electoral donations, I use a Regression on Discontinuity Design (RD design) in Close Elections to determine whether there is evidence of firm favoritism. Although positive favoritism effects are observed, the values do not exhibit statistical significance in the RDD analysis. The insignificance applies to the probability of winning a public sector contract, the number of contracts, and the value of contracts in the baseline database. Similarly, no significant effects are found in municipalities experiencing political group turnover. Therefore, within the discontinuities analyzed, there is no evidence to suggest that electoral donations to political campaigns serve as a window of opportunity for rent-seeking behavior. These results remain consistent across variations in the RD design scope.

The primary conclusion is that identifying favoritism through electoral campaigns in Brazil is less straightforward when using discontinuities. How-

¹For examples of the effect of misallocation in the economy, see Hsieh and Klenow (2009), Buera, Kaboski, and Shin (2011) and Restuccia and Rogerson (2017)

ever, this does not mean the electoral process and firm interactions cannot produce privileges. Other dimensions not explored in this study due to data limitations may include shifts in procurement patterns, reduced risk exposure for firms, protection against legal allegations, and regulatory or fiscal benefits. Additionally, the RD Design offers localized and narrow evidence confined to electoral discontinuities. As such, the absence of significant results should not be misconstrued as proof that campaign financing has no adverse effects on economic development and market competition.

The sample is limited to three states and does not comprehensively capture the diversity of patterns across Brazil. Important municipalities with considerable impacts from campaign donations, such as São Paulo, were excluded due to the lack of competitive elections. Large metropolitan areas tend to experience higher resource flows and impose greater financial demands for candidate viability. Furthermore, this study focuses solely on municipal governments. In Brazil, electoral donations also influence other government levels, such as state and federal administrations, which are better positioned to implement large-scale public policies of interest to donor firms, including favorable regulations, tax incentives, and substantial procurement volumes.

Compared to recent literature, the main literature papers seek to identify connections through the labor market. I innovate by using an electoral period as a channel for firm-politician connections. During the electoral process, firms can align with politicians through electoral donations. Receiving money from firms is an important mechanism to enable politicians' candidacy for office. I aim to identify whether the connection between firms and politicians through electoral donations impacts the probability of securing a public sector contract (extensive margin), the number of contracts, and the values of contracts with the public sector (intensive margin).

The primary issue concerning the identification of firms' motivations for donating to electoral campaigns is that these motivations can be of two distinct origins. The first motivation is ideological, where firms choose candidates whose proposals and policies align with their objectives and values. For example, a candidate might present a plan for revitalizing a specific neighborhood and, consequently, receive donations from businesses in that area. In this case, the benefit to the company is not directly generated by its connection with the politician but rather by the outcomes of the implemented policies. The second motivation is rent-seeking behavior, where firms connect with politicians to obtain competitive advantages over other firms. These advantages are not necessarily associated with the firms' quality or performance but rather with their ability to influence political decisions in their favor. Firms acting for

ideological reasons are not necessarily linked to the potential electoral outcome of the candidate. On the other hand, firms engaged in rent-seeking behavior may favor candidates with a higher probability of winning, aiming to secure future benefits. Therefore, considering all connected firms without distinction can introduce bias into the analysis, as stronger candidates might attract more support from firms interested in rent-seeking.

From the candidate's perspective, there is a relationship in the Brazilian political economy that indicates a positive correlation between fundraising capacity and electoral success, at least in the 2008 and 2012 elections, which are the focus of this study. Additionally, the practical costs of an electoral campaign in a majoritarian direct election system require candidates to obtain substantial financial support to increase their popularity and make their campaigns viable. The cost of this popularity increase is higher when other candidates are competitive, demanding even more resources. However, the need for financial resources exposes candidates to the influence of firms with rent-seeking behavior. Thus, mayors face a tradeoff between aligning with the interests of their voters and the necessity to raise funds, which can lead to deviations from their initial proposals to admit favoring firms. In highly competitive elections, the pressure for financial resources is more significant, forcing candidates to seek more firm support, even if it implies accepting rent-seeking behaviors.

Specifications such as Difference-in-Difference group existing connections from both dimensions but with separate relevance distributions. In the control group, consisting of firms with candidates who did not perform well electorally, the presence of firms with rent-seeking behavior can be significantly different when compared to winning candidates. The nature of this difference is that rent-seeking firms have an advantage when they observe the incumbent group and update their beliefs, given the reelection advantage of an incumbent who controls the public machinery. On the other hand, the demand for funds from such firms decreases when the candidate already has broad popularity in a non-competitive race.

The solution of using close elections addresses both issues in RD design framework. First, this solution in close elections simulates an allocation of connections in a quasi-randomized manner. That is the firm places a bet on a candidate. If the candidate is elected, the firm benefits from being connected. However, the firm cannot determine who is more likely to succeed in advance. Thus, we capture, via close elections, firms that make donations only to the winner or the loser, excluding the possibility of resolving uncertainty through mutual donations to the most competitive candidates. Another advantage is

that tight competition can increase the need for connections, as previously mentioned. Therefore, although the estimator is a LATE, a relevant distribution of rent-seeking might be covered.

Answering this question is relevant for designing new regulations and the political debate on the interaction between private firms and governments. From the government's perspective, creating rules that limit the discretion of public agents and, consequently, their ability to create privileges presents a clear tradeoff. Restrictions reduce the speed of action of the public sector and create costs for firms and the government by increasing the steps to finalize contracts. Furthermore, this interaction can also affect electoral contests and, therefore, democracy by giving greater capacity to acquire electoral resources when there is a higher probability of victory due to firms' rent-seeking behaviors.

The Brazilian scenario is promising for answering the question posed in this article. First, Brazil allowed, until 2015², firms to donate to electoral campaigns or political committees. This allows us to use the election as a direct electoral connection channel with firms. Brazil also has administrative databases that provide access to data on public sector contracts with private companies.

Additionally, the legal rules for entering into contracts with the private sector are established at the federal level, and the country has control bodies with operational capacity. There are various models of contracting services or purchasing goods by the government, allowing purchases through more stringent bids, such as open competition and auctions, and purchases without bids which differ in their level of discretion. Evidence suggests that discretion significantly influences pricing and product quality, with less competitive procurement methods (such as no-bid contracts) demonstrating higher product quality (FAZIO, 2022). Understanding whether campaign donations affect this dynamic is crucial for identifying potential risks that discretionary mechanisms may face, depending on the prevailing political institutional environment. Another relevant factor is the size of public procurement concerning GDP in Brazil. About 20% of GDP is spent on public procurement, above the income standard compared to other economies (BOSIO et al., 2022).

Despite the control bodies and the established rules for public procurement, Brazil presents a low index of institutional quality and a high perception of corruption, which may indicate potential weaknesses in the restrictions produced by formal control institutions, allowing rent-seeking behaviors by firms

²In 2015, the Supreme Electoral Court declared corporate donations unconstitutional. Therefore, from the 2016 election onwards, this mechanism of electoral donation by corporations no longer exists.

and the capture of public agents³. Therefore, it is not clear that these restrictions impede the strategic behavior of companies and political agents.

Thus, I use the municipalities of the states of Ceará, Paraná, and São Paulo for the analysis. The selection of a specific state stems from the difficulty of obtaining accurate data from the State Courts of Accounts (TCEs) harmonized across periods. Therefore, I use budget execution information and/or bidding processes for the municipalities of these three states⁴. This administrative data provides all purchases of goods and services, identifying the company's CNPJ, contract value, type of procurement, and payment period for the service. I use the time frame from 2009 to 2018. For electoral data, I use the election results and campaign donation data provided by the Superior Electoral Court (TSE) for the 2008 and 2012 elections. I complete the sample with additional information from various sources, such as *Relação Anual de Informações Sociais* (RAIS), with longitudinal employees-employer database on the formal sector, and other supplementary data sources on establishments, GDP, and population.

This document is structured as follows: Chapter 2 reviews previous work relevant to the problem. Chapter 3 provides the institutional background. Chapter 4 describes the final database. Chapter 5 outlines the RD Design strategy. Chapter 6 shows the results of RD Design. Chapter 7 presents the discussion. Finally, Chapter 8 offers the conclusion and directions for future work.

³For international comparison, there are several metrics for measuring the corruption index. Since corrupt activity, like other crimes, presents data restrictions due to the nature of the behavior, the indices can be both in terms of public perception of corruption and some control metric of corruption based on institutional qualities, both political and anti-corruption. In the first case, we have the Corruption Perceptions Index by Transparency International, which ranks Brazil 96th out of 180 countries regarding the lowest perception of corruption. In the second metric, we have the Control of Corruption Index produced by the World Bank, which uses six governance metrics in the country to establish its index. In this case, Brazil falls to the 121st position.

⁴For São Paulo, I use budget execution data from 2008 to 2018. For Paraná, the results of bidding processes from 2007 to 2018. Ceará combines both sources of budget execution and bidding process results. Budget execution provides a comprehensive overview of all budget expenditures, whether through bidding processes or not. This includes, for example, payments of benefits to individuals and other details.

2

Literature Review

About the literature, this paper discusses corruption and/or deviant behaviors in the public sector, which are not necessarily criminal. Combating corruption in governments has been a topic of various debates and the formulation of international agreements over the past three decades¹. From the perspective of economic literature, this concern is justified. Corruption can be one of the explanatory variables for market friction. Through regulation and market relations, the public sector can produce privileges for firms and individuals and, consequently, induce inefficient economic allocations. Inefficient allocations can explain significant TFP differences between economies (example Hsieh and Klenow (2009)). Another possible mechanism for corruption to negatively affect economic development is the expropriation of resources by individuals, restricting the public sector's budget.

Despite attempts to produce measures of corruption across countries to identify its effects, these measures have been the target of various criticisms. From the perspective of a general measure of corruption, perception metrics have faced considerable questioning regarding their potential biases (see Olken and Pande (2012) for a review of measurement issues). Biases can occur because corrupt activity is more perceptible when it affects prices rather than quantities, making the activity less noticeable for different criminal attitudes. Additionally, education is an important variable in assessing the existence and degree of corruption. Since human capital decisions are heterogeneous across countries, this can introduce bias in the analysis. A solution addressed by various studies is to focus not on the measure of corruption but on the policies implemented and behaviors of the public sector, such as benefiting the hiring of employees through political connections or the effects of audit policies on government contracts (FERRAZ; FINAN, 2011; COLONNELLI; PREM, 2022).

From the literature perspective, the connection between firms and governments does not necessarily produce adverse effects. This connection and its potential effects on the selection of contracted firms can help select better firms in environments with imperfect information (OLKEN; PANDE, 2012).

¹Markers of this shift can be seen in the emergence of multilateral agreements, such as those from the Organisation for Economic Co-operation and Development (OECD) - produced in 1997 with updated anti-corruption recommendations in 2009 and 2016, ratified by 38 member countries and other countries, such as Argentina, Brazil, Bulgaria, Peru, Russia, and South Africa - and the 1997 United Nations (UN) conventions through UNODC

Although this behavior is not necessarily a market efficiency reducer from a theoretical perspective, evidence generally identifies adverse effects or correlations between efficiency and corruption. On the negative side, as the state is an important regulator and consolidator of institutions, public-private interaction can distribute power in economic activity. This relationship between the public sector and economic activity is widely documented in economic literature. While part of the debate identifies factors that justify the presence of the state in the economy, the literature has identified possible strategic behaviors to benefit political groups and/or certain companies related to public sector interventions. In addition, there are negative correlations between the state's presence in banking activity and institutional quality and the quality of companies linked to the public sector (LA PORTA; LOPEZ-DE-SILANES; SHLEIFER, 2002; DINÇ, 2005; MICCO; PANIZZA; YANEZ, 2007; SAPIENZA, 2004).

The capture of the state by private interests can be a source of allocation problems, as spending is directed based on political affinity. For more direct impacts between corruption and impacts on firms, impacts on the provision of public goods and services, price effects, market distortions, and the reduction of the state's capacity to produce positive externalities, see Olken and Pande (2012). As part of the income differential between countries can be linked to allocation problems², the consequences of these potential allocative problems generated by institutional political conditions can have a high impact on the economic development of cities.

Other studies highlight the importance of the issues addressed in this paper. First, Szucs (2023) shows that changes in discretion in public sector contracting in Hungary produce a discontinuous distribution around the threshold. This evidence indicates signs of manipulation by some agencies to obtain contracts with greater discretion. Furthermore, this study estimates through a parametric model that the demand for discretion is associated with the existence of firms with political connections in the market. Thus, agencies would be willing to sacrifice part of the contract value when dealing with a more connected sector, providing evidence of possible favoritism. The evidence from this study aligns with the context of Italy analyzed by Coviello, Guglielmo, and Spagnolo (2022), but for Italy, the authors also find effects on some contract characteristics, such as increased delivery delays, changes in firm profiles, and a reduction in the number of bidders.

In another study, focusing more on political connections, Brugués, Brugués, and Giambra (2022) shows the effects of the connection between

²For examples of work with this evidence, see Hsieh and Klenow (2009), Buera, Kaboski, and Shin (2011), and the literature review by Restuccia and Rogerson (2017) for references on the impact of misallocation

the bureaucracy of Ecuador and the employment of shareholders or their relatives as bureaucrats. They identify that this connection increases the associated firm's probability of winning a contract by 2.6 percentage points. However, these connected firms are less productive than the more connected ones. Based on this, the authors estimate the welfare impact of public procurement influenced by political connections. In this estimation, the authors find that political connections produce a negative welfare effect of 2% to 6% of the public procurement budget. These effects indicate that rent-seeking effects dominate the informational effects that connections can generate.

Moreover, the beneficial effects of political connections tend to be concentrated in static models. Developing a dynamic model, Akcigit, Baslandze, and Lotti (2020) creates a model to understand the dynamic effects of political connections on firm dynamics. Using the model and an RD design for the context of Italy, they find that political connections, established through the employment of a local politician at some point, are widespread in the Italian market. A result found for close elections is that firms associated with the winners tend to have higher growth in size despite no changes in productivity. This indicates the possible benefits of connections through rent-seeking, as there are benefits without links to productivity.

The literature on political connections in the Brazilian context provides evidence that such connections are significant in multiple dimensions: in securing government contracts when involving federal-level ties, in accessing credit through public banks, in shaping local market dynamics, and in São Paulo state's construction industry context (BOAS; HIDALGO; RICHARDSON, 2014; TABAJARA, 2019; GUERRA, 2023; SCHNEIDER, 2024). These dimensions do not exhaust the subject of political connections in Brazil, as a substantial part of the question remains unanswered. In a municipal setting - where Brazilian oversight bodies have weaker monitoring capacity and less informational transparency - mayors may play a crucial role in understanding the effects of permitting corporate campaign donations.

This article differs from the classical work by Boas, Hidalgo, and Richardson (2014), who found positive effects on contract returns for firms connected to the Workers' Party (PT) following the 2006 election. There are two key methodological distinctions between this study and Boas, Hidalgo, and Richardson (2014). Their study employs a Regression Discontinuity (RD) design to identify connections via elected versus non-elected federal deputies within coalitions. The authors find positive effects of political connections only for deputies from the same party as the president (PT), with no similar effects for other parties. Here, I propose to conduct this investigation for mayoral elec-

tions, as mayors have greater capacity to manage public policy than legislative representatives.

Second, the election analyzed by Boas, Hidalgo, and Richardson (2014). was a highly specific one, featuring an incumbent candidate with high popularity seeking re-election. In addition, particular factors, such as corruption scandals involving the administration, may have made the PT more susceptible to rent seeking firms, as the party needed to expand its influence in the national congress. Thus, their results could be influenced by unique characteristics of the 2006 election, where the government's need to strengthen its political power coincided with an incumbent enjoying a significant advantage. In this context, there may have been a concentration of rent-seeking firms during this particular political juncture. Examining cases like municipal elections mitigates the issue of election-specific biases and provides a clearer understanding of the general effects of political connections between politicians and donor firms.

In addition to these studies, our paper engages with the literature on corruption and accountability in Brazil, which has produced evidence of positive effects in combating corruption and created estimates to measure the magnitude of corruption in Brazilian municipalities. Part of these studies uses the randomization of an anti-corruption program that audited municipal accounts (FERRAZ; FINAN, 2011; AVIS; FERRAZ; FINAN, 2022; COLONNELLI; PREM, 2022). In Ferraz and Finan (2011), there is an identification of the effect of this policy on elections, reducing the level of corruption, especially among mayors seeking re-election. In Avis, Ferraz, and Finan (2022), using the same randomization, there is an 8% reduction in corruption in audited municipalities compared to control group municipalities. Additionally, they find evidence of imperfect information as a mechanism to justify that the rent-seeking effect is not short-term - along with spillover effects on neighbors and party networks. The interaction between firms and the public sector is presented in Colonnelli and Prem (2022). Using the same random audit experiment from the anti-corruption program, the authors use data from the *Relação Anual de Informações Sociais* (RAIS) and other data sources. They find that, on average, there is a 0.9% increase in firms three years after the intervention in treated municipalities.

Additionally, they find the effects of municipal account audits in sectors with the most public sector relationships: sectors with higher participation in public procurement and sectors most involved in irregularities described by auditors. Thus, there is evidence that public procurement can be a channel for irregularities. The authors also identify that the anti-corruption program

increased local economic activity, raising the number of firms in treated sectors and the number of sales and credit in the region, highlighting the harmful effects of corruption on firms. Therefore, a broad literature on the positive effects of combating corruption and institutional controls on these practices shows that rent-seeking relationships can be detrimental to economic activity.

From the perspective of public-private sector relationships, besides the above evidence regarding firms, there is also evidence that political connections can influence the likelihood of public-sector hiring. Using RAIS and Superior Electoral Court (TSE) data, Colonnelli and Prem (2020) identify, through an RD design strategy, that individuals connected to elected mayors, either through donations or party affiliation, have a 47% higher chance of being hired. These results show that, despite Brazil's modern and typically meritocratic hiring institutions based on career competitions, politicians still have degrees of discretion when choosing bureaucratic workers, especially for contracts that do not depend on public competition.

These results also suggest that controls on public procurement may be limited. However, unlike these studies, I find no significant effects of electoral connection on public procurement. That are typically different from those reported in more related works, such as Boas, Hidalgo, and Richardson (2014), Tabajara (2019), GUERRA (2023), Brugués, Brugués, and Giambra (2022), Coviello, Guglielmo, and Spagnolo (2022), Szucs (2023) and Colonnelli and Prem (2020, 2022).

3

Institucional Background

3.1

Public Procurement in Brazil

A national law, Law 8.666/93, coordinates the Brazilian public procurement system. According to Article 22, public procurement includes the following bidding schemes: competition, price taking, invitation, contest, and auction. These procurement methods have specific regulations that establish institutional parameters to restrict the discretion of relationships between the Executive Power and the private sector when seeking services from the latter. The legislation creates barriers to the behavior of politicians and public administration to protect the public budget from possible undue favoritism.

However, two highly discretionary modalities do not require competition procedures and direct dispute. These occur in "Dispensa de Licitação" (bidding waiver) or "Inexigibilidade". These two formats allow the public sector to make purchases more quickly and select their products better.

It is possible to subdivide these purchasing categories in terms of discretion. Table A.1, available in the Appendix, has three divisions: High, medium, and low. I identify that contracts with bidding waivers and ineligibility have the most discretion. These cases and invitations are understood as procurement mechanisms with a higher risk of favoritism. Despite the bidding process, the invitation modality only requires the public sector to invite three companies to participate in a dispute. Thus, the government can select a pool of companies with close ties.

Finally, the procurement methods are classified by risk type. Among the High-Risk methods are "Inexigibilidade", waiver of bidding, invitation, and RDC¹. Competition and competitive bidding are defined as Medium Risk. Lastly, "Pregão" and auction are considered to have more constraints on favoritism behavior, reducing their associated risks.

Control bodies oversee Brazilian municipalities and can use federal government systems to conduct specific procurement processes. The central control bodies are the State and/or Municipal Courts of Accounts (Tribunais de Contas). These are independent courts with boards appointed by the executive

¹The RDC procurement method (Regime Diferenciado de Contratações) was created to streamline and expedite the procurement process, particularly for large infrastructure projects, such as those related to the World Cup, Olympics, and other significant events. It aims to reduce bureaucracy and increase efficiency in public procurement.

branch and approved by the legislative branch of the respective states and/or municipalities. The judging councils are collegial; however, they cannot oversee all procurement contracts produced.

3.2

Municipalities Elections and Donations

The current electoral rules in Brazil involve simultaneous elections for Mayors (Prefeitos) for the Municipal Executive Power and Councilors (Vereadores) in local City Councils. These regulatory definitions are set at the federal level and apply to all Brazilian municipalities. These elections occur every four years and are conducted under different rules. For mayors, the election is held by either a simple majority or an absolute majority. In municipalities with more than 200,000 inhabitants, a second round is held if none of the mayoral candidates achieves an absolute majority. In smaller municipalities, the Mayor is elected by a simple majority. For councilor elections, parties operate under an open-list and single-district system. Each voter selects only one candidate for Mayor and one for Councilor. Many candidates, unlike typical closed-list systems, characterize the elections.

Additionally, Brazil is notable for its extensive party fragmentation, with a large number of parties holding seats in parliaments, accessing party funds and electoral funds, and having media slots for free electoral programs on TV and radio.

Until the Supreme Federal Court ruled unconstitutionality on corporate campaign donations, politicians had access to various funding sources besides using their resources. The first source was public funds allocated to parties for election purposes. The second source was individual donations. Subsequently, corporate donations to candidates were allowed. Corporate donations could also be made indirectly through electoral committees. These electoral committees are relevant for campaign donations and can be subdivided into committees for mayoral elections, councilor elections or unified committees supporting both elections. This group accounted for 22% - 26% of the mayors' revenues, with 31% of these funds originating from private companies during the 2008 and 2012 elections. This data is available in Table A.3 in Appendix.

The Brazilian scenario shows relevant correlations when considering campaign spending and the performance of elected officials. Although not indicative of causality, these results signal to candidates that fundraising capacity is a good proxy for predicting electoral success. In Figure 2.A, available in the appendix, there is a high correlation between winning an election and the number of donations, votes and donations, and the chance

of victory and electoral spending.

4 Data

Electoral Process Generating the final dataset is based on data from electoral donations to candidates and electoral committees not directly linked to councilor elections. The TSE provides this data, which informs the donor's reference document, the CNPJ. From this, the value of the donations associated with this CNPJ and the number of donations made are known.

For committee donation data, donations to an electoral committee in the coalition of the mayoral candidate's parties are considered connected. Electoral committees are institutions that coordinate the campaigns of party-affiliated candidates. They establish strategic guidelines and also organize the collection and distribution of resources. In Brazil, direct donations to electoral committees were significant. Nevertheless, these funds are not entirely bound to the mayoral candidate. However, they serve as an important mechanism for interaction between political campaigns and the private sector, facilitating the establishment of political connections.

In the Brazilian context, it is common to hold elections via coalition. In coalitions, there is an initial attempt to form a political base in case of a definitive election. Therefore, donating to a committee associates the donor with the elected mayor since there is a high chance that this political group receiving the donation will be part of the executive government. This universe and donations to mayoral candidates are considered means of direct connections.

Mutual donors were excluded from the sample, that is, donors who donated to both winners and losers in the same election. This correction is relevant because it is associated with two margins of symmetrical values. In this case, allowing mutual donations increases the risk of similar effects/non-effects of connections.

For the RDD, the estimation is based on a grouping between cycles. The first cycle is related to the 2008 election, encompassing 2009 and 2012. The second period, with the 2012 election, captures the effects between 2013 and 2016.

Establishment I also explore the possibility of indirect connections by using data from the Receita Federal do Brasil, which includes information on establishments and firm partners. This allows for the identification of potential links through shared partners, using the first six digits of the partner's CPF and full name (excluding the last name due to cultural name changes from

marriages and divorces). Additionally, the data provides insights into firm activity and operational timelines. However, given the non-significant results for both direct and indirect donations, this article focuses solely on the scope of direct donations.

Employment RAIS is used to exclude firms without relevant activities. We use RAIS data for the period 2005-2019. This data produces covariates such as salary, number of employment contracts, payroll cost, total contracted hours, and firm age (which interacts with the establishment's opening year information). RAIS determines if the sample will remain in the database by excluding firms with no record during any year of the electoral cycle. If a firm donates in 2012 but has no employment records in 2014, it is removed from the database. The explanation is that including companies that are not active in the analysis cycle introduces negative bias by including in the sample companies that cannot benefit per se because they are not active.

Public Procurement The data used are generated through data collection via the Access to Information Law for the State of Paraná with bidding data, the availability of TCE-SP data on budget execution for the municipalities of São Paulo, except for the capital, which is under the jurisdiction of the São Paulo Municipal Court of Accounts. The data from Ceará are based on the BD/WB partnership source, which maps the procurement data of various Brazilian municipalities. The period from 2008 to 2018 is used in the analysis. The State of Ceará only provides data from 2009 onwards, which does not compromise the cycle analysis but prevents pre-election analysis. Paraná allows analysis from 2007, but its information availability is reduced compared to Ceará and São Paulo data. For all these three cases, the data are generated decentralized, where municipalities send the data to the State Courts of Accounts, which are not responsible for the data set.

There are about 6.2 million year-municipality-CNPJ combinations in the databases. This amounts to 44 million contracts¹ worth R\$ 1.4 trillion from 2008 to 2018, averaging R\$ 134 billion annually, adjusted to December 2022 prices. Within this group of transactions, broad expense groups are not linked to a classic purchase, such as retirement contributions to official pensions, and credit operations, such as debt payments. However, a relevant body of information allows for identifying which purchases are actually linked to public procurement contracts.

Contracts not directly linked to the municipal executive power are excluded. Therefore, both for the State of Ceará and the State of São Paulo,

¹This analysis considers only "empenhado" contracts. The "empenhado" of a contract occurs when the contract receives a budgetary allocation to ensure payment for the contracted activity. This represents the first stage of contract payments in Brazil.

all contracts linked to legislative actions, judicial actions, and "Essential to Justice" expenses are excluded. This exclusion is based on the understanding that the executive power, which is subject to connection, does not have direct jurisdiction to generate advantages in contracts linked to other Constitutional Powers.

The three databases contain information about the bidding modality used to make the public purchase. Thus, the definition of risk is carried out in the three states mentioned earlier. However, other disaggregations are only possible in the State of Ceará and the State of São Paulo. In these cases, purchases can be subdivided into Government Functions (such as health, education, and culture expenses) and Sub-functions of Government (such as medication expenses). These relationships are used in the estimates to analyze heterogeneity between contract modalities.

Socio-demographic and Economic Data Population estimates by municipality from IBGE and municipal GDP from IBGE are used to group the information. Additionally, the IPCA for the year 2022 is used to make monetary corrections for all monetary values in the database, such as electoral donation values, contract values, and labor market information.

Table 4.1 shows the statistics generated from this data aggregation. In this table, we have values at the CNPJ-Cities level. The data linked to RAIS are established based on the root of the CNPJs² and refer to the election years. All values are updated based on the IPCA for the year 2022.

The final data of the number of donors and the municipalities involved differ by year. Thus, there are 8786 CNPJ municipalities, with 3,613 unique companies, divided into 3,545 in the 2008 election and 706 in the 2012 election. That is, there is a group of companies that make donations to more than one municipality. From the municipality's point of view, the two elections aggregate 946 distinct municipalities, with the same 886 in 2008 and 489 in 2012. Despite this, only 407 of these municipalities have at least one close election in the two electoral cycles. The regional distribution of these elections can be analyzed in Figure A.4, Ceará State, Figure A.5, São Paulo State, and Figure A.6, Paraná State, available in Appendix A.

²The identification of companies occurs through the CNPJ, which has 14 digits. The first eight digits refer to the root of the CNPJ. This root aggregates the headquarters of the CNPJ and its branches. Therefore, a company with more than one establishment presents two distinct CNPJs in 14 digits, but the first eight are the same. This generates an aggregation of individual firm data into a unified CNPJ for the same group.

Table 4.1: Sample Statistics and Summary

Variable	Sample Mean	Std. Deviation	Min	Median	Max
Margin of Victory	0.020	(0.281)	-0.9408	0	1
Turnover	0.152	0.359	0	0	1
Probability of Winning a Contracts	0.404	(0.4907)	0	1	1
Number of Contracts	18.18	(156.533)	0	0	8586
Average Payment Term	47.19	(42.242)	0.3125	37.43	637
Value of Contracts	1,159,303	(8,521,305)	0	0	369,701,439
Prob High Risk	0.191	(0.392)	0	0	1
# High Risk Contracts	8.172	(60.8042)	0	0	1612
High Risk Values	114,303.2	(1,260,273)	0	0	46,210,584
Prob Medium Risk	0.039	(0.194)	0	0	1
# Medium Risk Contracts	0.39	(12.535)	0	0	1152
Medium Risk Values	505,208.3	(6,266,152)	0	0	275,561,413
Prob Low Risk	0.158	(0.365)	0	0	1
# Low Risk Contracts	6.66	(123.69)	0	0	7434
Low Risk Values	388,225.8	(3,844,485)	0	0	150,163,802
# Observations	8786	-	-	-	-

Note: # indicates that the variable is presented as a numerical count. Margin of Victory refers to the candidates' victory margin. Turnover represents the proportion of municipalities that experienced changes in political groups. The definitions of High Risk, Medium Risk, and Low Risk are provided in Table B.1.

5 Empirical Strategy

In this paper, I use an RD design based on close elections from two perspectives: intensive margin and extensive margin. For this, I define a contract dummy that will indicate the extensive margin of the analysis. For the intensive margin, I use the number and values of contracts that the donating firms secure. Thus, our database comprises all firms that donated to any mayoral candidate in Ceará, Paraná, and São Paulo municipalities. To estimate the causal effect of the firm's connection with an elected politician, I estimate the following equation.

$$Y_{i \times j, s} = \alpha + \beta \times 1 \{MoV_{i \times j, s} \geq 0\} + \gamma MoV_{i \times j, s} + \theta MoV_{i \times j, s} \times 1 \{MoV_{i \times j, s} \geq 0\} + \Gamma X_{i \times j, s} + \gamma_s + \epsilon_{i \times j, s} \quad (5-1)$$

Where $Y_{i \times j, s}$ is the outcome of interest for firm j in municipality s associated with the mayoral candidate i ¹. I use this model for an intensive and extensive margin in this version. The β is the parameter of interest that will indicate the Local Average Treatment Effect (LATE), the effect of the firm being associated with an elected candidate around the threshold compared to being associated with a loser. The variable $MoV_{i \times j, s}$ identifies the winner's marginal vote share compared to the runner-up when positive. When negative, it is the margin that the losers have compared to the elected candidate. The control variables are the variable $X_{i \times j, s}$. For the main version, I used control variables for the Election Cycle, City (γ_s is municipality fixed effect), and variables indicating significant discontinuity, presented in Table 5.1. Finally, $\epsilon_{i \times j, s}$ identifies the error term.

I follow the classic idea that close elections can be treated as a quasi-experimental event (LEE, 2008). In the main specification, I use a victory margin of up to 5%, and, following recommendations from Imbens and Kalyanaraman (2012), I use a kernel regression weight distribution in the triangular format. This specification increases the weights of variables closest to the threshold. In this version, I can recover the causal effect if I do not find other discontinuities, except in the election categories and in variables influenced by the policy. Furthermore, I follow the recommendations of Cattaneo, Idrobo, and Titiunik (2019) for identifying manipulation tests of the running variable. For a bandwidth of 10% in close elections, I find a p-value of 0.9739 (avail-

¹In the current version, I allow firms to donate to more than one candidate, but it is not allowed to donate to both an elected and a non-elected candidate in the same municipality.

able in Figure D.1 Appendix C). This indicates no precise manipulation of the donor firms' choices. The smaller intervals also show results of no manipulation but present a high confidence interval due to the low number of connected firms very close to the cutoff. In the robustness tests used, controls are expanded to covariates, differential Kernels for the weights of the variables, and alternative methods for bandwidth selection. These issues allow us to ensure that the LATE results are robust despite the limited specification.

For the continuity assumption to be valid, I should not identify clear signs of discontinuities among the covariates found. In Table 5.1, it is possible to identify that for the 0.05 bandwidth adopted in this paper. As a result, they will be subject to controls in the specification presented in Equation 5-1.

In addition, municipalities with turnover are relevant for analysis because they identify situations with a new public administration. This new public administration can lead to changes in existing contracts and shifts in contracting towards connected firms. Hence, I also perform other alternative analyses based on this. First, if the elected candidate does not belong to the incumbent party, I classify the election as an election with party turnover. Also, the candidate does not belong to the party, and the incumbent party is not part of their electoral coalition. I classify the election as an election and also a turnover.

Table 5.1: Covariates Smoothness

Variable	Sample Mean	(I)	(II)
Number of Donations	1.707 [2.13]	0.192** (0.0933)	0.0388 (0.0680)
HHI - Donations	3,541.22 [2,692.87]	272.29** (129.60)	-90.92 (90.07)
Value of Donations (R\$)	48979.08 [123581.65]	-11308.28** (5266.38)	-2410.98 (3207.06)
Value Ratio	0,25 [0.302]	0.028 (0.016)	0.007 (0.011)
Donations Ratio	0.228 [0.263]	0.024 (0.014)	-0.005 (0.0093)
Number of Works	1,983.71 [11394.11]	-1,733.77*** (539.21)	-334.90 (442.58)
Payroll	14,477,104.48 [90,874,074.59]	-14,362,902.85*** (4,310,499.87)	-3,411,976.839 (3,542,865.671)
Total Work Hours	75,699.69 [426161.098]	-64,382.01*** (20,141.15)	-12,265.38 (16,521.17)
Average Salary	2,964.32 [2,372.48]	116.54 (121.72)	229.53*** (80.41)
# Hired Workers	274.46 [1,182.52]	-105.83** (51.75)	32.85 (39.57)
# Dismissed Workers	376.18 [1786.44]	-215.23*** (81.85)	-1.14 (65.56)
Firm Age	8.42 [6.056]	0.773** (0.342)	1.239*** (0.212)
Population	232,691.81 [462,686.87]	-10,106.84 (7,062.084)	209,875.89*** (14,847.96)
GDP (in Thousands)	6,442,693.19 [14,540,785.7]	-12,926.60 (200,468.57)	8,130,079.013*** (528,984.70)
Bandwidth	-	0.05	0.1
# Observations	8768	1599	3374

Note: The table above presents the results of the descriptive statistics of the final variables to test whether the covariates exhibit discontinuity between electoral margins. In a random model, it is expected that the covariates between companies connected to winners and losers would be statistically equal. Since the experiment used is quasi-experimental based on the close election, divergences between covariates may occur. The data are taken only from election years, that is, before the mayor connected to the firm assumes the Executive Power. The values in [] represent the standard deviation of the variable across the entire sample. The values in () represent the standard error of the difference between non-connected and connected companies. Variables for which the difference in means is significant at the 95% confidence level will be used as control terms in the regressions. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6 Results

6.1 Direct Donors

Direct donors are all campaign contributors within a given municipality that are directly linked through their CNPJ to either the winning or losing mayor. Despite observing positive effects on the probability of securing a government contract—approximately 0.05 percentage points in the baseline case and 0.028 percentage points in the turnover scenario—the results are not statistically significant, see Table 6.1. In other words, there is no evidence of significant effects on the likelihood of obtaining a government contract due to political connections.

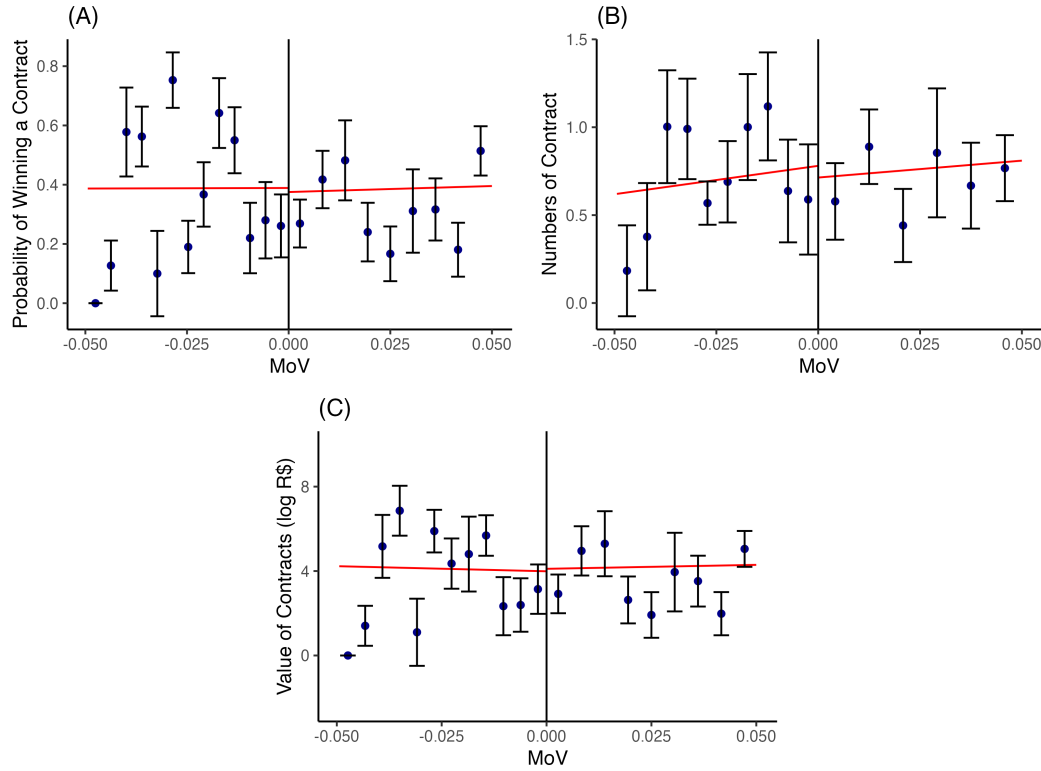
On the intensive margin, the effects observed exhibit differing signs; however, they also remain statistically insignificant for both the Number of Contracts, Table 6.2 and the Total Contract Value, Table 6.3. This result persists across all specifications employed.

The advantage of using the RD Design is also the possibility of presenting the results graphically. The estimation results are reported in Figure 6.1. For better visualization, the bins are chosen based on the IMSE-optimal evenly-spaced method using spacing estimators. Changes in the construction of the bins do not alter the jump in the variables where we find effects. However, they clutter and hinder the perception of trends due to the increase in the number of bins (increase in points). The confidence intervals in each bin are 95%. Therefore, it is possible to observe no significant jumps both in the probability of winning a contract and in contract values.

The interpretation of the results must consider two main aspects. First, as this study employs a Regression Discontinuity Design (RD Design), the estimated coefficient of interest associated with the running variable represents a Local Average Treatment Effect (LATE), meaning the results are localized and specific to the discontinuity point. Therefore, the findings do not allow us to assert that political connections have no effects on public procurement overall. Instead, the results indicate that, within the framework of competitive elections used in this analysis, there is no evidence of direct effects on public procurement.

Second, this study focuses on three specific dimensions of public procurement: the extensive margin, measured by the probability of obtaining a

Figure 6.1: Results for RD Desing specification



Note: The graphs above present the RD Design results in a graphical format based on a linear fit between winners and losers. When $MoV > 0$, the company is associated with a mayoral candidate who was elected. Conversely, when $MoV < 0$, it is associated with a candidate who was not elected. The points represent the mean values of each type of variable, estimated using the bias-corrected local polynomial regression method with robust standard errors adjusted for heterogeneity and cluster dependence. The data are controlled for variables identified as those where the upper and lower margins exhibited statistically significant divergence at the 95% confidence level, as presented in the Covariate Table 5.1. (A) shows the effect on the extensive margin, i.e., the probability of securing a contract between connected winners and losers. (B) displays the differences in terms of the number of contracts, reflecting the intensive margin, with the variable in logarithmic form. (C) presents the results in terms of the total value of contracts, also in logarithmic form, which similarly indicates an intensive margin.

contract, and the intensive margin, represented by the number of contracts and the total value of contracts. Additionally, the use of municipalities experiencing political turnover captures settings where political group changes occurred, implying that political connections shifted to new groups. However, these changes do not result in significant effects.

It is also important to note that this analysis is limited to the municipal level. Brazil has other levels of government, such as state and federal administrations, which command significantly larger electoral campaign budgets sourced from private donations, particularly during the 2010 and 2014 election cycles. The potential impact of political connections at these higher levels of government has not been measured in this study.

Therefore, the primary conclusion of this estimation is the absence of evidence for preferential contracting of firms connected to winning mayors in the analyzed dimensions. Future studies should explore the effects at other levels of government and incorporate additional dimensions of public procurement.

6.2 Robustness

The robustness test indicates that, despite variations in the estimations, the results are consistent with those found in the baseline database: insignificant effects for the probability of winning a contract, the number of contracts, and contract values. These results are presented in Table 6.4. All models include controls based on the covariates identified in Table 5.1, along with municipality-level controls. To analyze the case of municipalities that experienced turnover, the robustness table is available in Table D.1 in the appendix. This table also confirms the stability of the coefficients in terms of significance, further supporting the lack of significant effects from political connections.

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chose a 5% margin of victory in this article as a close election definition. This measure, although common in the literature, is subject to criticism. The alternative bandwidth methods are estimated based on two different models, the MSE-optimal and the CER-optimal, based on Cattaneo, Idrobo, and Titiunik (2019). The reason for not using this profile of choice is that wide bandwidths, as in Panel C of Table 6.4, reduce the ability to argue that the election was truly competitive. A difference of 10 percentage points in electoral terms can typically be significant, especially in single-round elections with simple majority victories. This increases the chance for rent-seeking companies to screen candidates.

The other analysis mechanism is the increase in the order of the polynomials. Increasing the order of the polynomial given the chosen close election definition can lead to overfitting. Furthermore, linear models tend to have more excellent stability in estimation and are more simplified. A good review of the methods used can be found in Cattaneo and Titiunik (2022).

Although the discussion above indicates no qualitative changes when the specification is altered to less arbitrary standards, the overall results indicate no qualitative changes when the specification is altered to less arbitrary standards. Moreover, the specifications using optimization standards are linked to bandwidths with distances similar to the format used as the standard in the article. Therefore, I have more evidence that the estimated betas for the evaluated outcome groups do not show great sensitivity in terms of estimation when using alternative selection methods.

Table 6.1: Probability of Winning a Contract

	Panel A. Baseline Sample			
	(I)	(II)	(III)	(IV)
MoV Dummy	0.157* (0.082)	0.033 (0.048)	0.026 (0.049)	0.023 (0.049)
Bandwidth	0.05	0.05	0.05	0.05
Observation	8713	8713	8713	8713
Eff. Observation	1559	1559	1559	1559
Specification	Linear	Linear	Linear	Linear
Kernel	Triangular	Triangular	Triangular	Triangular
Election Control	NO	NO	NO	YES
Firm Controls	NO	NO	YES	YES
City Controls	NO	YES	YES	YES
	Panel B. Turnover of Political Group			
	(I)	(II)	(III)	(IV)
MoV Dummy	-0.041 (0.13)	0.062 (0.091)	0.034 (0.092)	0.028 (0.094)
Bandwidth	0.05	0.05	0.05	0.05
Observation	2433	2433	2433	2433
Eff. Observation	491	491	491	491
Specification	Linear	Linear	Linear	Linear
Kernel	Triangular	Triangular	Triangular	Triangular
Election Control	NO	NO	NO	YES
Firm Controls	NO	NO	YES	YES
City Controls	NO	YES	YES	YES

Note: The regressions use robust estimation with clustering at the municipality level. Standard errors are reported in parentheses. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6.2: Number of Contrates

	Panel A. Baseline Sample			
	(I)	(II)	(III)	(IV)
MoV Dummy	0.139 (0.196)	-0.032 (0.164)	-0.041 (0.168)	-0.054 (0.165)
Bandwidth	0.05	0.05	0.05	0.05
Observation	8713	8713	8713	8713
Eff. Observation	1559	1559	1559	1559
Specification	Linear	Linear	Linear	Linear
Kernel	Triangular	Triangular	Triangular	Triangular
Election Control	NO	NO	NO	YES
Firm Controls	NO	NO	YES	YES
City Controls	NO	YES	YES	YES
	Panel B. Turnover of Political Group			
	(I)	(II)	(III)	(IV)
MoV Dummy	-0.178 (0.225)	-0.111 (0.192)	-0.118 (0.191)	-0.134 (0.192)
Bandwidth	0.05	0.05	0.05	0.05
Observation	2433	2433	2433	2433
Eff. Observation	491	491	491	491
Specification	Linear	Linear	Linear	Linear
Kernel	Triangular	Triangular	Triangular	Triangular
Election Control	NO	NO	NO	YES
Firm Controls	NO	NO	YES	YES
City Controls	NO	YES	YES	YES

Note: The regressions use robust estimation with clustering at the municipality level. Standard errors are reported in parentheses. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6.3: Value of Contracts

	Panel A. Baseline Sample			
	(I)	(II)	(III)	(IV)
MoV Dummy	1.740* (0.890)	0.451 (0.536)	0.355 (0.550)	0.337 (0.546)
Bandwidth	0.05	0.05	0.05	0.05
Observation	8713	8713	8713	8713
Eff. Observation	1559	1559	1559	1559
Specification	Linear	Linear	Linear	Linear
Kernel	Triangular	Triangular	Triangular	Triangular
Election Control	NO	NO	NO	YES
Firm Controls	NO	NO	YES	YES
City Controls	NO	YES	YES	YES
	Panel B. Turnover of Political Group			
	(I)	(II)	(III)	(IV)
MoV Dummy	-0.308 (1.254)	0.717 (0.879)	0.307 (0.920)	0.246 (0.911)
Bandwidth	0.05	0.05	0.05	0.05
Observation	2433	2433	2433	2433
Eff. Observation	491	491	491	491
Specification	Linear	Linear	Linear	Linear
Kernel	Triangular	Triangular	Triangular	Triangular
Election Control	NO	NO	NO	YES
Firm Controls	NO	NO	YES	YES
City Controls	NO	YES	YES	YES

Note: The regressions use robust estimation with clustering at the municipality level. Standard errors are reported in parentheses. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6.4: Robustness - Test of Sensitivity of RDD estimation

Panel A. Kernel Uniform Function						
	Method	Coef	Std Error	P-value	95% C.I.	BW
Prob of Winning a Contract	Robust	0.048	(0.045)	0.285	[-0.040 , 0.137]	0.05
Number of Contracts	Robust	0.048	(0.045)	0.285	[-0.040 , 0.137]	0.05
Value of Contracts	Robust	0.692	(0.511)	0.176	[-0.309 , 1.694]	0.05
Panel B. Second-Order local polynomial						
	Method	Coef	Std Error	P-value	95% C.I.	Optimal BW
Prob of Winning a Contract	Robust	0.037	0.059	0.528	[-0.078 , 0.153]	0.05
Number of Contracts	Robust	0.023	0.049	0.642	[-0.073 , 0.118]	0.05
Value of Contracts	Robust	0.337	0.546	0.538	[-0.734 , 1.407]	0.05
Panel C. MSE-optimal Bandwidth Selector						
	Method	Coef	Std Error	P-value	95% C.I.	BW
Prob of Winning a Contract	Robust	0.020	0.029	0.487	[-0.036 , 0.076]	0.169
Number of Contracts	Robust	0.017	0.025	0.489	[-0.032 , 0.067]	0.100
Value of Contracts	Robust	0.617**	0.313	0.049	[0.004 , 1.230]	0.085
Panel D. CER-optimal bandwidth						
	Method	Coef	Std Error	P-value	95% C.I.	BW
Prob of Winning a Contract	Robust	-0.012	0.033	0.728	[-0.077 , 0.054]	0.111
Number of Contracts	Robust	-0.008	0.029	0.795	[-0.064 , 0.049]	0.070
Value of Contracts	Robust	0.032	0.369	0.932	[-0.692 , 0.755]	0.059
# Observations						
Controls	Election Controls	Firm Controls	City Controls			
	YES	YES	YES			

Note: The regressions use robust estimation with clustering at the municipality level. Standard errors are reported in parentheses. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

7

Discussion

In this chapter, I analyze the potential impacts of political connections on securing public procurement contracts, focusing on areas characterized by high levels of public service provision. Additionally, I examine the effects of different procurement modalities, evaluating their influence on payment timelines and political connections.

7.1

Social Cost

Although no effects were found regarding direct connections and public procurement across the three analyzed dimensions, verifying whether this result persists when focusing on contracts linked to specific areas of public administration is crucial. In Brazil, municipalities are the primary executors of public policies in health¹, education², and culture. Favoritism in these areas may lead to the underprovision of essential public services. Additionally, these areas concentrate a significant volume of transactions, often involving high-risk procurement categories. To analyze the potential social costs of favoritism, I estimate specification by Equation 5-1 for purchases associated with Education, Health, and Culture.

The results for Education, Culture, and Health are similar to the previous estimates: no positive effects are found for the probability of winning a contract (extensive margin), number of contracts, and value. However, in the case of turnover, there are statistically significant results for Health and Culture in probability. For Culture, connected firms experience a 7.4 p.p increase in the probability of winning a contract. However, this estimator is significant only under the Conventional and Bias-Corrected methods. When Robust estimates are used, the standard error increases sufficiently to render the result insignificant.

For Health, the effects are negative, but not significant for all closed elections. In the case of turnover, these effects also appear in terms of the Probability of Winning a Contracts, with ranging from -5.8 p.p to -8.8 p.p. (Table D.2), Number of Contracts (Table D.3) and the Value of Contracts (Table D.4). There is a significant decline in contract values, suggesting that

¹Including expenditures on primary care, hospital and outpatient care, and prophylactic support

²Including early childhood education

political connections do not necessarily generate beneficial effects for connected firms when there is a change in political leadership.

The divergent results in municipalities experiencing political regime changes indicate that favoritism effects may be heterogeneous in their impact on the public sector. Understanding the motivations behind this heterogeneity and its consequences represents an open avenue for future research to identify mechanisms that drive these distinct procurement outcomes.

Moreover, one of the mechanisms that can compromise the quality of public service provision is the contracting of companies that fail to comply with Brazilian regulations. In Brazil, public procurement is subject to oversight by various institutions, such as subnational *Tribunal de Contas* and the *Tribunal de Contas da União* (TCU). Additionally, entities such as the *Ministério Público* are directly associated with the judiciary. While these institutions are formally independent of fiscal management, it is important to note that members of the *Tribunal de Contas* are often politically appointed, which may lead to potential interference in their operations.

To assess the relevance of these issues, we analyzed data on companies subject to economic sanctions, either in the form of fines or disqualifications from participating in future tenders and contracts. During the analyzed period, 52,987 sanctions were issued nationwide³. These sanctions are generally related to breaches of contract or irregularities in procurement processes. Sanctions can be imposed by public administration entities, the judiciary, or the *Tribunal de Contas*.

Despite the significant number of sanctions applied, the presence of sanctioned companies among electoral donors—whether direct or indirect donors—is low, accounting for less than 1% of all donor companies. This suggests that, from a descriptive perspective, this issue does not appear to be a central aspect of electoral donations.

However, the importance of this discussion lies in the possibility that electoral donations may be used as a bargaining tool to avoid sanctions. Identifying such effects is particularly challenging, as no detailed data on monitoring investigated contracts makes it difficult to assess potential advantages or disadvantages associated with alignment with victorious politicians. This rent-seeking behavior is a relevant topic that warrants further exploration in the economic literature. If sanctioned companies use political connections to

³The data are obtained through the Portal da Transparência. Companies listed in the CEIS (Cadastro de Empresas Inidôneas e Suspensas), CNEP (Cadastro Nacional de Empresas Punidas), CEPIM - Cadastro de Entidades Privadas sem Fins Lucrativos Impedidas, CEAF - Cadastro de Expulsões da Administração Federal; leniency agreements; are part of the total analyzed database. The sanction periods are not reported accurately, which prevents precise analyses of the impact of elections on this process.

evade penalties, this behavior may represent a form of favoritism beyond the scope of this analysis.

7.2

Bidding Modality for Contracts

If, on the one hand, the effects in terms of functions and subfunctions of expenditures in categories highly relevant to municipalities do not indicate apparent favoritism towards firms, understanding whether the contracting format influences the results is fundamental. Brazil employs various contracting mechanisms for service providers and procuring goods from the private sector. These differences can be analyzed in Table B.1, categorizing the contracting modalities into high-risk, medium-risk, and low-risk groups. These classifications are based on the level of discretion granted to public managers in selecting firms during the bidding or public procurement process.

Despite the discontinuities presented in Figure 7.1, there is no significant evidence that the contracting format explains changes in the procurement of goods and services in the public sector. This suggests that, although connections can potentially be leveraged to benefit firms through different contracting mechanisms—mainly where greater managerial discretion is involved—no significant effects are observed at the discontinuity.

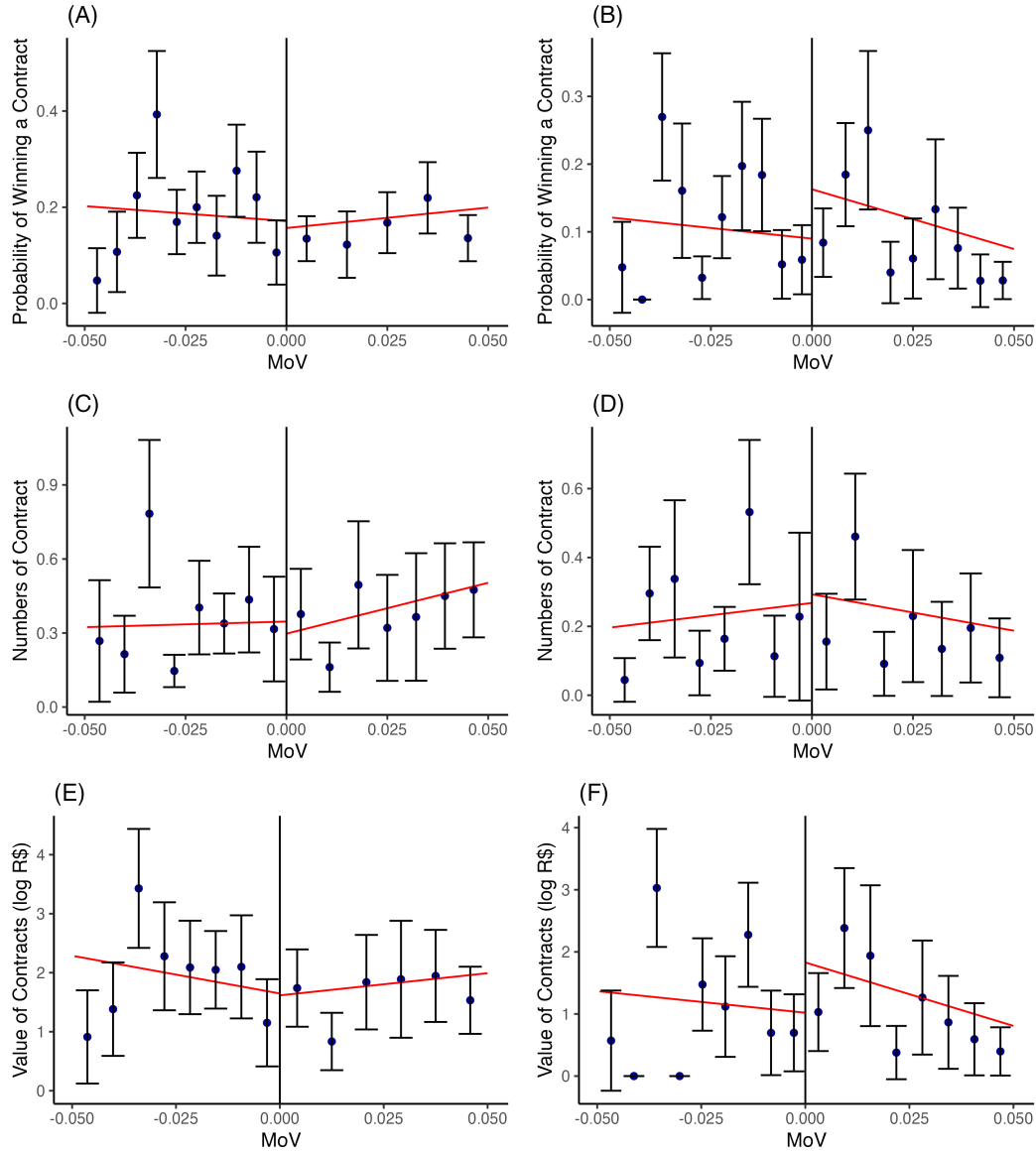
7.3

Risk Channel: payment time

One potential way favoritism may operate in public procurement is through the speed of payment in purchasing processes. In Brazil, the payment process for public procurement is divided into sequential stages. First, the commitment (*"empenho"*) reserves the budget for the expenditure. Next, the liquidation (*"liquidação"*) confirms that the service has been rendered or the goods have been delivered, effectively initiating the payment process. Finally, the payment (*"pagamento"*) represents the funds transferred to the supplier. The total time required to complete this process can be lengthy, imposing significant costs on service providers. For instance, a company may deliver a service but only receive payment months later, creating financial burdens in cash flow management.

From this perspective, favoritism could reduce payment delays, lower the payment risk for firms, and mitigate the need for costly credit to manage operations. This could provide connected firms greater financial security and allow them to submit more competitive or profitable bids. To analyze this dynamic, I use data on payment times for firms within different groups.

Figure 7.1: Results for RD Desing specification



Note: The data are controlled for variables identified as those where the upper and lower margins exhibited statistically significant divergence at the 95% confidence level, as presented in the Covariate Table 5.1; (A) shows the effect on the extensive margin, i.e., the probability of winning a contract with high risk between connected winners and losers; (B) the probability of winning a contract low risk; (C) the analysis presents the impact in terms of the number of high-risk contracts; (D) the effects on the number of low-risk contracts; (E) the effects on the total value of high-risk contracts; (F) and the effects on the total value of low-risk contracts.

However, it is necessary to restrict the sample to companies that were actually involved in procurement processes. Including firms that did not participate in public procurement would lead to a concentration of zeros in the data, falsely suggesting instantaneous payments—which is not the case. As a result, this restriction significantly reduces the sample size, increasing standard errors due to the smaller number of observations.

Unexpectedly, the results reveal increased payment time for firms politically connected to elected mayors. These effects are significant when the model is estimated without controls but lose significance when full controls are included. Table 7.1 presents the regression results using the model without controls (I) and the model with full controls (II). The measure of payment time is calculated as the log of the average time between commitment (*empenho*) and payment for all contracts awarded to the firm during the public management cycle following the electoral process. The results indicate an increase 19.6% in payment time for connected firms, although this effect is not statistically significant.

One potential explanation for this increase lies in operational risk management. Politically connected firms may perceive themselves as more secure in terms of payment, allowing them to engage in different types of contracts that require longer execution timelines. Unfortunately, the available data lack the granularity and detailed information necessary to determine whether this mechanism explains the increased payment time.

Overall, the upbeat yet statistically insignificant effects suggest another channel of adjustment influenced by political connections. Future research could explore, with more detailed data on contract types, whether operational changes occur for firms connected to winning or losing politicians.

Table 7.1: Payment Time

Panel A. Baseline Sample		
	(I)	(II)
MoV Dummy	0.302* (0.172)	0.196 (0.172)
Bandwidth	0.05	0.05
Observation	1618	1618
Eff. Observation	263	263
Specification	Linear	Linear
Kernel	Triangular	Triangular
Election Control	NO	YES
Firm Controls	NO	YES
City Controls	NO	YES
Panel B. Turnover of Political Group		
	(I)	(II)
MoV Dummy	0.646* (0.335)	0.403 (0.306)
Bandwidth	0.05	0.05
Observation	456	456
Eff. Observation	75	75
Specification	Linear	Linear
Kernel	Triangular	Triangular
Election Control	NO	YES
Firm Controls	NO	YES
City Controls	NO	YES

Note: Cluster at municipality level, Robust Estimation Standard errors are in parentheses. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

8

Conclusion and future work

This article explored electoral processes as windows of opportunity for interactions between firms and politicians. Using a Regression Discontinuity Design (RD Design), the analysis found no significant evidence of favoritism toward firms directly connected to winning politicians compared to those connected to losing candidates. The Local Average Treatment Effect (LATE) also did not yield significant effects for different contracting formats, such as Low-Risk and High-Risk contracts.

Future research could explore dimensions beyond the probability of winning contracts, the number of contracts, and contract values. However, challenges related to the availability of more detailed datasets remain significant. Expanding the sample by including additional municipalities could increase the dataset size and enhance the analysis with more comprehensive information.

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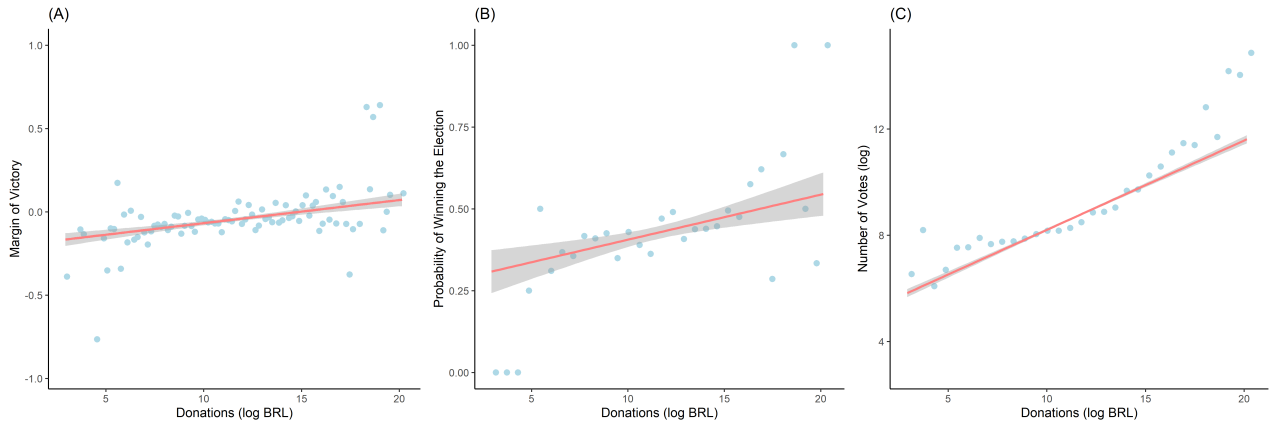
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A Electoral Data

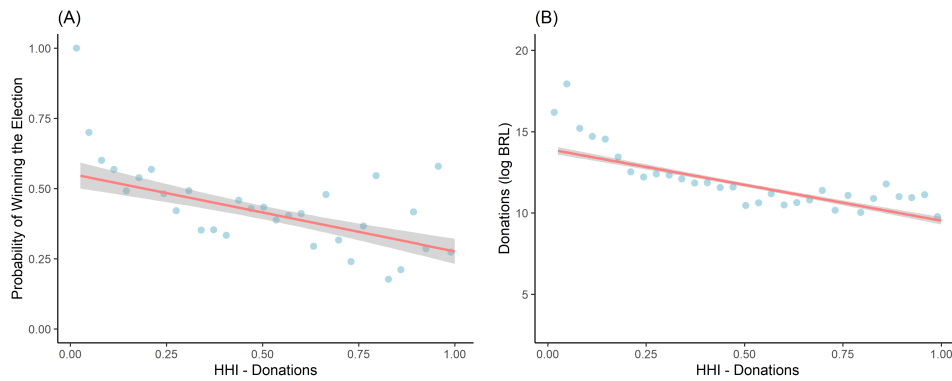
In this chapter of the Appendix, we present data related to electoral specifications based on TSE data, including information on electoral donations and election competitiveness.

Figure A.1: Correlation Between Campaign Donations and Electoral Outcomes



Note: (A) shows the relationship between campaign donations and electoral outcomes in terms of the Margin of Victory. When positive, the candidate is elected. When negative, the candidate is not elected. (B) Campaign donations and the probability of winning an election. The probability is given by the frequency of candidates elected within each donation characteristic. (C) Number of votes and donation amount.

Figure A.2: Concentration of Donations and Electoral and Revenue Outcomes



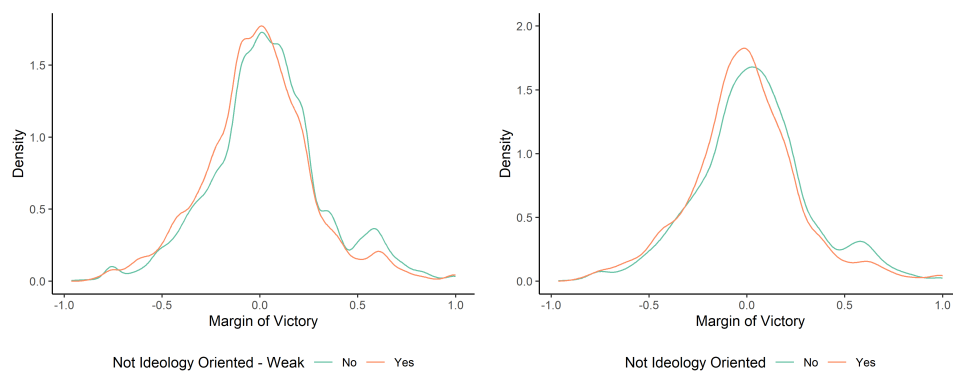
Note: The Herfindahl-Hirschman Index (HHI) is constructed as a measure of concentration of revenue sources through corporate donations. The higher the HHI, the more concentrated the candidate's donation sources. Panel (A) reports the correlation between HHI-Donations and the Probability of Winning the Election. Panel (B) shows the relationship between HHI and Donations.

Table A.1: Sources of Revenue and Their Relevance

Source	Revenue (R\$)	Ratio
Year 2008		
Description of donations related to commercialization	12.797.103,88	2%
Resources from other candidates/committees	204.883.174,34	35%
Resources from political parties	85.096.302,16	14%
Resources from unidentified origins	108.914,29	0%
Resources from individuals	81.928.850,98	14%
Resources from corporations	146.940.345,88	25%
Resources from own funds	55.747.417,35	9%
Income from financial applications	9.916,07	0%
Year 2012		
Sales of goods and/or events	2.917,25	0%
Resources from other candidates/committees	227.225.085,29	39%
Resources from political parties	162.612.425,09	27%
Resources from corporations	144.152.426,37	24%
Resources from own funds	75.352.165,31	12%

Note: Source: Tribunal Superior Eleitoral. All monetary values are in Brazilian Real (R\$).

Figure A.3: Concentration of Donations and Electoral and Revenue Outcomes



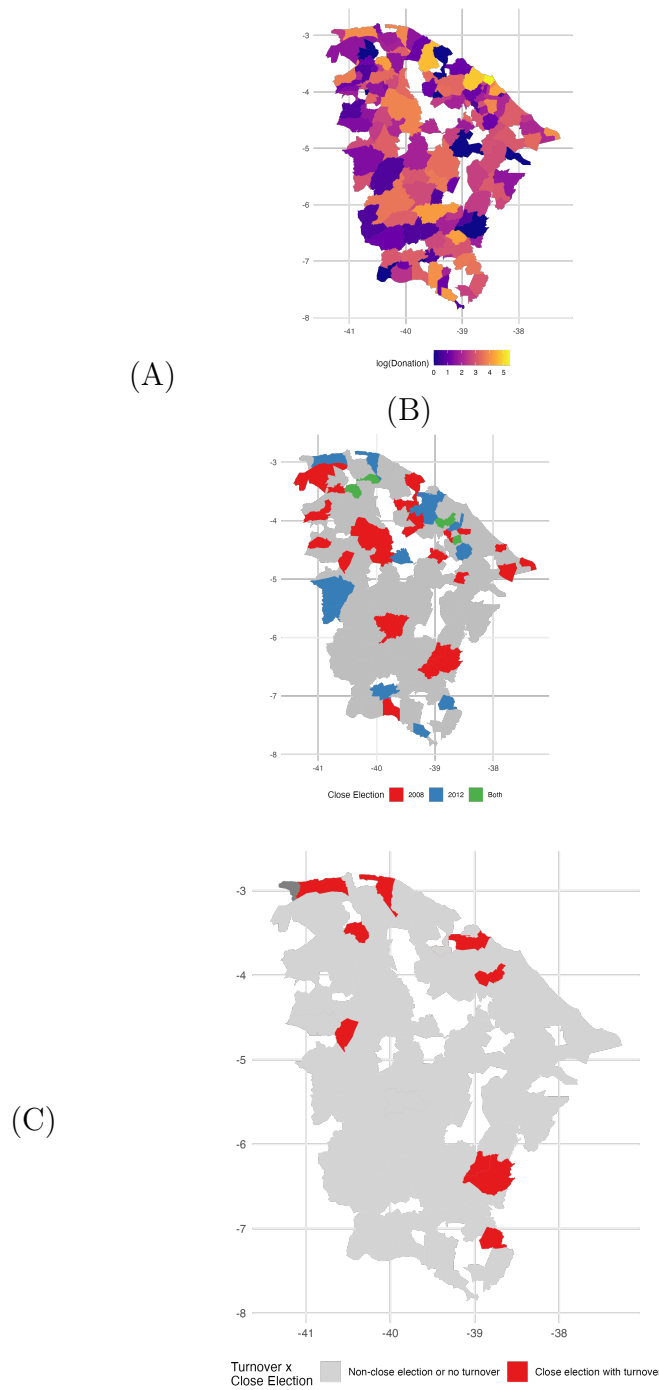
Note: Distribution of electoral outcomes for non-ideologically oriented donors. Non-ideologically oriented donors are defined as those who contribute to ideologically distinct parties within the same campaign. The party ideology definitions are based on (COLONNELLI et al., 2022). "Weak" refers to any ideological shift, while "Strong" refers exclusively to cases where the donor contributes collectively to both Left and Right parties.

Table A.2: Distribution of Party Members, and Left/Center/Right Party Categorization

Party Name	Acronym
Panel A: Left	
Workers' Party	PT
Democratic Labour Party	PDT
Brazilian Socialist Party	PSB
Communist Party of Brazil	PCdoB
Green Party	PV
National Mobilization Party	PMN
Socialism and Freedom Party	PSOL
Solidarity	SD
Republican Party of the Social Order	PROS
Unified Workers' Socialist Party	PSTU
Brazilian Communist Party	PCB
Sustainability Network	REDE
Workers' Cause Party	PCO
Free Homeland Party	PPL
Panel B: Center	
Brazilian Democratic Movement	(P)MDB
Brazilian Social Democracy Party	PSDB
Brazilian Labor Party	PTB
Forward	AVANTE
Social Democratic Party	PSD
Panel C: Right	
Progressives	PP
Democrats	DEM
Liberal Party	PL
Socialist People's Party	PPS
Christian Social Party	PSC
We Can	PODE
Brazilian Republican Party	PRB
Patriot	PATRI
Social Liberal Party	PSL
Christian Democracy	DC
Christian Labor Party	PTC
Brazilian Labor Renewal Party	PRTB
New Party	NOVO
Brazilian Women's Party	PMB
Progressive Republican Party	PRP
Humanist Solidarity Party	PHS

Notes: The table presents the list of all Brazilian parties over the 2002–2019 period, categorized by party ideology (Left/Center/Right).

Figure A.4: Ceará State



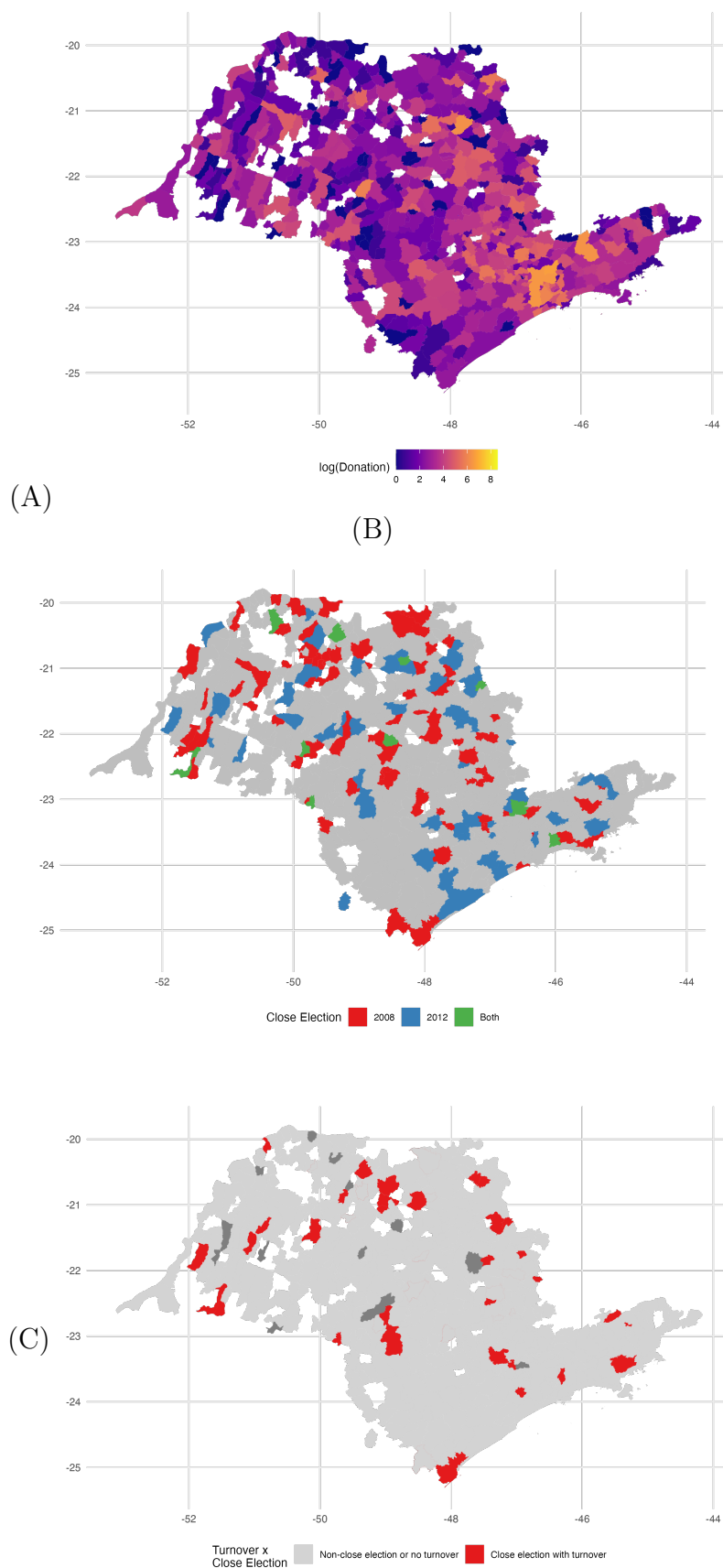
Note: The data above present the final version of the consolidation between electoral donations and close elections in the state of Ceará, located in the Northeast region of Brazil. The municipalities in white are those where there were no electoral donation processes via corporate entities within the scope used. Electoral donations are expressed in logarithmic form. Close election is equal to 1 when the Margin of Victory (MoV) between candidates is $\text{MoV} \leq |0.05|$. Zero corresponds to municipalities with electoral donations that are not in the close election scenario. Municipalities marked as NA are those where no legal campaign donations were recorded for the elections.

Table A.3: Sources of Revenue and Their Relevance for the Year 2016 - Candidates

Source	Revenue	Relevance
	Year 2016	
Description of donations related to commercialization	1,016.85	0%
Internet Donations	595,075.78	0%
Resources from other candidates/committees	660,258.38	0%
Resources from political parties	118,814,718.74	23%
Resources from unidentified origins	78,873.18	0%
Resources from individuals	220,370,473.91	43%
Resources from corporations	0.00	0%
Own resources	175,560,087.74	34%
Income from financial investments	5,339.37	0%

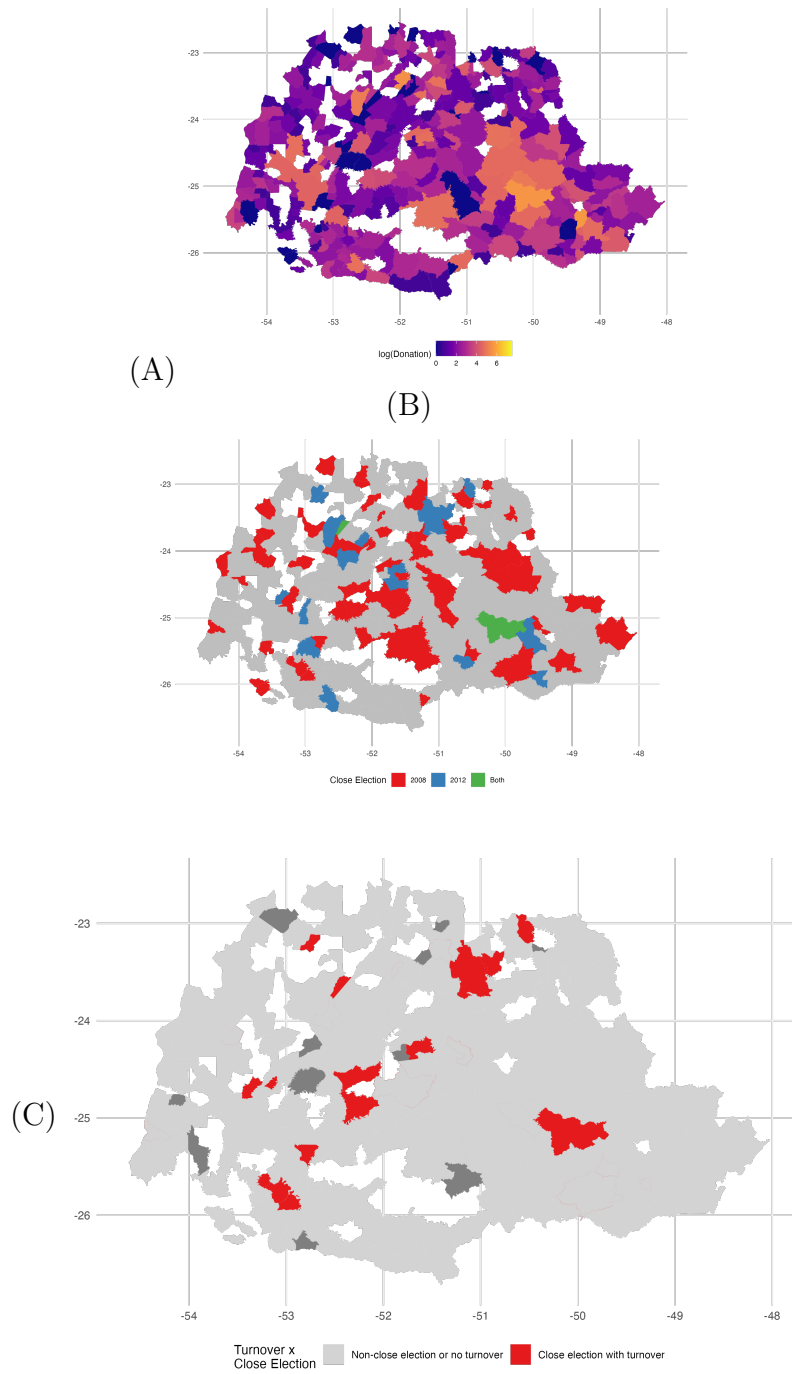
Note: Source: Tribunal Superior Eleitoral

Figure A.5: São Paulo



Note: The data above present the final version of the consolidation between electoral donations and close elections in the state of São Paulo, located in the Southeast region of Brazil. The municipalities in white are those where there were no electoral donation processes via corporate entities within the scope used. (A) The figure shows the distribution of donations across the specific territory. Electoral donations are expressed in logarithmic form. (B) It highlights the municipalities with competitive elections. Close election is equal to 1 when the Margin of Victory (MoV) between

Figure A.6: Paraná



Note: The data above present the final version of the consolidation between electoral donations and close elections in the state of Paraná, located in the southern region of Brazil. The white municipalities are those with no electoral donation processes via corporate entities within the scope used. (A) The figure shows the distribution of donations across the specific territory. Electoral donations are expressed in logarithmic form. (B) It highlights the municipalities with competitive elections. A close election is equal to 1 when the Margin of Victory (MoV) between candidates is $\text{MoV} \leq |0.05|$. Zero corresponds to municipalities with electoral donations not in the close election scenario. (C) It presents the municipalities with competitive elections and political group changes resulting from the electoral outcome. Municipalities marked as NA are those where no legal campaign donations were recorded for the elections.

B

Public Procurement

The procurement process for goods and services in Brazil's public sector is centralized under national regulations. During the period analyzed in this article, public procurement in Brazil was governed by Law No. 8,666 of June 21, 1993. This law set forth general guidelines on bidding and administrative contracts concerning works, services (including advertising), purchases, disposals, and leases within the scope of the Federal Government, the States, the Federal District, and the Municipalities. The entities subject to this legislation included direct administration bodies, special funds, autonomous entities, public foundations, public enterprises, mixed-economy companies, and other entities directly or indirectly controlled by the Union, States, Federal District, and Municipalities.

This law established a comprehensive regulatory framework to govern the state-private sector relationship through formalized bidding processes. Thus, the legislation standardizes procedures for public sector contracting and sets static monetary thresholds—without automatic adjustment mechanisms—for each type of procedure. The primary purpose of this regulation is to ensure equal opportunity among companies, prevent favoritism, and safeguard the public administration's ability to select contracts that offer the most advantageous terms.

However, the legislation does not entirely restrict discretion. The public sector requires varying degrees of discretion to interact with the private sector effectively. To address these needs, Law No. 8,666/1993 provided specific mechanisms for greater flexibility, such as direct contracting through waiver of bidding or sole-source procurement. Table B.1 summarizes the procedures available under Brazilian legislation until 2021.

Starting in 2021, a new procurement law, Law No. 14,133/2021, was introduced to update and streamline contracting procedures. This reform eliminated two types of bidding—invitation and price taking—raised the monetary limits for contracts exempt from bidding and facilitated greater collaboration between the public and private sectors in creating solutions for direct and competitive contracts. While the new law enhances flexibility regarding waivers, it also increases documentation and transparency requirements for processes where discretion is applied.

Table B.1: Public Bidding Modalities in Brazil

Bidding Modality	Definition	Value Limits	Application	Discretion
Competitive Bidding ("Concorrência")	Bidding modality among any interested parties who, in the initial phase of preliminary qualification, prove to have the minimum qualification requirements demanded in the notice.	Engineering works and services: Above R\$ 1,500,000.00 Purchases and services: Above R\$ 650,000.00	Large infrastructure projects, public service concessions.	Low
Price Quotation ("Tomada de Preços")	Bidding modality among duly registered interested parties or those who meet all the conditions required for registration up to the third day prior to the date of receipt of proposals.	Engineering works and services: Up to R\$ 1,500,000.00 Purchases and services: Up to R\$ 650,000.00	Medium-sized reforms, equipment acquisition.	Medium

Table B.1: (Continued)

Bidding Modality	Definition	Value Limits	Application	Discretion
Invitation	Bidding modality among at least three invited by the administrative unit, with other interested parties who meet the conditions of the invitation also able to participate.	Engineering works and services: Up to R\$ 150,000.00 Purchases and services: Up to R\$ 80,000.00	Small works, office supplies purchases.	Medium
Competition (“Concurso”)	Bidding modality aimed at choosing technical, scientific, or artistic work, through the institution of prizes or remuneration to the winners, according to criteria contained in a notice published in the official press at least 45 days in advance.	No value limit	Architectural project contests, cultural contests.	Medium

Table B.1: (Continued)

Bidding Modality	Definition	Value Limits	Application	Discretion
Auction	Bidding modality among any interested parties for the sale of movable property unserviceable for the administration or legally seized or pledged products, or for the alienation of real estate provided for in art. 19 of Law 8.666/93.	No value limit	Auction of official vehicles, sale of public properties.	Low
“Pregão”	Bidding modality intended for the acquisition of common goods and services, where the competition for supply is conducted in a public session through proposals and bids.	No value limit	Purchase of consumable materials, hiring of cleaning services.	Low

Table B.1: (Continued)

Bidding Modality	Definition	Value Limits	Application	Discretion
Waiver of Bidding	Situation where bidding is waived, according to the hypotheses provided for in Law 8.666/93.	Engineering works and services: Up to R\$ 15,000.00 Purchases and services: Up to R\$ 8,000.00	Emergency contracting after natural disasters, small purchases and services.	High
Non-requirement of Bidding (Inexigibilidade)	Situation where bidding is non-requirement, that is, there is no possibility of competition, according to the hypotheses provided for in Law 8.666/93.	No value limit	Hiring of renowned artists, acquisition of products from exclusive suppliers.	High

C

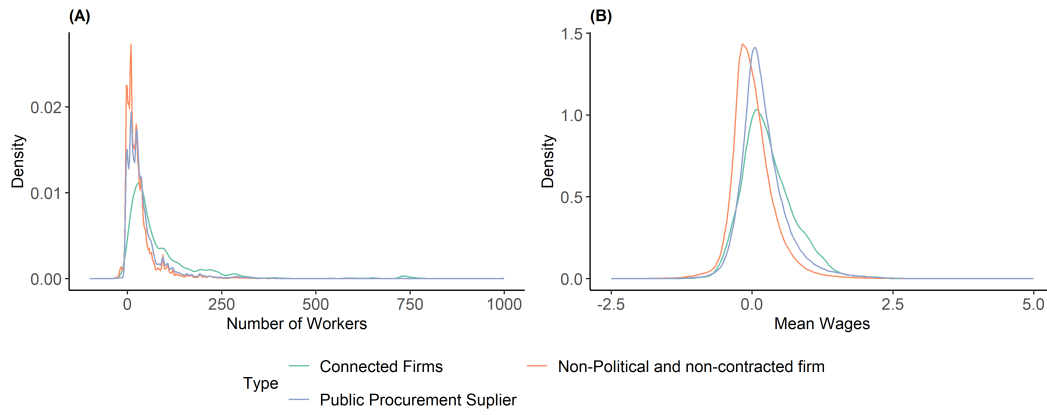
Firms Data

Table C.1: Descriptive Statistics by Winner and Loser

Variable	Loser (0)	Winner (1)
Observations (n)	2309	2537
Average Salary	3727.502 (3670.298)	3588.290 (4467.918)
Average Work	267.394 (1839.197)	201.816 (1340.457)
Average Hours	42.582 (3.523)	42.881 (3.192)
Average Age	6.768 (8.857)	6.319 (8.839)
Average Dismissals	0.330 (0.203)	0.238 (0.236)
Average Contracts	0.241 (0.253)	0.257 (0.259)
Average Education (Suj)	0.162 (0.295)	0.141 (0.243)
Average Education (MC)	0.463 (0.300)	0.470 (0.300)
Average Education (ME)	0.375 (0.328)	0.389 (0.323)

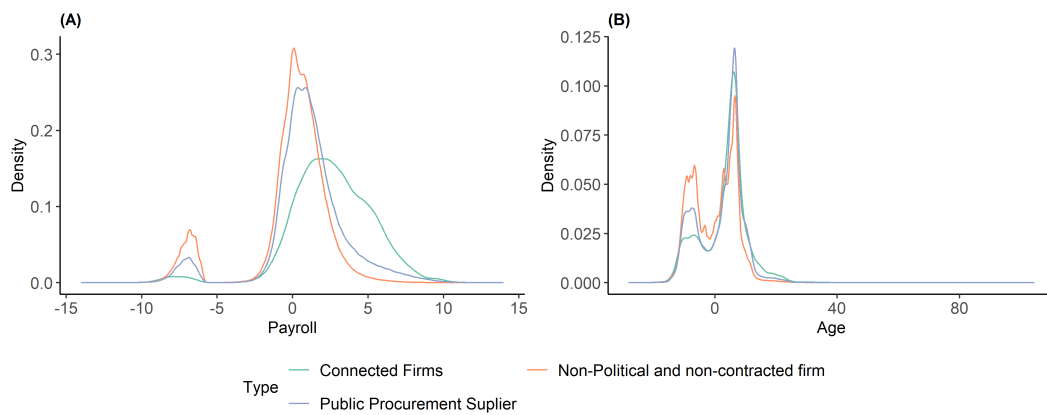
Source: RAIS, own elaboration

Figure C.1: Residual difference in Labor Market of Connected Firms, Public Procurement Supplier e Non-Political and Non-Supplier firms - Number of Workers and Mean Wages



Note: The residual is obtained from a linear regression that controls for election year, firm age, municipality, and economic activity. (A) shows the difference in Number of Workers; (B) in mean wage.

Figure C.2: Residual difference in Labor Market of Connected Firms, Public Procurement Supplier e Non-Political and Non-Supplier firms - Payroll and Age



Note: The residual is obtained from a linear regression that controls for election year, firm age, municipality, and economic activity. Panel (A) illustrates the differences in payroll, while Panel (B) focuses on age. For the final graph, firm age controls were excluded from the regression.

D

Regression

D.1

Regression on Descontinuity Design

D.1.1

Manipulation Test

D.1.2

Turnover Robustness

Table D.1: Robustness - Turnover - Test of Sensitivity of RDD estimation

Panel A. Kernel Uniform Function						
	Method	Coef	Std Error	P-value	95% C.I.	BW
Prob of Winning a Contract	Robust	0.113	(0.075)	0.130	[-0.033 , 0.260]	0.05
Number of Contracts	Robust	0.113	(0.075)	0.130	[-0.033 , 0.260]	0.05
Value of Contracts	Robust	1.261*	(0.733)	0.085	[-0.175 , 2.697]	0.05
Panel B. Second-Order local polynomial						
	Method	Coef	Std Error	P-value	95% C.I.	Optimal BW
Prob of Winning a Contract	Robust	-0.031	(0.139)	0.822	[-0.303 , 0.241]	0.05
Number of Contracts	Robust	0.028	(0.094)	0.767	[-0.157 , 0.213]	0.05
Value of Contracts	Robust	0.246	(0.911)	0.787	[-1.540 , 2.033]	0.05
Panel C. MSE-optimal Bandwidth Selector						
	Method	Coef	Std Error	P-value	95% C.I.	BW
Prob of Winning a Contract	Robust	-0.052	(0.048)	0.277	[-0.146 , 0.042]	0.154
Number of Contracts	Robust	-0.013	(0.038)	0.736	[-0.088 , 0.062]	0.130
Value of Contracts	Robust	0.261	(0.405)	0.519	[-0.532 , 1.054]	0.114
Panel D. CER-optimal bandwidth						
	Method	Coef	Std Error	P-value	95% C.I.	BW
Prob of Winning a Contract	Robust	-0.046	(0.053)	0.383	[-0.150 , 0.058]	0.108
Number of Contracts	Robust	-0.028	(0.041)	0.501	[-0.109 , 0.053]	0.095
Value of Contracts	Robust	0.248	(0.448)	0.580	[-0.631 , 1.127]	0.083
# Observations						
Controls	Election Controls	Firm Controls	City Controls			
	YES	YES	YES			

Note: Clustered at the municipality level, robust estimation. Standard errors are in parentheses. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

D.1.3**Social Cost - RD Design**

Table D.2: Sharp RD Estimates Adjusted for Covariates - Probability of Winning a Contract

Variable	Total Obs.	Eff. Obs. (Left Right)	BW (h)	Kernel	VCE Method	
Education	8713	802 757	0.050	Triangular	NN	
Healthy	8713	802 757	0.050	Triangular	NN	
Culture	8713	802 757	0.050	Triangular	NN	
Turnover						
Education	2416	183 302	0.050	Triangular	NN	
Healthy	2416	183 302	0.050	Triangular	NN	
Culture	2416	183 302	0.050	Triangular	NN	
Variable	Method	Coef.	Std. Err.	z	P> z	95% CI
Education	Conventional	-0.009	0.033	-0.272	0.786	[-0.074, 0.056]
	Bias-Corrected	-0.022	0.033	-0.670	0.503	[-0.087, 0.043]
	Robust	-0.022	0.046	-0.481	0.631	[-0.112, 0.068]
Health	Conventional	-0.026	0.026	-1.000	0.317	[-0.078, 0.025]
	Bias-Corrected	-0.028	0.026	-1.059	0.290	[-0.079, 0.024]
	Robust	-0.028	0.037	-0.744	0.457	[-0.101, 0.045]
Culture	Conventional	0.002	0.017	0.127	0.899	[-0.031, 0.035]
	Bias-Corrected	-0.011	0.017	-0.673	0.501	[-0.044, 0.022]
	Robust	-0.011	0.024	-0.467	0.640	[-0.059, 0.036]
Turnover						
Education	Conventional	0.004	0.034	0.110	0.912	[-0.064, 0.071]
	Bias-Corrected	0.032	0.034	0.935	0.350	[-0.035, 0.099]
	Robust	0.032	0.057	0.559	0.576	[-0.080, 0.145]
Health	Conventional	-0.058	0.019	-2.997	0.003	[-0.096, -0.020]
	Bias-Corrected	-0.088	0.019	-4.521	0.000	[-0.126, -0.050]
	Robust	-0.088	0.020	-4.307	0.000	[-0.128, -0.048]
Culture	Conventional	0.070	0.030	2.354	0.019	[0.012, 0.127]
	Bias-Corrected	0.074	0.030	2.513	0.012	[0.016, 0.132]
	Robust	0.074	0.055	1.349	0.177	[-0.034, 0.182]

Note: Note: The regressions above use the full version of the controls applied in previous estimations (IV) in Table 6.1. The full version includes the parameters that showed statistical significance in Table 5.1.

Table D.3: Sharp RD Estimates Adjusted for Covariates - Number of Contracts

Variable	Method	Coef.	Std. Err.	z	P> z	95% CI
Education	Conventional	-0.191	0.335	-0.569	0.569	[-0.848, 0.466]
	Bias-Corrected	-0.452	0.335	-1.349	0.177	[-1.109, 0.205]
	Robust	-0.452	0.468	-0.965	0.334	[-1.370, 0.466]
Health	Conventional	-0.090	0.095	-0.948	0.343	[-0.276, 0.096]
	Bias-Corrected	-0.085	0.095	-0.892	0.372	[-0.271, 0.101]
	Robust	-0.085	0.141	-0.600	0.549	[-0.362, 0.192]
Culture	Conventional	-0.030	0.040	-0.762	0.446	[-0.109, 0.048]
	Bias-Corrected	-0.079	0.040	-1.979	0.048	[-0.157, -0.001]
	Robust	-0.079	0.056	-1.411	0.158	[-0.189, 0.031]
Turnover						
Education	Conventional	-0.027	0.078	-0.346	0.729	[-0.179, 0.125]
	Bias-Corrected	-0.147	0.078	-1.898	0.058	[-0.300, 0.005]
	Robust	-0.147	0.121	-1.220	0.222	[-0.384, 0.089]
Health	Conventional	-0.185	0.040	-4.677	0.000	[-0.263, -0.108]
	Bias-Corrected	-0.332	0.040	-8.393	0.000	[-0.410, -0.255]
	Robust	-0.332	0.036	-9.194	0.000	[-0.403, -0.261]
Culture	Conventional	0.087	0.038	2.290	0.022	[0.013, 0.161]
	Bias-Corrected	0.069	0.038	1.818	0.069	[-0.005, 0.143]
	Robust	0.069	0.061	1.140	0.254	[-0.050, 0.188]

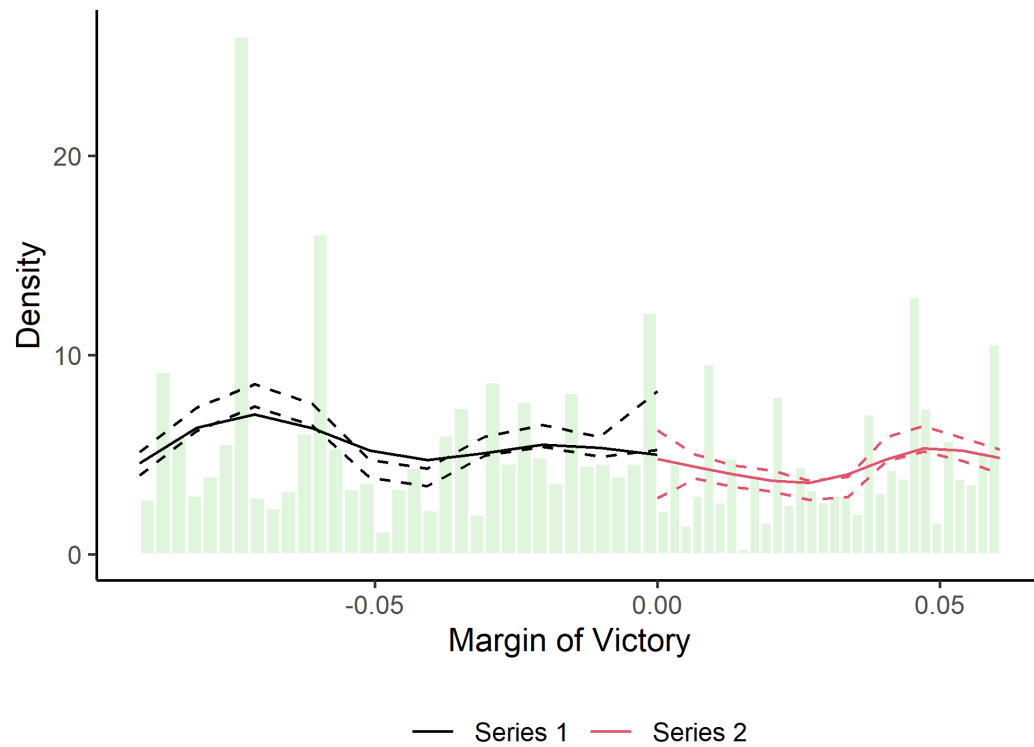
Note: Note: The regressions above use the full version of the controls applied in previous estimations (IV) in Table 6.1. The full version includes the parameters that showed statistical significance in Table 5.1.

Table D.4: Sharp RD Estimates Adjusted for Covariates - Total Value of Contracts

Variable	Method	Coef.	Std. Err.	z	P> z	95% CI
Education	Conventional	-0.194	0.333	-0.584	0.559	[-0.847, 0.458]
	Bias-Corrected	-0.456	0.333	-1.369	0.171	[-1.108, 0.197]
	Robust	-0.456	0.465	-0.979	0.327	[-1.368, 0.456]
Health	Conventional	-0.271	0.320	-0.846	0.398	[-0.899, 0.357]
	Bias-Corrected	-0.340	0.320	-1.061	0.289	[-0.968, 0.288]
	Robust	-0.340	0.473	-0.719	0.472	[-1.267, 0.587]
Culture	Conventional	0.000	0.145	0.001	0.999	[-0.284, 0.285]
	Bias-Corrected	-0.098	0.145	-0.677	0.498	[-0.383, 0.186]
	Robust	-0.098	0.206	-0.476	0.634	[-0.503, 0.306]
Turnover						
Education	Conventional	0.065	0.360	0.181	0.856	[-0.640, 0.770]
	Bias-Corrected	0.030	0.360	0.084	0.933	[-0.675, 0.735]
	Robust	0.030	0.566	0.054	0.957	[-1.079, 1.139]
Health	Conventional	-0.560	0.196	-2.856	0.004	[-0.945, -0.176]
	Bias-Corrected	-1.001	0.196	-5.103	0.000	[-1.386, -0.617]
	Robust	-1.001	0.199	-5.040	0.000	[-1.390, -0.612]
Culture	Conventional	0.560	0.228	2.459	0.014	[0.114, 1.006]
	Bias-Corrected	0.551	0.228	2.420	0.016	[0.105, 0.997]
	Robust	0.551	0.410	1.344	0.179	[-0.252, 1.354]

Note: Note: The regressions above use the full version of the controls applied in previous estimations (IV) in Table 6.1. The full version includes the parameters that showed statistical significance in Table 5.1.

Figure D.1: Manipulation Test



Note: The manipulation test evaluates potential discontinuities in the running variable's density around the cutoff, as proposed by Cattaneo, Jansson, and Ma (2020). The test employs local polynomial density estimators with a triangular kernel, an unrestricted model, and a jackknife variance-covariance estimation (VCE) method. The bandwidth is optimally selected based on estimation procedures. Graphical procedures with valid confidence bands are implemented following the methodological advancements in Cattaneo, Jansson, and Ma (2022, 2023). The results indicate no evidence of manipulation at the cutoff, with a p-value of 0.9739, suggesting that the running variable's distribution is smooth around the threshold.