

Information About Corruption and Politicians' Proposals *

Guillermo Lezama[†]

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Abstract

Corruption revelations can significantly disrupt electoral campaigns by compelling politicians to address newly exposed policy issues, navigate reputation shocks, and adjust their ideological positioning to respond effectively to voter concerns. This study investigates how exposing corruption affects politicians' policy agendas and rhetorical approaches. Utilizing natural language processing on 13,344 manifestos from Brazil's 2012 mayoral elections—and leveraging the random assignment of municipalities to public fund audits—I analyze changes in political discourse. I find that in municipalities with a high share of irregularities in specific policy areas, incumbents reduced their discussion of those areas, while opposition candidates increased their focus on them. Additionally, corruption revelations influenced the use of populist and extremist rhetoric, with opposition candidates in low-corruption municipalities moderating their language and incumbents in high-corruption municipalities adopting a more populist tone in their rhetoric, though this finding was not robust across all statistical tests. These findings highlight how transparency shapes political communication during elections, affecting politicians' strategic adaptations in response to corruption revelations.

JEL codes: D72, P16, H7

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[†]Department of Economics, University of Pittsburgh. guillermo.lezama@pitt.edu

1 Introduction

In electoral campaigns, politicians have the opportunity not only to address pressing issues but also to shape voter perceptions and priorities. By presenting information and policy proposals, candidates aim to influence the electorate's views on what matters most for the future of their communities. However, these periods can also witness the propagation of misinformation and the rise of populist rhetoric, raising concerns about the integrity of the electoral process (e.g., Batista Pereira, Bueno, Nunes, & Pavão, 2022). Politicians strategically craft their messages to both align with voter concerns and to persuade voters to adopt new perspectives, all in an effort to maximize support and win elections. Understanding how politicians position themselves is crucial, as their rhetoric has real-life consequences for public opinion and societal behaviors (e.g., Ajzenman, Cavalcanti, & Da Mata, 2023; Hobbs & Lajevardi, 2019). This influences not only electoral outcomes but also subsequent policy directions and governance.

One significant factor that can alter the dynamics of electoral campaigns is the revelation of corruption scandals. Such disclosures can erode public trust in government institutions and incumbents, prompting voters to re-evaluate their support for certain candidates or parties. This erosion of trust may amplify the effects of misinformation and facilitate the adoption of populist narratives (Berman, 2021). In this context, politicians may adjust their campaign strategies to address concerns about integrity and accountability.

While it is well-documented that corruption disclosures can lead to the removal of corrupt officials and reduce future malfeasance (e.g., Avis, Ferraz, & Finan, 2018; Ferraz & Finan, 2008), less is known about how politicians themselves respond to such revelations. Specifically, it remains unclear whether and how politicians adjust their rhetoric and policy agendas in the wake of corruption scandals. Do incumbents and challengers respond differently to these exogenous shifts in reputation? For incumbents, whose reputations may be directly affected, they might focus on issues where they are perceived as relatively stronger to mitigate negative impacts. Conversely, challengers might capitalize on the incumbents' weakened standing by emphasizing the implicated issues to align with public sentiment. Understanding these strategic adjustments is crucial for unpacking the dynamics of electoral accountability and political communication.

Moreover, such revelations could provide fertile ground for the rise of populist and extremist narratives. Politicians might adjust their messaging not only to regain public trust but also to appeal to a disillusioned electorate by emphasizing anti-corruption measures or adopting populist rhetoric, which can have significant real-world implications for democratic stability and social cohesion (Berman, 2021; Clayton et al., 2021; Gaspar, Giommoni, Morelli, & Nicolò, 2021; Mudde & Rovira Kaltwasser, 2018). This raises further questions: Do corruption scandals encourage politicians to shift their ideological positioning? Are they more likely to employ populist strategies to gain political capital in the face of public discontent?

In summary, this paper contributes to this debate by addressing two key questions: first, do politicians adjust their agendas by focusing on the policy areas implicated in corruption scandals? Second, how do these revelations shape the use of populism and extremism in their rhetoric? I further examine the heterogeneity of these responses by distinguishing between incumbents and challengers and analyzing how their strategies vary depending on the level of corruption in their municipality.

To explore these questions, this paper draws on existing theories about the role of information and reputational shocks in political discourse. Audits provide both new information and reputational signals to candidates, influencing their strategic positioning and issue selection during campaigns. This aligns with the broader literature on how information shocks drive electoral accountability and policy responsiveness (e.g., Abou-Chadi, Green-Pedersen, & Mortensen, 2020; Williams, Seki, & Whitten, 2016).¹

There are at least three main channels through which audits may shape political communication. First, audits reveal specific irregularities, prompting both incumbents and challengers to adapt their agendas by focusing on areas where issues have been identified. Second, audits can lead to reputational shocks that influence how candidates position themselves on the ideological spectrum. For instance, incumbents facing negative reputational impacts may emphasize policy successes to regain trust (e.g., Groseclose & Milyo, 2005; Serra, 2010), while challengers might shift their positioning to attract disillusioned voters. Lastly, heightened transparency on corruption can encourage the adoption of populist rhetoric, as candidates aim to capitalize on

¹A detailed explanation of the theoretical channels through which these effects operate is provided in Appendix B, outlining how audits may affect issue selection, partisanship, and populist rhetoric.

public dissatisfaction with governance (e.g., Berman, 2021; Gennaro, Lecce, & Morelli, 2024).

This paper addresses these questions by using data from a Brazilian anti-corruption audit program and employing various text analysis techniques—ranging from simple dictionaries to supervised machine learning methods—on mayoral candidates’ proposals. The program provides a natural experiment, enabling an assessment of how candidates in municipalities with exposed corruption adjust their proposals compared to those in non-audited municipalities. The aim is to understand the strategic adaptations in political communication in response to corruption disclosures, shedding light on how such revelations shape electoral discourse, particularly regarding issue emphasis, ideological extremism, and populism.

Brazilian anti-corruption audit program aimed at increasing government transparency and reducing corruption has yielded significant results. Municipalities were randomly selected for audits through a lottery system, resulting in a steady flow of information about local governance that was made available to politicians, incumbents, candidates, and the electorate. These revelations often triggered reputational shocks, especially when high levels of corruption were uncovered, though even minor irregularities could still lead to adverse effects. The identification strategy in this study builds on Ferraz and Finan (2008), using the random variation in audit timing to compare municipalities with similar corruption levels but different levels of awareness about audit reports before the 2012 election. This variation allows for an analysis of how the timing of audit disclosures influenced political campaigns. Additionally, the requirement for mayoral candidates in Brazil to submit an electoral manifesto before the election provides a rich dataset for understanding how audit information shaped politicians’ priorities and communication strategies. Manifestos have been used in the literature to analyze party platforms (Cagé, Le Pennec, & Mougin, 2024; Le Pennec, 2024). This paper explores the extent to which these manifestos were influenced by the audits disclosed before the election.²

I find that unveiling corruption cases influences political manifestos’ content and ideological framework. When candidates are informed about an audit report before an election, they are more likely to incorporate terms from that report into their manifestos compared to those who

²In Brazil, electoral manifestos—known as “planos de governo”—are legally required documents that candidates must submit when registering their candidacy. These manifestos detail the candidates’ proposed policies and governance plans, underscoring their role in the electoral process. They are publicly accessible and often receive attention from the media, civil society organizations, and voters who scrutinize the candidates’ commitments.

learn of it afterward. However, incumbents tend to avoid or reduce discussion on areas where the audit report indicates high corruption, while challengers tend to emphasize these very areas. This pattern indicates that while audit reports guide candidates' proposals, candidates also strategically select topics they believe will strengthen their position, aligning with existing theoretical literature on strategic campaigning (Riker, 1996). Importantly, these findings are robust even after accounting for multiple hypothesis testing, particularly for challengers' behavior in response to audits. Additionally, the average effects of audits (without considering unveiled corruption) show that challengers use audit disclosures to amplify discussions on specific policy areas, while incumbents remain more cautious, likely balancing informational gains with reputational risks.

Further analysis of audit reports indicates that in municipalities with higher levels of corruption, incumbents tend to adopt a more populist stance. This shift toward populism aligns with theories on strategic rhetoric, where incumbents may use populist messaging to deflect attention from governance failures. This effect weakens after correcting for multiple hypothesis testing. In this paper, populism is understood as a discourse based on three core elements: (1) "the people" as a unified and virtuous group, (2) the elite as a corrupt and antagonistic entity, and (3) the antagonism between the people and the elite, accompanied by a call to return power to the people through direct democratic mechanisms (Gennaro et al., 2024; Mudde & Kaltwasser, 2013).³ In contrast, in lower-corruption municipalities, the audit report—acting as a positive reputational boost for the incumbent—leads challengers to adopt a more moderate and less populist stance. This moderation in challengers' rhetoric remains robust even after multiple testing adjustments, indicating a more stable strategic response to audits.

While some "grease-the-wheels" theories propose that corruption may enhance incumbents' reputations by signaling efficient governance (e.g., Manzetti & Wilson, 2007), existing research shows the opposite. For instance, Ferraz and Finan (2008) finds that voters penalize mayors when corruption is uncovered. Consistent with this, this paper's findings weakly suggest that incumbents strategically avoid discussing corruption-related topics following such revelations,

³To identify whether these elements are present in political manifestos I use a dictionary with certain words associated to these elements. This dictionary can be found in subsection F. For example for the first element, I use "povo" ("people" in English), for the second, "corrupção" ("corruption" in English) and for the third one "arrogante" or "traição" ("arrogant" or "betrayal").

while challengers amplify these issues to critique incumbents. This underscores how the exposure of corruption reshapes electoral dynamics, compelling candidates to adapt their messaging to either mitigate reputational damage or leverage voter dissatisfaction.

Revealing corruption has a clear impact on electoral accountability and the priorities that politicians emphasize in their communication. However, politicians remain strategic in their responses, focusing on topics they believe will serve their electoral interests. The study also highlights the unintended consequences of transparency, as incumbents in high-corruption municipalities may shift toward more populist rhetoric to manage reputational risks. In sum, audits concerning public-funds' use significantly shape the communication strategies of politicians, influencing both the topics they address and their ideological positioning.

This paper contributes to several strands of literature. First, it adds to studies that demonstrate how politicians react to the disclosure of information about their performance, particularly in terms of electoral choices and effort (e.g., Cavalcanti, Daniele, & Galletta, 2018; Poblete-Cazenave, 2021; Snyder Jr & Strömberg, 2010). This paper explores how reputation shocks from new information affect candidates' agendas and their political positioning.

Second, the study contributes to the growing body of research on the rise of populism and extremism. To the best of my knowledge, the effect of changes in the informational environment on populism has not been previously studied. This research shows how the supply of populism varies between high-corruption and low-corruption settings. Berman (2021) synthesizes part of the supply-side explanations of populism by highlighting how institutional decay, including corruption, contributes to the rise of populism. According to this body of literature, political institutions in advanced industrial nations have become less responsive and effective over time, creating dissatisfaction and eroding public trust. Corruption and distortions in democratic processes, such as the increasing role of money in politics or the disconnect between voter preferences and policy outcomes, exacerbate this institutional failure. These conditions provide fertile ground for populist leaders, who capitalize on public frustration by presenting themselves as alternatives to a corrupt and inefficient establishment. This paper extends this literature by testing theories that suggest populism is a deliberate choice made by politicians and parties to attract votes in response to exogenous shocks (e.g., Gennaro et al., 2024). In particular, my work shows that the revealing of corruption (a sign of institutional decay) affects politicians'

adoption of populist rhetoric.

Regarding extremism, this paper contributes to the theoretical literature on how politicians adjust their policy positions and rhetoric in response to reputational shocks (e.g. Bernhardt, Buisseret, & Hidir, 2020; Buisseret & Van Weelden, 2022; Dragu & Fan, 2016; Serra, 2010). While Gaspar et al. (2021) focuses on how corruption shapes voter preferences, particularly driving the selection of more extreme opposition representatives who are perceived as less likely to be corrupt, my paper addresses how candidates, in turn, adjust their campaign rhetoric in response to audit disclosures. By focusing on the strategic choices politicians make in crafting their manifestos—rather than voter behavior—this study provides complementary insights into how electoral dynamics respond to corruption revelations.

Third, this paper expands on the existing literature that employs text analysis on political manifestos to analyze politicians' rhetoric and strategies (e.g. Cagé et al., 2024; Catalinac, 2018; Crabtree, Golder, Gschwend, & Indriason, 2020; Le Pennec, 2024; Venturelli, 2024). It introduces a new factor impacting communication strategies—information about government audits—and shows that audits influence the topics discussed in subsequent elections, particularly in cases of negative reputation shocks.

Finally, this paper builds on prior research examining the effects of disclosing government information, particularly audits. Previous studies have shown that audits impact corruption, economic activity, and public hiring practices Avis et al. (2018); Colonnelli and Prem (2022); Ferraz and Finan (2008, 2011); Gonzales (2021); Lauletta, Rossi, and Ruzzier (2022). For example, Amorim (2022) found that transfers to the health sector from the federal government decreased in municipalities with a high number of irregularities post-audit. My paper extends this body of work by examining the effects of audits on politicians' political positioning and agendas, focusing specifically on the political leaders' response to audit reports in their electoral campaigns.

My paper offers several insights into the study of corruption, political behavior, and elections. Politicians respond to the revelation of irregularities, especially in highly corrupt environments. Both incumbents and challengers react to these audits after the informational shock, but their strategies differ. Incumbents tend to adopt more populist rhetoric, while challengers are more likely to focus on policy issues related to the audits. Revealing corruption informa-

tion close to election campaigns matters for political strategies and may result in unintended consequences, such as more polarized platforms.

In what follows, I introduce the institutional context and data (Section 2). Next, I present the empirical strategy (Section 3), followed by the results on the impact of audits on politicians' agendas (Section 4) and politicians' rhetoric (Section 5). Finally, a discussion and conclusion section follows the results (Section 6).

2 Background and Data

2.1 Brazilian Anti-Corruption Audit Program

In 2003, the Brazilian Federal Government launched an anti-corruption audit program, overseen by the State Comptroller (Controladoria Geral da União; CGU), to monitor the use of public funds in municipalities. Municipalities were selected for audits through a lottery system, ensuring random assignment. Auditors from the CGU conducted inspections over 1-2 weeks, collecting documentation on public spending for the previous 3-4 years. The resulting reports were forwarded to city councils, prosecutors, and published on the CGU's website, making the findings publicly available.

All municipalities with populations under 500,000 were eligible for participation in the audit program, and selection was determined by a public lottery system. Over 40 editions of the program, 1,955 municipalities were subjected to 2,180 audits. The probability of a municipality being audited varied by state and the period of the audit (Avis et al., 2018). Both the frequency of the lotteries and the number of municipalities audited per lottery evolved over time. Between lotteries 28 and 33, smaller municipalities underwent comprehensive audits across all sectors, while larger ones were audited in specific sectors only (see Table A.I for a breakdown of audited sectors by municipality size). After lottery 34, all municipalities were audited in predetermined sectors based on the lottery's focus at the time.⁴

The data from Brazil's random audit program has been widely used by researchers to explore its impact on corruption and various political and economic outcomes. Studies have shown that these audits significantly influenced election results (Ferraz & Finan, 2008) and contributed to

⁴For a detailed description of the audit program, see Avis et al. (2018) and Ferraz and Finan (2008).

a reduction in corruption over time (Avis et al., 2018). Other research, such as that by Ferraz and Finan (2011), Brollo and Troiano (2016), and Colonnelli and Prem (2022), has further examined the effects of these audits on governance and voters' political behavior.

By leveraging CGU audits, this paper assesses how the disclosure of corruption in the use of public funds impacts candidates' proposals. I focus on municipalities audited before the 2012 election (lotteries 28 to 35), with municipalities audited after the election (lotteries 36 to 38) serving as a control group. Figure A.I shows a map of the municipalities that were audited in each period.

To measure the effect of these audits, I rely on CGU data that indicates the level of corruption identified in each audit. Following the approach of Avis et al. (2018), I categorize acts of moderate and severe corruption together as corruption cases. Additionally, I have data on the number of irregularities detected in each sector (Table 5), allowing me to analyze the impact of audits on election outcomes, taking into account the number of corruption cases.

2.2 2012 Municipal Elections and Municipality Characteristics

Brazil consists of 5,568 municipalities, each responsible for providing essential services such as water, sanitation, health, and education. Data on municipal characteristics (such as income, population, etc.) were obtained from the 2011 Pesquisa de Informações Básicas Municipais (MUNIC) survey, conducted by the Brazilian Institute of Geography and Statistics (IBGE). Mayors in these municipalities are elected every four years, with elections typically held in October alongside elections for vice-mayors and city councilors. In cities with populations exceeding 200,000, a second-round runoff is held if no candidate secures more than 50% of the valid votes in the first round.

Table 1: Descriptives: Candidates' Characteristics

| | Rounds 28 - 35 (2009-2012) | | Rounds 36 - 40 (2012-2015) | | Other | |
|-------------------------------|----------------------------|-------|----------------------------|-------|-------|-------|
| | Mean | SD | Mean | SD | Mean | SD |
| Age | 48.70 | 10.53 | 48.13 | 10.35 | 48.58 | 13.66 |
| % College Studies | 0.55 | 0.50 | 0.58 | 0.49 | 0.56 | 0.50 |
| % Women | 0.14 | 0.35 | 0.13 | 0.34 | 0.13 | 0.34 |
| % Same party as the President | 0.10 | 0.30 | 0.11 | 0.32 | 0.12 | 0.32 |
| % Same party as the Governor | 0.15 | 0.35 | 0.13 | 0.33 | 0.15 | 0.36 |
| Running for re-election | 0.18 | 0.38 | 0.19 | 0.39 | 0.18 | 0.38 |
| Number of Candidates | 3.38 | 1.50 | 3.39 | 1.45 | 3.29 | 1.46 |
| Observations | 1129 | | 423 | | 11548 | |

Notes: This table shows means and standard deviations for candidates' characteristics comparing those from audited and non-audited municipalities. Only candidates for which a manifesto was retrieved are considered. Data from TSE.

The data for the 2012 municipal elections in Brazil was obtained from the Superior Electoral Court (TSE), which also provided information on candidates' characteristics. The data shows that candidates in both audited and non-audited municipalities had similar profiles. Table 1 presents the means of candidates' characteristics, which are generally comparable between audited and non-audited municipalities.

In these elections, it is common for more than two parties to compete, with national parties frequently forming coalitions to support mayoral candidates. Thirty-one parties fielded candidates in the 2012 municipal elections, with three parties representing more than 10% of the total: the Brazilian Social-Democratic Party (PSDB, center according to the classification described in subsection I) with 15%, the Workers' Party (PT, left) with 12.3%, and the Brazilian Democratic Movement (MDB, center) with 10.8%. Notably, mayors in Brazil are limited to one consecutive re-election term.

Table A.VI and Table 2 present the means and standard deviations for various municipal characteristics. Given the empirical design, I expect to see a balance between municipalities audited before the election and the control group (municipalities not audited between 2009 and 2012). The results suggest that there are no significant differences in municipal characteristics between those audited from 2009 to 2012 and those not audited during that period (Table A.VI). Similarly, there are no significant differences between municipalities audited from 2009 to 2012 and those audited after the 2012 election but before the 39th round of lotteries (Table 2). Table A.VII and Table A.VIII further compare municipalities with low and high levels

of corruption cases, respectively. While some variables show minor imbalances, F-tests indicate that these differences are not jointly significant for either high-corruption municipalities (F-test = 0.92, p-value = .53) or low-corruption municipalities (F-test = 1.45, p-value = .17).

Table 2: Mean Comparisons between Municipalities Audited Before and After Elections

| | Control | Treatment | Difference |
|--|------------------------|----------------------|----------------------|
| GDP pc | 11700.37 [14514.56] | 10805.9 [9571.88] | -483.2 [1320.197] |
| Share Illiterate (%) | 84.28 [8.84] | 83.52 [9.33] | -0.16 [0.546] |
| Share Urban | 0.64 [0.22] | 0.63 [0.21] | 0 [0.014] |
| Share Secondary Education and above | 0.22 [0.08] | 0.21 [0.08] | 0 [0.005] |
| Share of Bureaucrats with Superior Education | 0.31 [0.11] | 0.3 [0.11] | -0.01 [0.009] |
| HDI | 0.65 [0.07] | 0.64 [0.07] | 0 [0.004] |
| AM radio | 0.2 [0.4] | 0.2 [0.4] | 0 [0.041] |
| Gini | 0.5 [0.06] | 0.51 [0.06] | 0 [0.004] |
| Population (logs) | 9.41 [1.11] | 9.47 [1.1] | 0.07 [0.053] |
| Audited Previously | 0.24 [0.43] | 0.26 [0.44] | 0.03 [0.043] |
| Observations | 165 | 478 | |

Notes: Estimates are means and standard deviations (in brackets) of various municipal characteristics by places that have been audited in round 28 to 35 (2009-2012) (Treatment) and places that have been audited in rounds 36 to 38 (control). The difference and corresponding standard error (in brackets) are computed from a regression that controls for state.

2.3 Party Manifestos

Since 2009, electoral law has required all mayoral, gubernatorial, and presidential candidates to submit their manifestos before the election. Manifestos serve as an essential tool for understanding candidates' political rhetoric and priorities. As these documents represent the official communication of policy proposals, they offer valuable insights into how candidates adapt their messaging in response to external factors, such as audit reports. The manifestos from the 2012, 2016, and 2020 municipal elections can be found on the Electoral Authority (Tribunal Superior Eleitoral—TSE) website.

To construct the dataset for this study, I collected manifesto documents in PDF format from the TSE website.. For the 2012 election, 16,173 documents were uploaded, of which 13,724

were retrieved. After preprocessing, 13,344 texts from 5,140 municipalities were available. To improve the dataset for text analysis, I standardized the text by removing non-informative content, such as candidate names and formatting errors, to ensure cleaner and more consistent data. More details about the preprocessing steps and exclusion criteria are provided in the Appendix C. Each manifesto was linked to the candidate data using a unique identifier obtained during data scraping. The average number of words per manifesto was 2,150 (Table 3).

2.3.1 Overlap Between Audit Reports and Manifestos

To assess the extent to which the audit report’s vocabulary overlaps with each party’s manifesto, I perform an analysis of text similarities between the two. This measure captures the degree to which candidates incorporate the language of the audit findings into their electoral campaigns. For each manifesto, I generate a list of words used (excluding stop words), and the same is done for each audit report. The overlap is then calculated as the proportion of words in the audit report that also appear in the candidate’s manifesto.

For each candidate j , in a municipality with an audit report d , the overlap is computed as:

$$\frac{\sum_{w \in d} \mathbb{1}[w \in d \cap j]}{m_d} \quad (1)$$

where w represents each word in the audit report of municipality d , and m_d is the total number of words in the audit report of municipality d . The numerator reflects the number of words shared between the audit report and the manifesto.

This measure provides an initial quantitative approach to evaluate the extent to which politicians incorporate the findings of audit reports into their campaign proposals. It offers an objective and transparent way to assess content utilization, helping to analyze how closely aligned the candidates’ platforms are with the outcomes of the audit.

2.3.2 Proposals’ Topics

The manifestos were organized into topics using the headings present in each document. The entire corpus consisted of 3,445,957 lines, with each line containing an average of 7.6 words. To identify the topic discussed in each line, I used a Multinomial Naive Bayes classifier to estimate

the probability that a line belongs to one of ten different topics. These topics included six policy-specific areas (Bureaucracy, Social, Health, Urban, Economics, and Crime), two general categories (Titles and Introduction/Other), and one residual category (Unrecognizable Words). Examples of headings for each topic can be found in Table A.II.

I validated the classification by manually categorizing a random sample of 100 manifestos (0.75% of the total) into topics. The model was trained and fine-tuned using these manually classified documents following the preprocessing steps outlined in subsection C. Once trained, the model was applied to the entire corpus.

Each line in the manifesto was treated as a vector of word frequencies, with a frequency of 0 if a word did not appear in the line. The Multinomial Naive Bayes classifier was used to calculate the probability $P(w|C_k)$ for each word w and topic C_k .⁵ This machine learning algorithm, commonly used for text classification, applies Bayes' theorem under the assumption of feature independence. Each line L is treated as a "bag of words," where each word is a feature, and the algorithm calculates the likelihood of L belonging to topic C_k based on the presence of certain words. The likelihood is calculated as follows:

$$P(L|C_k) = \frac{\text{prior} \times \text{likelihood}}{\text{evidence}} = \frac{(\sum_{i=1}^n w_i)! \times \prod_{i=1}^n p(w_i|C_k)}{\prod_{i=1}^n w_i!} \quad (2)$$

An 80-20 train-test split was used for model validation. I calculated two types of predictions: a soft prediction and a hard prediction. The soft prediction calculates the probability of each line being assigned to each topic. After calculating $P(L|C_K)$ for each line L , I computed π_K for each document d by multiplying these probabilities by the number of words in the line and dividing it by the total number of words in the document. The variable d_k represents the predicted share of the document that discusses topic k :

$$d_k = \sum_{L \in d} P(L|C_K) \times \frac{|w \in L|}{|w \in d|} \quad (3)$$

where $| \cdot |$ indicates the cardinality of the set.

For the hard prediction, I assign each line to the topic with the highest probability and

⁵Other models were tested. In subsection D I show the different approaches that were explored and a performance analysis for each of these alternatives. The other models produced lower accuracy rates and higher log-loss values compared to the Multinomial Naive Bayes classifier.

create a binary variable for each topic to indicate whether the line belonged to topic k . I then then multiplied this binary variable by the share of words in document d corresponding to that line:

$$\omega_k = \sum_{L \in d} \mathbb{1}[k \in \arg \max_k P(L|C_K)] \times \frac{|w \in L|}{|w \in d|} \quad (4)$$

This classification strategy scored 62% in accuracy. For comparison, random assignment of topics (using the sample distribution) would have yielded an accuracy rate of 16.9%. Table A.IV shows the distribution of the share of the document dedicated to each topic. For validation, in subsubsection VIII, I show the most frequently used words within each of the categories across the 3,225,407 sentences to which the algorithm was applied.

2.3.3 Partisanship and Extremeness

To assess the degree of extremeness in each candidate’s manifesto, I follow Le Pennec (2024)’s strategy, which builds on the *Wordscores* approach (Laver, Benoit, & Garry, 2003). This method calculates a left-right score for each manifesto by classifying parties as left-wing, right-wing, or center (see subsubsection I for classification details). The score indicates the manifesto’s position on the political spectrum, with values ranging from 1 (representing an average right-wing document) to -1 (representing an average left-wing document). Extremeness is defined as the absolute value of this score, reflecting the distance from the center. For further details on the computation, see subsection E.

For partisanship, I calculate how closely a manifesto aligns with other manifestos from the same party, based on word usage frequencies. Instead of using broad ideological categories, I compute a score specific to each party. The full procedure for calculating partisanship is described in subsection E.

2.3.4 Populism

To measure the share of populist content in each document, I applied a dictionary-based approach following Gennaro et al. (2024)⁶ and Mendes (2021). Populism, in this context, refers to discourse that frames the people as a homogeneous and pure entity (e.g., “people”), juxtaposed

⁶Gennaro et al. (2024) discuss how their dictionary effectively captures the people-vs-elite rhetoric, a core feature of populism and the most commonly used dimension in empirical studies to measure populism.

against the elite as a corrupt and homogeneous group (e.g., “establishment”, “corruption”). It emphasizes the antagonistic relationship between these two groups (e.g., “arrogant”, “betray”), and stresses the need to return power to the people (e.g., “direct”, “referendum”).

The manifesto of Jesus dos Passos Vaz, a mayoral candidate from Serra/ES representing the PRB (right-wing), provides an example of populist rhetoric, where he states: “It is a summarized and serious platform that I present to the people from Serrano, who wish to see true progress in our municipality, coming to put an end to the excesses, corruption, and dishonesty of politicians who have no commitment to the people from Serra.”

For this study, I translated the dictionary from Gennaro et al. (2024) into Portuguese to account for the context and language. The final dictionary used for coding populist content is provided in subsection F. I calculate the usage of populist rhetoric in each document by first computing the term frequency-inverse document frequency (tf-idf) matrix, which accounts for the frequency of words while reducing the weight of words that appear frequently across multiple documents. I then summed the tf-idf values of the words found in the populism dictionary.⁷

2.4 Descriptives

The average number of words per manifesto is 2,150, with a median of 1,446, as shown in Table 3. Social policy issues are the most frequently discussed topic, which is expected given the broad range of subjects that fall under this category. It is important to note that the scores for extremism, partisanship, and populism do not have a straightforward interpretation. For the left-right (L-R) score, which underpins the extremeness measure, the median document's score aligns closely with that of the reference document on the right. A score of 0 falls at the 36th percentile.

⁷To validate the results in the Brazilian context, I applied the same method to the manifestos of candidates from the 2022 Brazilian presidential election. The outcomes align with broader political analyses that classify Jair Bolsonaro and Luiz Inácio Lula da Silva as populist leaders, while Simone Tebet is generally not considered populist Kopittke (2022); Lima-de Sousa, Gómez-Iniesta, and Herranz-de-la Casa (2023). This consistency supports the validity of my scoring approach in capturing populist rhetoric within Brazil. Additionally, as shown in subsubsection II, this measure weakly correlates with ideology, with left-wing manifestos showing slightly higher populism scores, a pattern also noted by Venturelli (2024) using a similar methodology.

Table 3: Descriptives: Issues and Ideological Content

| | Mean | p50 | p90 | se | N |
|-------------|------|------|------|------|-------|
| Bureaucracy | 0.08 | 0.07 | 0.13 | 0.04 | 13344 |
| Social | 0.36 | 0.36 | 0.47 | 0.09 | 13344 |
| Health | 0.10 | 0.10 | 0.16 | 0.05 | 13344 |
| Urban | 0.12 | 0.11 | 0.19 | 0.06 | 13344 |
| Economic | 0.15 | 0.15 | 0.23 | 0.06 | 13344 |
| Crime | 0.02 | 0.02 | 0.04 | 0.02 | 13344 |
| Overlap | 0.11 | 0.10 | 0.19 | 0.07 | 1554 |
| Populism | 0.05 | 0.04 | 0.12 | 0.06 | 13706 |
| Extremeness | 2.47 | 2.14 | 4.77 | 2.18 | 13322 |
| Count | 2150 | 1446 | 4472 | 2578 | 13344 |

Notes: This table presents the means, medians, 90th percentiles, standard deviations, and the number of observations for the share of manifestos dedicated to each topic (as described in Equation 3). It also includes scores for extremeness, partisanship, left-right positioning, the tf-idf populism score for each document, and word count.

Figure 1 shows the distribution of the left-right score for the groups of parties on the left, right, and center of the ideological spectrum. In the appendix, Figure A.III and Figure A.IV show the distribution for parties with more candidates on the left and right, respectively. Figure A.II demonstrates variation across municipalities and over time (2012 and 2020) in how many parties use populist vocabulary in their manifestos.

3 Empirical Method

3.1 The Impact of Revealing the Audits

This paper investigates the causal impact of information about irregularities in public fund usage on political discourse and campaign proposals. To account for the differential effects of audit results, it is important to consider the level of corruption found in the audits when analyzing their influence on political communication. The analysis across these different corruption levels provides a more nuanced understanding of how government audits affect political discourse.

Following Ferraz and Finan (2008), I exploit the timing of the audits to examine these differential effects. Some municipalities were audited close to the election date (October 2012), with the audit covering the mayor's term from 2008 to 2012. However, the results of these audits were not made available before the election. I use these municipalities as the control group, comparing them to municipalities audited before the election, where the results were disclosed prior to voting. The treatment group includes municipalities audited between

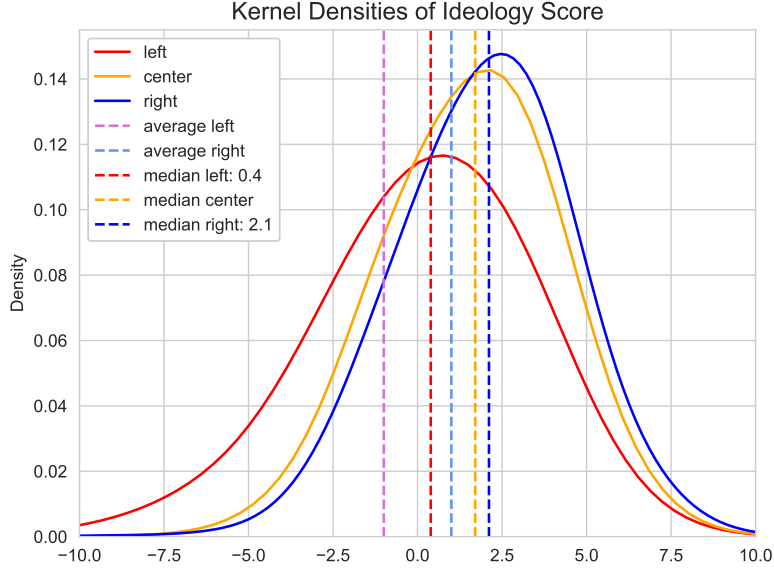


Figure 1: Distribution of Ideological Scores for Left, Center, and Right-Wing Parties. This figure shows the densities of the ideological scores for parties grouped as left, center, or right based on the calculated left-right spectrum.

Notes: The left-right (L-R) score for each manifesto was calculated using the *Wordscores* method (Laver et al., 2003), following the approach of Le Pennec (2024). Each word in the manifestos was assigned a score based on its relative frequency in left-wing and right-wing documents. The overall L-R score for a manifesto is the weighted average of the individual word scores, where words more frequently associated with right-wing parties received positive values, and words associated with left-wing parties received negative values. The extremeness score is defined as the absolute value of the L-R score, reflecting the manifesto's distance from the center of the ideological spectrum.

the 28th and 35th lottery rounds, while the control group comprises those audited between the 36th and 38th rounds. This strategy helps estimate the impact of audit disclosure on political discourse, conditional on the level of corruption found.⁸

The claim about estimating the causal effect of an audit comes from the fact that municipalities were randomly drawn into being audited just before or after the election. Before showing the model to estimate, As shown in Table 2, Table A.VII and Table A.VIII show that observable characteristics between the treatment and control groups are balanced, as expected.

To estimate the effects for both incumbents and challengers,⁹ I use the following model:

$$Outcome_{imst} = \alpha + \beta_0 Disclosure_{mst} + \beta_1 Disclosure_{mst} \times High - Corruption + \quad (5)$$

⁸Some municipalities were audited 71 days before the election, raising concerns that their results were delayed for political reasons. However, audits from 2009 to 2012 show that the average time for results to be disclosed was 217 days (median: 209.5 days; minimum: 178 days), which suggests that the timeline followed established patterns rather than political motivations.

⁹It is important to note that the challengers considered in this analysis are only those running against an incumbent seeking re-election.

$$+\beta_2 High - Corruption + \gamma Controls_{imst} + \nu_s + \varepsilon_{imst}$$

where $Outcome_{imst}$ is the dependent variable for candidate i in municipality m in state s at time t . $Disclosure_{imst}$ is a binary variable indicating whether the audit results were disclosed before the election, and $High - Corruption$ is a binary variable representing whether the number of corruption cases was higher than the median. $Controls_{imst}$ includes a set of municipal controls such as GDP per capita (log), literacy rate, urbanization rate, presence of an AM radio station, Gini index, population dummies, number of mayoral candidates, previous audits, and document word count (log). State fixed effects ν_s are included, and standard errors are clustered at the state level.

The dependent variables include the share of the manifesto dedicated to each topic, populist rhetoric usage, an ideological extremeness index, and a partisanship index. β_0 represents the causal impact of the audit conditional on low corruption, while $\beta_0 + \beta_1$ captures the effect for high-corruption municipalities.

3.2 Multiple Hypothesis Testing

Given that this analysis examines the effects of treatment on seven different outcomes, it is necessary to adjust for the risk of false positives that may arise from multiple hypothesis testing. To address this, I apply the methodology of Anderson (2008), which adjusts p-values to control for the family-wise error rate across the hypotheses. This ensures the robustness and reliability of the results, even when testing multiple outcomes.

I apply this correction separately for incumbents (Group A) and challengers (Group B), recognizing that their distinct roles in the electoral process may lead to different treatment effects. Incumbents and challengers face different incentives, political strategies, and voter bases, which justify treating them as separate groups.

For each of the main estimations in this paper (seven in total, for both challengers and incumbents), I report the p-values adjusted for multiple hypothesis testing using Anderson's approach. This conservative adjustment helps reduce the likelihood of Type I errors, ensuring that the statistical significance reported across the seven outcomes is more reliable.

4 Impact of the Information about Irregularities on the Content of the Manifesto

In this section, I explore whether political candidates adjust their campaign proposals in response to the revelation of corruption information in their respective municipalities.

4.1 Use of Corruption Audit Vocabulary in Political Manifestos

When corruption cases are publicly revealed, they bring attention to governance issues that need to be addressed at the municipal level. It is reasonable to expect that politicians would incorporate this information into their campaigns. This subsection examines whether candidates adopt terms or topics from the corruption reports released before the election in their campaign manifestos. Specifically, I investigate whether candidates in municipalities where corruption reports were disclosed prior to the election are more likely to use language from those reports compared to candidates in municipalities where the reports were not released.

Table 4 presents the results derived from estimating Equation 5, focusing on the frequency with which candidates incorporate language from municipal corruption reports into their campaign manifestos. Columns 1 and 2 of Table 4 show the impact of releasing a corruption report before an election on both opposition candidates and incumbents, while Columns 3 and 4 analyze the effect of the report in municipalities with high and low levels of reported irregularities. To account for potential confounding factors, the regressions control for the number of service orders (as a proxy for report length) and the length of the campaign proposals (both in logs).

Table 4: Does the Disclosure of the Audit Report inform Manifestos?

| Outcome: Overlap Between the Audit-Report and the Manifesto (% of Words on the Audit-Report) | | | | |
|---|---------------------|--------------------|-----------------------------|-----------------------------|
| | (1) | (2) | (3) | (4) |
| Disclosure | 0.010*** (0.003) | 0.014** (0.005) | 0.009** (0.004) [.09] | 0.012* (0.007) [.189] |
| High-Corruption x Disclosure | | | 0.006 (0.006) | 0.005 (0.011) |
| High-Corruption | | | -0.021*** (0.005) | -0.018 (0.013) |
| Candidate | Challengers | Incumbents | Challengers | Incumbents |
| Observations | 459 | 248 | 459 | 248 |
| R-squared | 0.850 | 0.841 | 0.856 | 0.846 |
| Mean of DV | 0.110 | 0.108 | 0.110 | 0.108 |
| $\beta_0 + \beta_1$ | | | 0.0155 | 0.0172 |
| p-value | | | 0.000605 | 0.0270 |
| Adj. p-value | | | [.001] | [.133] |
| Controls | Yes | Yes | Yes | Yes |

Notes: Estimates are derived from Equation 5 for columns 3 and 4 using separate regressions for incumbents and challengers. In columns 1 and 2, no interaction with *High – Corruption* is included. Dependent Variable is a count of all the words in the audit report that are also in the manifesto, divided by the total number of words in the audit report. Only municipalities audited after 2008 are considered (rounds 28-38). Disclosure is a binary variable indicating whether a municipality was audited between 2009 and 2012 and whether the report was made public before the election (rounds 28-35). High-Corruption is a binary variable defined based on the total number of irregularities found during the audit of the municipality, compared to the median number of irregularities identified. Incumbents refers to candidates running for re-election, while challengers are opposition candidates running in a municipality where an incumbent is also contesting. I exclude candidates with manifestos containing fewer than 100 words. All regressions include state fixed-effects. Control variables at the municipality level encompass GDP per capita (in logs), share of illiteracy, share of urban population, Gini index, and indicator variables for populations below 20,000, between 20,000 and 50,000, between 50,000 and 100,000, and above 100,000. There are also binary variables representing whether the candidate belongs to the President's party, the Governor's party, whether the municipality was audited before 2009, and whether there is an AM radio station in the municipality. Numbers in squared brackets represent p-values adjusted for multiple hypothesis testing following Anderson (2008). Clusters are defined at the state level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

Columns 1 and 2 indicate that both opposition candidates and incumbents tend to incorporate more content from the corruption reports into their campaign promises when the reports are released before an election. Specifically, opposition candidates show a 9% increase, while incumbents exhibit a 13% increase in the use of terms from the reports.¹⁰

In Columns 3 and 4, the analysis explores whether the effects differ based on the level of irregularities reported in the municipality. The results in Column 3, which focuses on opposition candidates, remain significant even after adjusting for multiple hypothesis testing. This suggests that the release of corruption reports consistently shapes how opposition candidates craft their campaign proposals, regardless of the number of irregularities revealed.

However, the results in Column 4, which examines the effect for incumbents in municipalities

¹⁰These percentages are calculated by taking the coefficient from the regression and expressing it as a percentage of the mean of the dependent variable.

with both high and low levels of reported corruption, are not statistically significant after adjusting for multiple hypothesis testing. This could be due to the smaller sample size in these regressions, which may reduce statistical power. Although there is a notable trend where incumbents in both high and low corruption municipalities tend to incorporate more content from the reports, this effect does not reach statistical significance in the adjusted results.

In summary, the release of corruption reports appears to influence the campaign content of all candidates, yet, the effect is more robust and statistically significant for opposition candidates. The findings suggest that candidates, particularly those in the opposition, view these reports as valuable input for shaping their campaign narratives. In other words, transparency policies inform politicians' strategies.

4.2 Topics in Candidates' Agenda

The evidence so far suggests that candidates integrate corruption-related information into their campaign discourse. However, the exposure of such corruption cases may also lead candidates to adjust their focus on specific policy areas where irregularities were observed. If certain irregularities make a particular policy issue more urgent, candidates might choose to emphasize it more in their campaign. On the other hand, incumbents may avoid discussing those areas, especially if the irregularities reflect poorly on their past performance and effectiveness in governance.

Table 5 presents the results estimated from Equation 5, assessing the impact of audit report disclosures on the frequency of manifesto content related to health policies (columns 1 and 4), education policies (columns 2 and 5), and economic policies (columns 3 and 6).¹¹ Columns 1-3 focus on the effects of these disclosures on challengers, while columns 4-6 focus on incumbents. Each model includes an interaction with a binary variable indicating whether the proportion of irregularities related to a given policy area exceeds or falls below the median across municipalities. This approach helps isolate the effect of report disclosures on manifesto content, particularly in cities with a significant concentration of irregularities in specific policy areas.

¹¹The analysis focuses on health, education, and economic policies because these were the primary topics audited in lotteries 36-38, which constitute the control group. As such, these topics provide the most comparable basis for evaluating the impact of audit disclosures.

Table 5: Do irregularities on a topic influence the extent to which it is discussed?

| Outcome: Share of Topic on Manifestos (% of Words on the Manifesto) | | | | | | |
|--|----------------------------|-----------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Social | Health | Economy | Social | Health | Economy |
| Disclosure | 0.007 (0.016) [.401] | 0.012* (0.006) [.098] | 0.011 (0.008) [.168] | -0.014 (0.025) [.455] | -0.009 (0.011) [.383] | -0.002 (0.015) [.773] |
| High-Corruption x Disclosure | 0.012 (0.019) | 0.011 (0.014) | 0.012 (0.013) | -0.021 (0.029) | -0.012 (0.014) | -0.053*** (0.013) |
| High-Corruption | -0.018 (0.016) | -0.001 (0.012) | 0.003 (0.012) | 0.024 (0.028) | 0.014 (0.011) | 0.052*** (0.011) |
| Candidate | Challengers | Challengers | Challengers | Incumbents | Incumbents | Incumbents |
| Observations | 474 | 474 | 474 | 257 | 257 | 257 |
| R-squared | 0.14 | 0.21 | 0.14 | 0.16 | 0.22 | 0.21 |
| $\beta_0 + \beta_1$ | 0.02 | 0.02 | 0.02 | -0.04 | -0.02 | -0.06 |
| pval | 0.18 | 0.04 | 0.04 | 0.04 | 0.12 | 0.00 |
| Adj. pval | [.168] | [.098] | [.098] | [.133] | [.199] | [.004] |
| Mean of DV | 0.36 | 0.11 | 0.15 | 0.38 | 0.11 | 0.15 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |

Notes: Estimates are derived from Equation 5. Dependent Variable is the share of each manifesto dedicated to each topic (measured in number of words). Only municipalities audited after 2008 are considered (rounds 28-38). Disclosure is a binary variable indicating whether a municipality was audited between 2009 and 2012 and whether the report was made public before the election (rounds 28-35). High-Corruption is a binary variable defined based on the total number of irregularities found during the audit of the municipality, compared to the median number of irregularities identified. Incumbents refers to candidates running for re-election, while challengers are opposition candidates running in a municipality where an incumbent is also contesting. I exclude candidates with manifestos containing fewer than 100 words. All regressions include state fixed-effects. Control variables at the municipality level encompass GDP per capita (in logs), share of illiteracy, share of urban population, Gini index, and indicator variables for populations below 20,000, between 20,000 and 50,000, between 50,000 and 100,000, and above 100,000. There are also binary variables representing whether the candidate belongs to the President's party, the Governor's party, whether the municipality was audited before 2009, and whether there is an AM radio station in the municipality. Numbers in squared brackets represent p-values adjusted for multiple hypothesis testing following Anderson (2008). Clusters are defined at the state level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

Columns 1-3 indicate that challengers in cities with notable irregularities in a particular policy area tend to allocate more manifesto space to those topics. The effect is especially significant in columns 2 and 3, where there is a 22% increase in the share of manifesto content dedicated to health policy and a 16% increase for economic issues. These coefficients remain significant at the 10% confidence level, even after adjusting for multiple hypothesis testing, indicating robust effects for challengers when addressing these areas.

Conversely, columns 4-6 show that incumbents in cities with significant irregularities are less likely to address those specific policy areas in their manifestos. While the reduction in economic policy focus (column 6) remains significant at the 10% level after multiple hypothesis testing, the results for health policy (column 4) lose significance after this adjustment. This suggests that while incumbents may strategically downplay economic issues, the observed reduction in

attention to health policy may not be as consistently significant.

While all candidates appear to draw on audit report data, the effect of the disclosures diverges in how they shape the overall discourse. Opposition candidates tend to focus more on areas with identified irregularities, likely seeing this as an opportunity to appeal to voters by promising reform or greater oversight. In contrast, incumbents are more hesitant to highlight these areas, likely attempting to minimize potential electoral damage by steering clear of topics that reflect poorly on their past performance.

This behavior aligns with the strategic predictions of Riker (1996). When irregularities concentrate in a particular policy area, they can undermine perceptions of the incumbent's effectiveness, leading them to avoid discussing these subjects. On the other hand, challengers see an opportunity to differentiate themselves and intensify their focus on these areas, hoping to gain an electoral advantage.

To explore the potential mechanisms behind the effects I observe, I examined whether the exposure of audit results before the election influenced the professional backgrounds of candidates. I focused on the health policy area, as it was more straightforward to link to a specific set of professions. Thus, I analyze whether the exposition of a high share of irregularities in the health sector affected the probability of the opposition candidates being health professionals or medical doctors (subsection I). By focusing on municipalities with high and low shares of health-related corruption and analyzing the likelihood of candidates with these professions running for office, I find no significant effect of audit exposure on the likelihood of candidates being health professionals or medical doctors. This suggests that the revelation of corruption in the health sector did not significantly alter the professional profile of candidates, indicating that the focus on health corruption in electoral campaigns is driven by the broader political context rather than by the emergence of health-sector experts as candidates.

4.3 Broad Effects of Audit Disclosures

Beyond analyzing the effects of disclosing corruption cases in high- and low-corruption municipalities, it is useful to explore the broader impact of audit disclosures without focusing on the number of cases uncovered. This section looks at whether any additional insights emerge when considering the overall influence of audits on political manifestos, regardless of the severity of

the findings. By comparing municipalities where specific policy areas were audited with those that were not, I can assess the general effect of audits on political discourse.

The impact of audits on incumbents can be ambiguous because two opposing forces are at play: the audit provides useful information (informational effect) but may also damage the incumbent's reputation if corruption is found (reputational effect). These effects could offset each other, making it difficult to predict how incumbents will react. In contrast, for challengers, both the informational effect and the opportunity to criticize the incumbent align. This makes it more likely that challengers will seize on audit disclosures and use them to emphasize the audited topics in their manifestos, especially if the audit uncovers governance issues.

This analysis leverages the fact that all small municipalities underwent comprehensive expenditure audits, while many larger municipalities with populations exceeding 50,000 were rarely audited on health expenditures. I selected health as the focus for this analysis because it was the only topic for which there was a clear division aligning topic audits and population. This allowed for a clean comparison: small municipalities that were audited were always audited about health, while larger municipalities were not. Thus, I could analyze how being audited for health specifically affected political discourse across municipalities of different sizes. This division provides a unique opportunity to isolate the impact of health audits. If health policy discussions were to increase in larger municipalities that were not audited on health expenditures, it would suggest that other external factors, rather than the specific audit content, are driving the political agenda. Conversely, if discussions of health policy rise in small municipalities that were audited on health, it would imply that the audit itself prompts a more focused discourse on health issues.

Table 6 presents the effects of health expenditure audits on both challengers and incumbents. The control group consists of municipalities that were not audited during the period 2009-2012. This setup is sufficient to estimate the effect of audit exposure, as corruption levels are not being considered in the regression. Columns 1 and 2 display the effects on challengers, while columns 3 and 4 focus on incumbents. Columns 1 and 3 examine municipalities that were audited on health expenditures, while Columns 2 and 4 evaluate municipalities that were not audited in this domain.

Table 6: Do audits on Health Expenditures influence the extent to which Health Policies are discussed?

| Outcome: Share of Health Policies on Manifestos (% of Words on the Manifesto) | | | | |
|--|---------------------|------------------|------------------|------------------|
| | (1) | (2) | (3) | (4) |
| Audited | 0.009*** (0.003) | 0.002 (0.007) | 0.001 (0.004) | 0.011 (0.017) |
| Candidate | Challengers | Challengers | Incumbents | Incumbents |
| Population | Below 50K | Above 100K | Below 50K | Above 100K |
| Observations | 3,283 | 325 | 2,053 | 110 |
| R-squared | 0.063 | 0.140 | 0.053 | 0.413 |
| Mean of DV | 0.106 | 0.0875 | 0.111 | 0.0900 |

Notes: Estimates are derived from Equation 5 without interacting with High-Corruption. Dependent Variable is the share of each manifesto dedicated to Health Policies (measured in number of words). Audited is a binary variable indicating whether a municipality was audited between 2009 and 2012 and whether the report was made public before the election (rounds 28-35). All municipalities are considered to estimate these models. Columns 1 and 3 only look at municipalities with a population below 50,000. Columns 2 and 4 show results for municipalities with a population above 100, excluding those audited on rounds 30, 33 and 35. Incumbents refers to candidates running for re-election, while challengers are opposition candidates running in a municipality where an incumbent is also contesting. I exclude candidates with manifestos containing fewer than 100 words. All regressions include state fixed-effects. Control variables at the municipality level encompass GDP per capita (in logs), share of illiteracy, share of urban population, Gini index, and indicator variables for populations below 20,000, between 20,000 and 50,000, between 50,000 and 100,000, and above 100,000. There are also binary variables representing whether the candidate belongs to the President's party, the Governor's party, whether the municipality was audited before 2009, and whether there is an AM radio station in the municipality. Clusters are defined at the state level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

The results in Column 1 indicate that auditing health expenditures significantly increases the emphasis on health policy among challengers in audited municipalities compared to those that were not audited. Meanwhile, as expected, challengers in municipalities that were not audited on health expenditures show no significant increase in their emphasis on health policy (Column 2). For incumbents, neither set of municipalities shows a significant change in discourse (Columns 3 and 4). These null results may suggest that incumbents are less responsive to audit information regarding health policy, or it could be that the reputational and informational effects cancel each other out.

In the previous section, I showed that incumbents generally reduced their emphasis on areas with high irregularities, although this effect was not significant for health. In this section, however, incumbents do not show any significant change in how much they discuss health, even when their municipalities are specifically audited on health-related issues. For challengers, the results are consistent with earlier findings: they significantly increase their focus on health when audits reveal irregularities in this sector, mirroring their behavior when irregularities in other areas are disclosed.

These findings together suggest that audits serve both as informational and reputational signals. Challengers continue to capitalize on the informational shock of the audit to amplify discussions on audited topics, while incumbents remain cautious, likely due to concerns about reputational damage. This dynamic could explain why incumbents' discourse remains relatively unchanged, even when they are specifically audited in a particular sector, like health, and no major irregularities are found.

Overall, these findings reinforce the idea that the specific content and focus of audit reports influence how politicians prioritize various topics in their campaigns. The opposition tends to use audit disclosures to amplify their critique, especially when irregularities are involved, while incumbents are more cautious, potentially due to the reputational risks audits pose.

5 Impact of Audits on the Use of Ideological Rhetoric

Thus far, I have demonstrated that the revelation of corruption and audit information significantly influences the issues discussed by politicians, particularly for challengers. But does exposing corruption also lead to ideological shifts in candidates' rhetoric? For instance, does it prompt candidates to adjust their ideological focus? In the following analysis, I explore whether these disclosures push candidates to adopt more extreme, partisan, or populist rhetoric in their campaign proposals. To assess this, each manifesto is assigned a score for extremism, partisanship, and populism, as detailed in sections subsection 2.3.3 and subsection 2.3.4, respectively.

Table 7 displays the relationship between corruption disclosures and these ideological indicators. Columns 1-3 of Table 7 present the average effects of audit disclosures on challengers and incumbents, compared to non-audited municipalities. Columns 4-6 introduce an interaction with a binary variable that indicates whether the number of irregularities is above or below the median, allowing for an examination of divergent effects in municipalities with high or low levels of corruption.

Table 7: Do irregularities on a topic influence the ideological framework?

| Outcome: Score for each dimension on Manifestos | | | | | | |
|--|-------------------|--------------------|-------------------|-------------------------------|------------------------------|-----------------------------|
| Panel A: Challengers | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Populism | Extremeness | Partisanship | Populism | Extremeness | Partisanship |
| Disclosure | 0.002 (0.046) | -0.183* (0.096) | -0.055 (0.087) | -0.301** (0.138) [.098] | -0.661** (0.244) [.09] | -0.254 (0.266) [.326] |
| High-Corruption x Disclosure | | | | 0.387** (0.154) | 0.348 (0.465) | 0.194 (0.611) |
| High-Corruption | | | | -0.279** (0.110) | -0.026 (0.368) | 0.105 (0.630) |
| Observations | 3,948 | 3,946 | 3,489 | 474 | 474 | 422 |
| R-squared | 0.111 | 0.058 | 0.025 | 0.134 | 0.154 | 0.126 |
| Mean of DV | 0.0800 | 2.248 | -0.0933 | 0.130 | 2.185 | -0.191 |
| $\beta_0 + \beta_1$ | | | | 0.0861 | -0.313 | -0.0599 |
| p-value | | | | 0.569 | 0.546 | 0.894 |
| Adj. pval | | | | [.401] | [.47] | [.401] |
| Panel B: Incumbents | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Populism | Extremeness | Partisanship | Populism | Extremeness | Partisanship |
| Disclosure | -0.023 (0.058) | 0.212 (0.250) | 0.073 (0.214) | 0.063 (0.096) [.437] | 0.914* (0.520) [.189] | 0.781 (0.657) [.303] |
| High-Corruption x Disclosure | | | | 0.273 (0.170) | -1.466* (0.721) | -1.881* (1.048) |
| High-Corruption | | | | -0.322 (0.206) | 1.233* (0.628) | 1.067 (1.092) |
| Observations | 2,298 | 2,261 | 2,181 | 257 | 254 | 238 |
| R-squared | 0.15 | 0.05 | 0.03 | 0.28 | 0.16 | 0.15 |
| Mean of DV | -0.18 | 2.13 | -0.04 | -0.18 | 2.24 | -0.06 |
| $\beta_0 + \beta_1$ | | | | 0.34 | -0.55 | -1.10 |
| p-value | | | | 0.03 | 0.43 | 0.30 |
| Adj. pval | | | | [.133] | [.383] | [.307] |

Notes: Estimates are derived from Equation 5. Dependent Variable in columns 1 and 4 is the share of each manifesto dedicated to words associated with populism (weighted by tf-idf). The dependent variables in columns 2 and 5 are the Ideological Extremeness scores, and in 3 and 6 are the Partisanship scores. For columns 1-3 all municipalities are considered. For columns 3-6 only municipalities audited after 2008 are considered (rounds 28-38). Disclosure is a binary variable indicating whether a municipality was audited between 2009 and 2012 and whether the report was made public before the election (rounds 28-35). High-Corruption is a binary variable defined based on the total number of irregularities found during the audit of the municipality, compared to the median number of irregularities identified. Incumbents refers to candidates running for re-election, while challengers are opposition candidates running in a municipality where an incumbent is also contesting. I exclude candidates with manifestos containing fewer than 100 words. All regressions include state fixed-effects. Control variables at the municipality level encompass GDP per capita (in logs), share of illiteracy, share of urban population, Gini index, and indicator variables for populations below 20,000, between 20,000 and 50,000, between 50,000 and 100,000, and above 100,000. There are also binary variables representing whether the candidate belongs to the President's party, the Governor's party, whether the municipality was audited before 2009, and whether there is an AM radio station in the municipality. Numbers in squared brackets represent p-values adjusted for multiple hypothesis testing following Anderson (2008). Clusters are defined at the state level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

In Columns 1-3 (Panels A and B), the audit's influence on candidates' ideological orientations appears modest. There is a slight moderation in the rhetoric of opposition candidates following the audit, with some distancing from extreme positions. However, the conditional effects of corruption levels reveal a more robust pattern.

First, Columns 4 and 5 in Panel A show that opposition candidates in municipalities with fewer corruption issues tend to moderate their positions, particularly by distancing themselves from populist rhetoric. This shift represents a reduction of 0.3 standard deviations in populism relative to the sample of all candidates. Additionally, ideological extremism declines by 0.67 points, a 30% reduction from the average, indicating that the moderation observed in Column 2 is driven primarily by candidates in municipalities with lower corruption levels. These results remain robust even after adjusting for multiple hypothesis testing.

Second, when shifting the attention to the incumbents in municipalities with above-median levels of corruption in Column 4 of Panel B, incumbents show a tendency to adopt a more populist discourse after the audit. However, this effect is not robust to multiple hypothesis correction, suggesting that the shift toward populism may not be as consistently significant for incumbents. In contrast, no significant changes are observed in the partisanship dimension (Columns 3 and 6), indicating that incumbents do not necessarily become more partisan, even when they shift toward populist messaging.

These results underscore the nuanced impact of audits on the ideological content of campaigns, with differing effects for incumbents and challengers. Moreover, and as expected, the effect depends significantly on whether the candidate is campaigning in a municipality with low or high corruption levels.

An exploratory analysis (see Table A.IX) reveals that this shift in rhetoric is not driven by increased mentions of specific terms like "corruption" or "transparency," but rather reflects a broader populist approach aimed at reframing their message in the face of reputational shocks. This finding challenges the conventional wisdom that populism is the domain of political outsiders; instead, incumbents can also embrace populist narratives as a strategic response to reputational threats. By appealing to anti-elite and anti-corruption sentiments, incumbents may seek to deflect attention from their governance failures and solidify their base of support.

Finally, the broader regional context seems to play a limited role in shaping candidates' rhetorical strategies (subsection H). The analysis of neighboring municipalities shows that exposure to high or low corruption in adjacent regions does not significantly affect the populism or extremeness of candidates' manifestos. This suggests that electoral dynamics are largely localized, with candidates focusing their rhetorical adjustments on the corruption disclosures within their own municipalities. This localized focus is reinforced by the fact that opposition candidates adjust their rhetoric only when they can directly challenge the incumbents in their municipality. In other words, candidates do not appear to react to broader regional corruption scandals, further highlighting that political messaging is primarily driven by direct electoral incentives at the local level.

6 Discussion and Conclusion

In this comprehensive analysis of 13,344 manifestos from Brazil's 2012 municipal election, I have explored how the exposure of corruption through audit reports influences the content and ideological tone of candidates' proposals. The findings demonstrate that corruption disclosures play a pivotal role in shaping electoral discourse, with effects that vary depending on the level of corruption and whether a candidate is an incumbent or a challenger.

Both incumbents and challengers appear to incorporate language from audit reports into their campaign narratives, reflecting the influence of the informational channel, even when reputational risks for incumbents are present. Notably, the strong impact on challengers, especially in low-corruption municipalities, underscores how the availability of information directly informs and drives electoral discourse. This aligns with the broader expectation that candidates will prioritize issues that resonate with public sentiment and highlight governance failures.

Reputation plays a pivotal role in determining which broader topics candidates choose to emphasize. The evidence shows that audit disclosures, particularly when released pre-election, prompt incumbents to shy away from discussing areas plagued by irregularities. Conversely, challengers seize these issues, amplifying them in their campaigns. This behavior reflects the complex dynamics of electoral accountability, where information on governance failures informs, but also constrains, political messaging. This aligns with theoretical perspectives that suggest

candidates prioritize issues where they perceive a reputational advantage (Riker, 1996; Seeberg, 2022).

As discussed in Appendix B, these candidate responses can be explained by the dual effects of informational and reputational shocks. When audits reveal irregularities, challengers capitalize on the informational shock, using it as a narrative tool to critique incumbents. Meanwhile, incumbents face reputational shocks, discouraging them from addressing topics where they are perceived as vulnerable. This dynamic explains why challengers tend to spotlight problematic areas, while incumbents strategically avoid them to mitigate reputational damage.

The impact of audits extends beyond content selection to the ideological rhetoric employed by candidates. In municipalities with substantial irregularities, incumbents show a tendency toward more populist rhetoric, although these findings are not robust after accounting for multiple hypothesis testing. This shift suggests incumbents may use populist narratives as a strategy to rally their base and deflect attention from policy failures.

In contrast, challengers respond differently. In high-corruption municipalities, where direct attacks on the incumbent might be expected, they do not significantly escalate populist rhetoric. However, in municipalities with lower levels of corruption, where the information disclosed does not directly harm the incumbent, challengers often moderate their rhetoric and avoid strong populist positions. This moderation suggests that appealing to the median voter becomes crucial in less polarized, less competitive electoral environments.

A potential explanation for this moderation is that challengers in low-corruption municipalities may shift their focus from broad ideological themes to more localized issues. This strategic shift from generalized populist rhetoric to specific local concerns (e.g., promises like “build a school” instead of broader, national-level appeals) indicates that candidates may be responding to the specific electoral context rather than simply reacting to the corruption disclosures. If the rhetoric were solely driven by corruption cases, incumbents would likely exhibit similar patterns. The observed moderation by challengers, therefore, could signal a more strategic, localized campaign focus, potentially reflecting a more constructive political environment for voters in these regions.

The findings of this paper extend the existing literature on electoral accountability and populism, showing that transparency affects not only corruption and electoral outcomes (Avis

et al., 2018; Ferraz & Finan, 2008), but also the policy content of campaigns and the ideological tone of political discourse. This study demonstrates that revelations of corruption influence candidates' messaging and framing strategies, with some shifting toward more populist rhetoric, while others adopt a more moderate stance. An important implication of this work is that this shift on the supply side may help understand the changes in electoral outcomes (Ferraz & Finan, 2008) or campaign financing (Poblete-Cazenave, 2021) documented by previous scholars. For instance, the greater success of challengers may not be solely due to the information revealed to citizens, but also because they actively engage with the topics highlighted by the audits. Similarly, incumbents may preemptively adjust their rhetoric to mitigate potential voter or financial backlash.

In sum, these findings emphasize that revelations of corruption have far-reaching consequences on political discourse and campaign strategies. Candidates, particularly challengers, use this information to recalibrate their narratives, while incumbents navigate a delicate balance between addressing or avoiding key issues. The variation in responses underscores the complex interplay between information, reputation, and strategy in shaping the political landscape during campaigns.

Future research should continue to explore how different sources and qualities of information affect political communication. While this study focused on government audits, it raises important questions about how media-driven corruption allegations might alter candidates' strategies. Moreover, understanding whether shifts in ideological rhetoric are a direct response to electoral incentives or an effort to mitigate reputational damage offers an avenue for further inquiry. Ultimately, this research highlights the broader implications of transparency and corruption disclosures for the integrity and content of electoral campaigns, demonstrating how information shapes not just voter behavior but the very language of politics.

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Appendix

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A Figures and Tables

I Figures

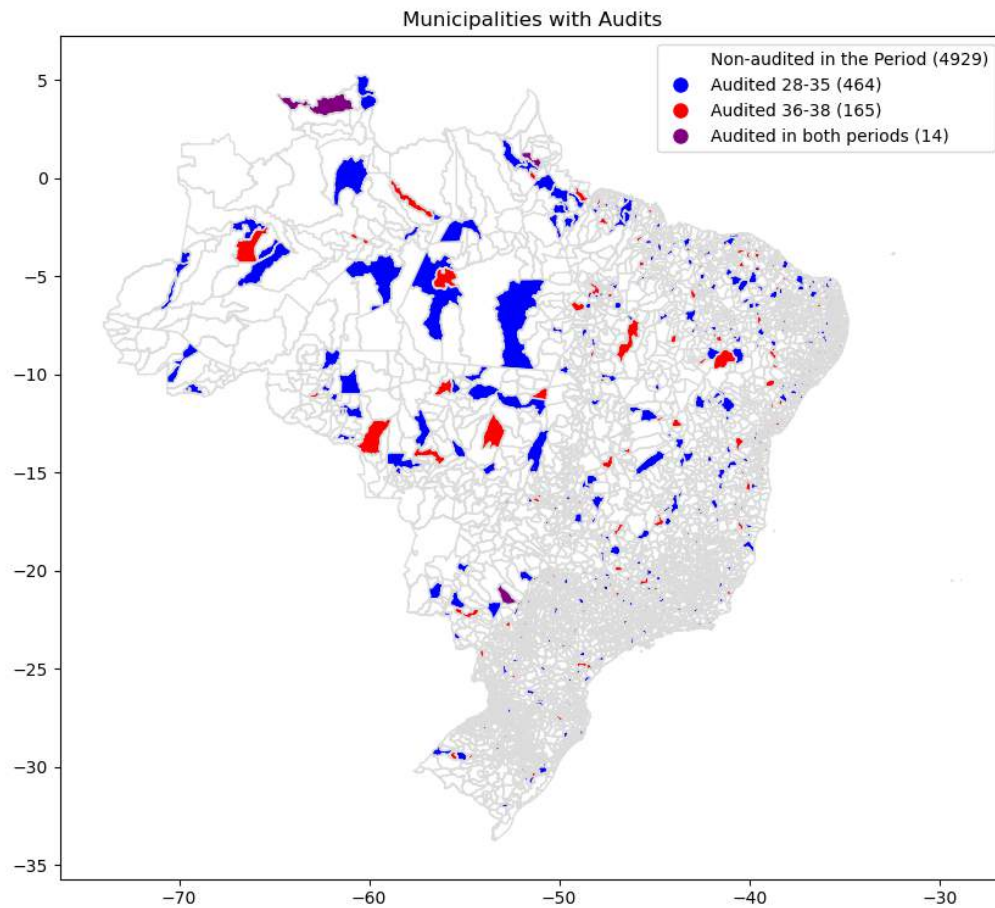
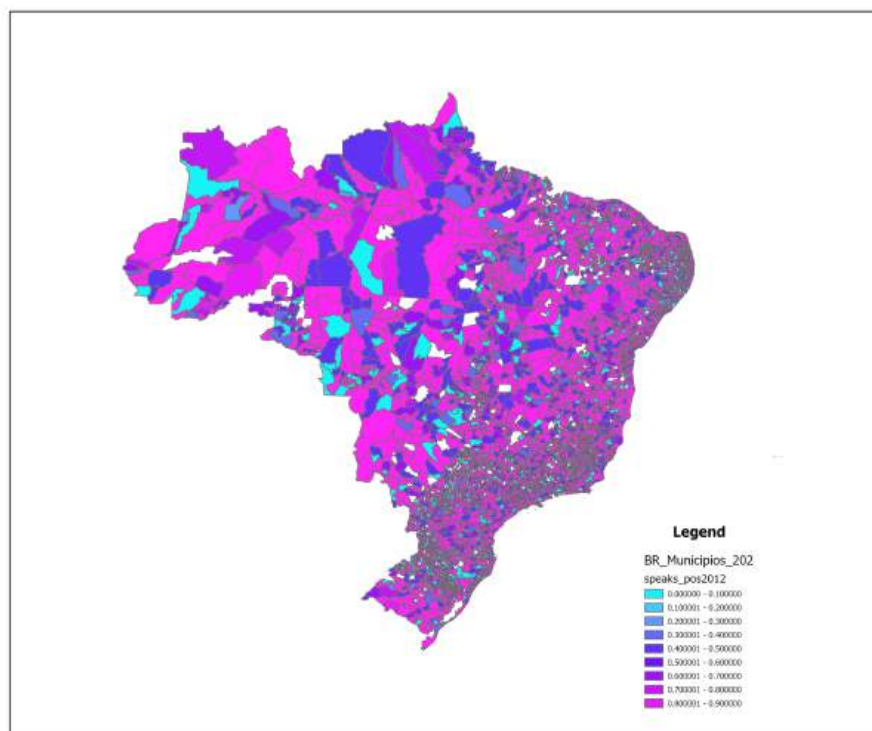


Figure A.I: Audited Municipalities in the Period of Analysis

2012



2020

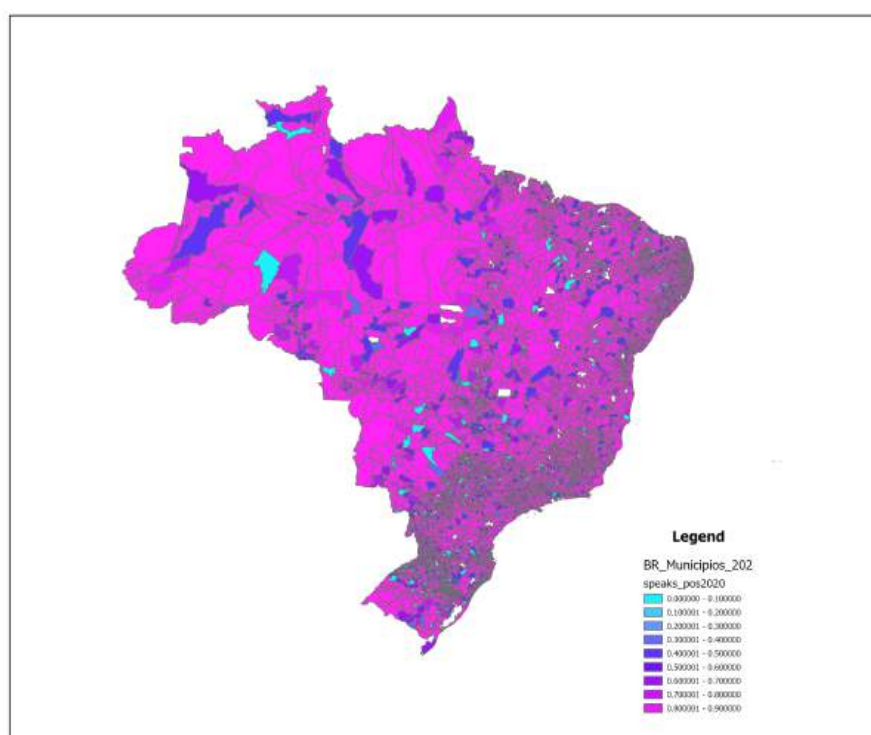


Figure A.II: Percentage of local party manifestos in each municipality that include a populist word

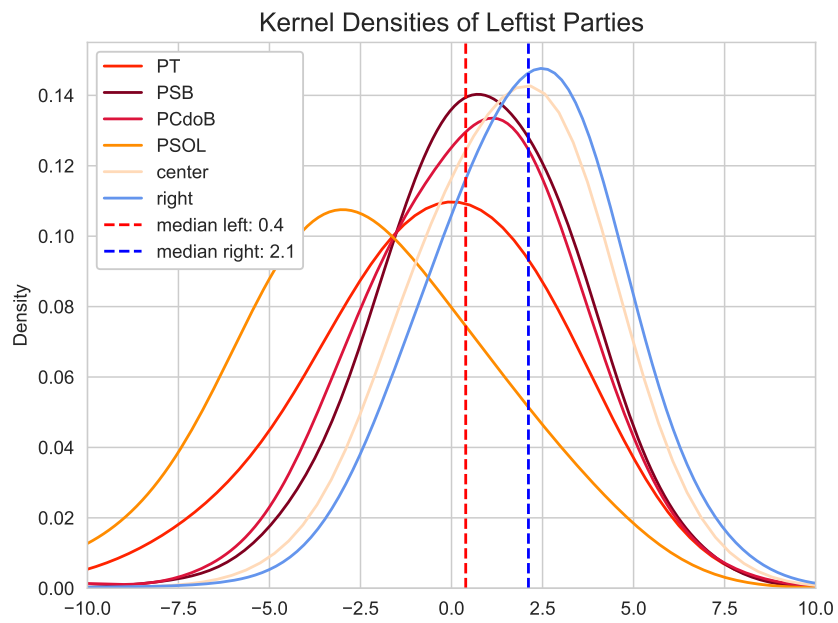


Figure A.III: Ideological Scores' Densities for selected Left-wing parties

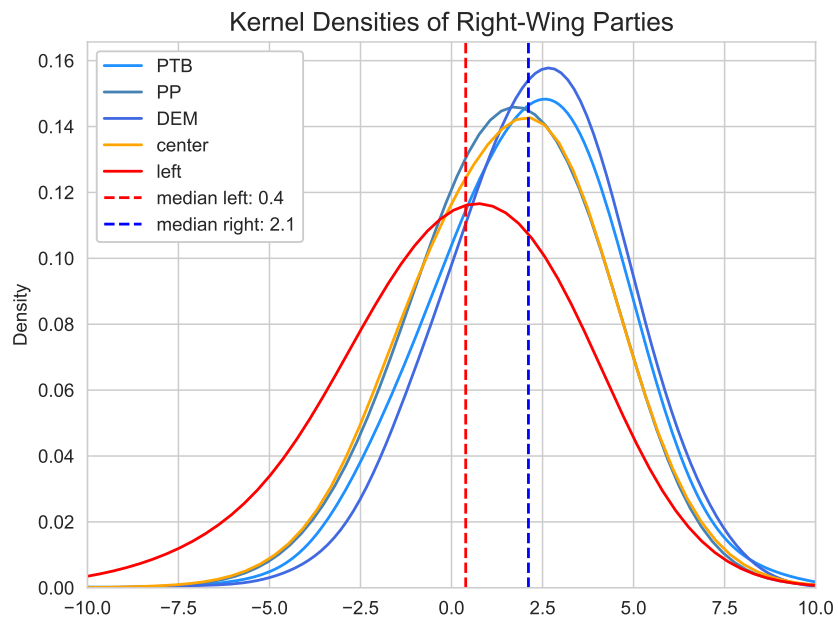


Figure A.IV: Ideological Scores' Densities for selected Right-wing parties

II Tables

Table A.I: Topics covered by the audits in each lottery

| Topic by CGU | Topic | Population Ranges(thousands) | Lotteries | | | | | | | | | |
|------------------------|--------------|------------------------------|-----------|----|----|----|----|----|----|----|----|--|
| | | | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | |
| Agriculture | Econ | 20<x<50 | | X | | | X | | | | | |
| | | 50<x<100 | | X | | | X | | | | | |
| | | x>100 | | X | | | X | | | | | |
| Commerce | Econ | 20<x<50 | | X | | | X | | | | | |
| | | 50<x<100 | | X | | | X | | | | | |
| | | x>100 | | X | | | X | | | | | |
| Crime | Crime | 20<x<50 | | | X | X | | X | | | | |
| | | 50<x<100 | | | X | X | | X | | | | |
| | | x>100 | | | X | X | | X | | | | |
| Culture | Social | 20<x<50 | | X | | | X | | | | | |
| | | 50<x<100 | | X | | | X | | | | | |
| | | x>100 | | X | | | X | | | | | |
| Education | Social | 20<x<50 | X | X | X | X | X | X | X | X | X | |
| | | 50<x<100 | X | X | X | X | X | X | X | | X | |
| | | x>100 | X | | | X | | | X | | X | |
| Health | Health | 20<x<50 | X | X | X | X | X | X | X | X | X | |
| | | 50<x<100 | X | X | X | X | X | X | | X | | |
| | | x>100 | | | X | | | X | | X | | |
| Housing | Urban | 20<x<50 | X | | | | | | | | | |
| | | 50<x<100 | X | | | | | | | | | |
| | | x>100 | X | | | | | | | | | |
| Industry | Econ | 20<x<50 | | | X | X | | X | | | | |
| | | 50<x<100 | | | X | X | | X | | | | |
| | | x>100 | | | X | X | | X | | | | |
| Sanitation | Urban | 20<x<50 | X | | | | | | | | | |
| | | 50<x<100 | X | | | | | | | | | |
| | | x>100 | X | | | | | | | | | |
| Science and Technology | Social | 20<x<50 | | | X | X | | X | | | | |
| | | 50<x<100 | | | X | X | | X | | | | |
| | | x>100 | | | X | X | | X | | | | |
| Services | Bureau/Urban | 20<x<50 | | X | | | X | | | | | |
| | | 50<x<100 | | X | | | X | | | | | |
| | | x>100 | | X | | | X | | | | | |
| Social Assistance | Social | 20<x<50 | X | X | X | X | X | X | | | | |
| | | 50<x<100 | X | X | X | X | X | X | | | | |
| | | x>100 | | X | | | X | | | | | |
| Social Development | Social | 20<x<50 | | | | | | | X | X | X | |
| | | 50<x<100 | | | | | | | X | X | X | |
| | | x>100 | | | | | | | X | X | X | |
| Urban Planning | Urban | 20<x<50 | X | | | | | | | | | |
| | | 50<x<100 | X | | | | | | | | | |
| | | x>100 | X | | | | | | | | | |

Table A.II: Examples of Headings for Each Topic

| Introduction | Administrative Bureaucracy | / | Social | Health | Urban | Economics | Crime | Other |
|--------------------|-------------------------------|-----|---------------------------------------|--------|----------------------------------|--|-------|---------------|
| Concluding Remarks | Administration | | Childhood and Elders | Health | Cleaning | Agriculture | Crime | Communication |
| General Comments | Administration | and | Culture | | Cleaning and Environ- ment | Agriculture and Envi- ronment | | Events Center |
| Introduction | Participation | | Culture and Sport | | Housing | Development | | Funerals |
| | Government Management | | Culture and Sports | | Infrastructure | Economic Develop- ment | | Religion |
| | Participation | | Culture and Tourism | | Infrastructure and Ser- vices | Economic Develop- ment and Sustainable Development | | |
| | Public Finance | | Culture, sport and tourism | | Infrastructure and transport | Employment | | |
| | Public Servers | | Disability | | Street lights | Employment and In- come | | |
| | | | Education | | Natural Disasters | Environment | | |
| | | | Education and Culture | | Sanitation | Environment and Agri- culture | | |
| | | | Education and Sports | | Sanitation and Envi- ronment | Industry and Com- merce | | |
| | | | Education, Culture and Sports | | Streets | Production | | |
| | | | Elders | | Transit | Rural | | |
| | | | Gender | | Transport | Solidarity Economy | | |
| | | | Social | | Urban | Sustainable Develop- ment | | |
| | | | Social Assistance | | Urban and housing | | | |
| | | | Social Development | | Urban Development | | | |
| | | | Social Policies | | Water | | | |
| | | | Social Policy | | | | | |
| | | | Sports | | | | | |
| | | | Sports and Culture | | | | | |
| | | | Sports and Tourism | | | | | |
| | | | Sports and Youth | | | | | |
| | | | Sports, culture, youth and tourism | | | | | |
| | | | Tourism | | | | | |
| | | | Tourism, Culture and Sports | | | | | |
| | | | Youth | | | | | |
| | | | Youth, Gender and El- ders | | | | | |

Table A.III: Number of Irregularities per Policy Area

| Policy Area | N | Percentage |
|-------------|--------|------------|
| Bureaucracy | 58 | 0.2% |
| Crime | 138 | 0.4% |
| Economics | 1,494 | 4.1% |
| Health | 10,207 | 28.2% |
| Social | 21,644 | 59.8% |
| Urban | 1,818 | 5.0% |
| Other | 811 | 2.2% |

Notes: Percentages refer to the percentage of total cases in lotteries between the 28th and the 38th.

Source: TSE.

Table A.IV: Distribution of Topics in the Corpus

| Outcome: Share of Topic on Manifestos (% of Words on the Manifesto) | | |
|---|--------|-----------------|
| | Sample | Soft Prediction |
| Titles | 2.9 | 2.1 |
| Introduction & Other topics | 14.9 | 15.8 |
| Administrative / Bureaucracy | 8.3 | 8.7 |
| Social | 31.3 | 35.4 |
| Health | 9.5 | 8.7 |
| Urban | 10.6 | 9.6 |
| Economics | 13.9 | 10.7 |
| Crime | 2.5 | 2.2 |
| Unrecognizable characters | 6.2 | 1.0 |

Notes: Column 1 represents the topic distribution in the sample of 100 manifestos used to tune the model. Column 2 represents the topic distribution using the soft measure described in section 2.

Table A.V: Words with the lowest (left-wing) and highest (right-wing) scores

| Leftist Words | | Right-wing Words | |
|---------------|--------------|------------------|------------------|
| cidasc | ^a | democratas | democrats |
| petista | ^b | cristao | Christian (masc) |
| capitalista | capitalist | crista | Christian (fem) |
| petistas | ^b | democrata | democrat |
| socialismo | socialism | republicano | republican |
| inverter | reverse | farei | will do |
| deliberativos | deliberative | indeb | ^c |
| desiguais | unequal | renova | renew |
| socialistas | socialists | equoterapia | equine therapy |
| dominante | dominant | grafias | spellings |

Notes:

^a *cidasc*: Companhia Integrada de Desenvolvimento Agrícola do Estado de Santa Catarina (Cidasc). This is an agropecuarian policy in Santa Catarina.

^b *petista*: Member of the Workers Party (PT)

^c *indeb*: Basic Education Development Index (Indeb)

Table A.VI: Mean Comparisons between Audited and Nonaudited Municipalities

| | Control | Treatment | Difference |
|--|------------------------|----------------------|---------------------|
| GDP pc | 12886.52 [14487.15] | 10805.9 [9571.88] | -819.3 [569.971] |
| Share Illiterate (%) | 85.3472 [8.86] | 83.51522 [9.33] | -0.0758 [0.258] |
| Share Urban | 0.6374198 [0.22] | 0.6262824 [0.21] | 0.00446 [0.007] |
| Share Secondary Education and above | 0.2156972 [0.08] | 0.2083799 [0.08] | 0.000671 [0.003] |
| Share of Bureaucrats with Superior Education | 0.3069009 [0.11] | 0.2967605 [0.11] | -0.00219 [0.004] |
| HDI | 0.6598012 [0.07] | 0.6443488 [0.07] | -0.00108 [0.002] |
| AM radio | 0.2092931 [0.41] | 0.1987315 [0.4] | -0.00137 [0.025] |
| Gini | 0.5013802 [0.07] | 0.5095829 [0.06] | -0.0014 [0.002] |
| Population (logs) | 9.377024 [1.09] | 9.470213 [1.1] | 0.00526 [0.032] |
| Audited Previously | 0.2499018 [0.43] | 0.2635983 [0.44] | -0.0113 [0.021] |
| Observations | 5090 | 478 | |

Notes: Estimates are means and standard deviations (in brackets) of various municipal characteristics by places that have been audited in the period 2009-2012 (Treatment) and places that have not been audited in that period (control). The difference and corresponding standard error (in brackets) are computed on the basis of a regression that controls for state.

Table A.VII: Mean Comparisons between Audited and Nonaudited Municipalities (High Corruption)

| | Control | Treatment | Difference |
|--|----------------------|---------------------|-----------------------|
| GDP pc | 6082.53 [4420.41] | 9279.5 [9042.16] | 2142.9* [1142.474] |
| Share Illiterate (%) | 78 [7.98] | 81.04 [9.21] | 1.33 [1.211] |
| Share Urban | 0.55 [0.2] | 0.61 [0.21] | 0.05 [0.039] |
| Share Secondary Education and above | 0.18 [0.06] | 0.2 [0.08] | 0.02 [0.013] |
| Share of Bureaucrats with Superior Education | 0.29 [0.12] | 0.29 [0.12] | -0.01 [0.029] |
| HDI | 0.6 [0.06] | 0.62 [0.07] | 0.01 [0.009] |
| AM radio | 0.14 [0.36] | 0.2 [0.4] | 0.09 [0.091] |
| Gini | 0.53 [0.04] | 0.53 [0.05] | 0.0191* [0.010] |
| Population (logs) | 9.5 [0.86] | 9.66 [1.02] | 0.34 [0.210] |
| Audited Previously | 0.29 [0.46] | 0.29 [0.46] | -0.01 [0.103] |
| Observations | 21 | 131 | |

Notes: Estimates are means and standard deviations (in brackets) of various municipal characteristics by places that have been audited in round 28 to 35 (2009-2012) and places that have been audited in rounds 36 to 38 with a high level of corruption (defined by the median of irregularities found). The difference and corresponding standard error (in brackets) are computed on the basis of a regression that controls for state.

Table A.VIII: Mean Comparisons between Audited and Nonaudited Municipalities (Low Corruption)

| | Control | Treatment | Difference |
|--|------------------------|------------------------|-----------------------|
| GDP pc | 17136.57 [24649.26] | 13572.12 [12166.64] | -1596.1 [3520.809] |
| Share Illiterate (%) | 87 [8.65] | 87.39 [8.02] | 1.371* [0.731] |
| Share Urban | 0.64 [0.25] | 0.66 [0.21] | 0.0245 [0.034] |
| Share Secondary Education and above | 0.22 [0.08] | 0.22 [0.09] | 0.0141 [0.012] |
| Share of Bureaucrats with Superior Education | 0.32 [0.14] | 0.3 [0.1] | -0.0118 [0.026] |
| HDI | 0.68 [0.06] | 0.67 [0.07] | 0.00408 [0.007] |
| AM radio | 0.25 [0.44] | 0.19 [0.4] | -0.00734 [0.092] |
| Gini | 0.49 [0.07] | 0.5 [0.06] | 0.00901 [0.011] |
| Population (logs) | 9.4 [1.28] | 9.33 [1.17] | 0.101 [0.197] |
| Audited Previously | 0.2 [0.41] | 0.27 [0.45] | 0.131* [0.074] |
| Observations | 44 | 108 | |

Notes: Estimates are means and standard deviations (in brackets) of various municipal characteristics by places that have been audited in round 28 to 35 (2009-2012) and places that have been audited in rounds 36 to 38 with a low level of corruption (defined by the median of irregularities found). The difference and corresponding standard error (in brackets) are computed on the basis of a regression that controls for state.

Table A.IX: Do irregularities on a topic influence the frequency of specific words?

| Outcome: Frequency of words on Manifestos (% of Words on the Manifesto) | | | | |
|--|--------------------|---------------------|-------------------|---------------------|
| Panel A: Challengers | | | | |
| | (1) Corruption | (2) Transparency | (3) Corruption | (4) Transparency |
| Disclosure | -0.000 (0.000) | -0.000 (0.000) | -0.000 (0.000) | 0.000 (0.000) |
| High-Corruption x Disclosure | | | 0.000 (0.000) | 0.000 (0.000) |
| High-Corruption | | | 0.000 (0.000) | -0.001* (0.000) |
| Observations | 3,948 | 3,948 | 474 | 474 |
| R-squared | 0.027 | 0.069 | 0.130 | 0.107 |
| Mean of DV | 5.46e-05 | 0.00200 | 6.14e-05 | 0.00181 |
| $\beta_0 + \beta_1$ | | | -4.81e-05 | 0.000499 |
| p-value | | | 0.605 | 0.261 |
| Panel B: Incumbents | | | | |
| | (1) Corruption | (2) Transparency | (3) Corruption | (4) Transparency |
| Disclosure | -0.000* (0.000) | -0.000 (0.000) | -0.000 (0.000) | -0.000 (0.000) |
| High-Corruption x Disclosure | | | -0.000 (0.000) | 0.000 (0.000) |
| High-Corruption | | | 0.000 (0.000) | -0.000 (0.000) |
| Observations | 2,298 | 2,298 | 257 | 257 |
| R-squared | 0.010 | 0.056 | 0.093 | 0.254 |
| Mean of DV | 2.03e-05 | 0.00185 | 1.01e-05 | 0.00173 |
| $\beta_0 + \beta_1$ | | | -3.13e-05 | 0.000276 |
| p-value | | | 0.556 | 0.419 |

Notes: Estimates are derived from Equation 5. Dependent Variable in columns 1 and 3 is the share of each manifesto dedicated that start with 'corrup'. Dependent Variable in columns 2 and 4 is the share of each manifesto dedicated that start with 'transp'. For columns 1-2 all municipalities are considered. For columns 3-4 only municipalities audited after 2008 are considered (rounds 28-38). Disclosure is a binary variable indicating whether a municipality was audited between 2009 and 2012 and whether the report was made public before the election (rounds 28-35). High-Corruption is a binary variable defined based on the total number of irregularities found during the audit of the municipality, compared to the median number of irregularities identified. Incumbents refers to candidates running for re-election, while challengers are opposition candidates running in a municipality where an incumbent is also contesting. I exclude candidates with manifestos containing fewer than 100 words. All regressions include state fixed-effects. Control variables at the municipality level encompass GDP per capita (in logs), share of illiteracy, share of urban population, Gini index, and indicator variables for populations below 20,000, between 20,000 and 50,000, between 50,000 and 100,000, and above 100,000. There are also binary variables representing whether the candidate belongs to the President's party, the Governor's party, whether the municipality was audited before 2009, and whether there is an AM radio station in the municipality. Clusters are defined at the state level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

B Information about Corruption and Manifestos

This section aims to provide a brief explanation of why there is an expected effect of the availability of information about irregularities in the government on the proposals outlined in political candidate manifestos. Past audits serve as a proxy for increased knowledge about government actions and irregularities in using public funds in local governments. The effect of the audits could be synthesized through two main channels.

First, the increasing amount of information could have an effect in and of itself (an information shock) by informing the public about government issues (e.g., how much the local government spends on hospital wages). Politicians have responded to audits by changing their practices in government through political selection and a disciplining effect (Avis et al., 2018; Gonzales, 2021; Lauletta et al., 2022). This paper analyzes whether the audit information could affect how candidates frame their proposals and communicate with voters.

Second, in a municipality with a high (low) corruption level, the audit could lead to a negative (positive) reputation shock for the mayor. I look at these effects on the agenda (how much of each policy issue is discussed), and in the ideological content of the language employed. Studies have investigated the impact of an audit's reputational shock on election outcomes (Cavalcanti et al., 2018; Ferraz & Finan, 2008; Poblete-Cazenave, 2021).

I Information about Corruption on Issue Selection

Each manifesto line addresses a specific policy issue, determining the candidate's emphasis on each topic. The distribution of issues in a manifesto likely aims to increase the relevance of those topics in the campaign and influence voters when determining their preferences. There are at least two ways that information about government actions can impact a candidate's agenda.

First, from an electoral accountability perspective, auditing can raise awareness of bureaucratic, administrative, and governance issues among voters, which could prompt candidates to address these issues in their campaigns if the results of the audit were negative. This could also lead to changes in what voters and politicians consider as optimal policies in each area, causing politicians to describe their proposals in greater detail for these issues (Abou-Chadi et al., 2020; Williams et al., 2016). Both incumbent and challenger may address the issue (Seeberg, 2022). This could happen even if there is not a negative reputation shock, and it only provides new information that affects their policy views and voters' demands (e.g. Gagliarducci, Paserman, & Patacchini, 2019). Candidates may also want to reproduce this information in their campaigns to raise awareness among voters. This highlights the role that auditing plays in shaping the policy debate and determining the issues that are discussed during election cycles. This means that audits that find a high number of irregularities in specific areas could lead to candidates discussing these topics more.

Second, the literature on issue selection also addresses the relationship between reputation, electoral advantage, and issue selection. Following Riker (1996), a candidate will appeal to a specific issue only if they dominate the other candidates in terms of persuasion. A reputational shock resulting from the audit could be seen as affecting the perceived advantage on that policy area. However, Aragonès, Castanheira, and Giani (2015) and Dragu and Fan (2016) show that in specific contexts, parties with a disadvantage in a topic could choose to discuss it more.

In conclusion, the availability of information about government activities, as indicated by audits, can have a significant impact on the distribution of policy issues discussed in political candidate manifestos. The information provided by audits can serve as a source of new policies for candidates and highlight problems that need attention. This may lead to an increase in

the attention given to certain topics by all candidates. However, reputational shocks can also influence the extent to which a candidate addresses certain issues in their manifesto. In a setting where corruption cases shape reputation, a positive (negative) reputation shock can result in an increase (decrease) in the attention given to a specific issue by the incumbent candidate, while the opposite is true for their challenger.

II Information about Corruption on Partisanship and Extremeness

Manifestos are placed on the left-right political axis based on their national party affiliation, which allows for the calculation of two measures: partisanship and extremeness. There is a body of literature that examines how changes in reputation can affect policy positioning. An increase or decrease in reputation can lead to a shift toward the center or towards extremism.

Starting from a similar reputation level, an increase in reputation can result from a positive shock for an incumbent or a negative shock for a challenger. If a candidate experiences an increase in reputation, they are likely to adopt a policy closer to their preferred stance, while their opponent moves towards the center (e.g. Serra, 2010). However, after the reputation has increased, the candidate may choose to emphasize this valence advantage to win (Groseclose & Milyo, 2005). As a result, they may converge on their policy position.

This paper is relevant to the context of Bernhardt et al. (2020), as the candidates for the mayor position are running simultaneously with the city council candidates. Even if the mayoral candidates lose, they aim to retain as many votes as possible. If the popularity advantage is small, they adopt a policy the median voter prefers. For moderate advantages, the disadvantaged candidate adopts a policy closer to its core supporters to retain as many seats as possible, while the advantaged candidate does not move towards the other candidate unless the popularity advantage is substantial.

It is important to note that candidates and parties do not always propose their ideal policies and often move towards the center, which can result in a bias towards the center in national party positioning. Therefore, any movement after an audit will also affect partisanship.

In conclusion, the policy choices made by candidates, as measured by their manifestos, may be influenced by reputational shocks, but the direction of this influence can vary. Nevertheless, the results of audits are expected to impact these choices.

III Information about Corruption on Populism

Several papers have reviewed the determinants of populism (Berman, 2021; Guriev & Papaioannou, 2022). They show that different mechanisms can explain the rise of populism.

For example, corruption is often a topic that is associated with populist rhetoric (Berman, 2021). This paper, populism is measured using a dictionary that focuses on how populist politicians use the rhetoric of “us vs. the elite.” Audits can make corruption and transparency issues more prominent, leading politicians to respond strategically by incorporating populist rhetoric. This is because I know that politicians supply populist rhetoric based on the demands of their audience (Gennaro et al., 2024). As a result, increasing public awareness of corruption in government may result in an increase in the strategic use of populist rhetoric, particularly by the opposition. However, even the incumbent mayor could increase the usage of this language if the irregularities disclosed are not their responsibility.

Another effect could be through electoral competitiveness. Studies show that negative reputational shocks on the incumbent can lead to increased electoral competitiveness Poblete-Cazenave (2021). In this context, using populist language could serve as a way to differentiate.

Finally, releasing more accurate information to the public may also decrease the use of populist language if it helps prevent the spread of false news (Guriev & Papaioannou, 2022).

This is particularly relevant in a municipality with low levels of corruption, where the audit could make it difficult for opposition candidates to accuse the incumbent of being part of the “corrupt elite” (Guriev & Papaioannou, 2022).

C Preprocessing Manifestos

The preprocessing steps were:

- Converted each pdf files into a json format.
- Any empty json files was removed.
- For the topic analysis, the next step was transforming each entry in the json file into a line in the pdf.
- Stop words were removed from each line. The stop words used for the topic analysis were those included in nltk for the Portuguese language.
For the analysis where I looked at the frequency of the populist words, I also excluded the parties names, the state names, and the names of each candidates. This was done to reduce the total count of words and imbalances that could be generated by the use of these removed terms.
- The tokenization process was then performed and punctuation signs were removed. In all cases 1-word n-grams where used.

D Classifier Performance Analysis

To determine the most effective classification algorithm for categorizing manifesto lines into policy areas, I evaluated five distinct supervised machine learning classifiers: Multinomial Naive Bayes (NB), K-Nearest Neighbors (KNN), Support Vector Classifier (SVC), Random Forest (RF), and Long Short-Term Memory (LSTM) networks. Additionally, parallel processing was implemented to enhance computational efficiency, allowing multiple parameter configurations to be evaluated simultaneously and thereby reducing the overall training time. Following (González-Rostani, Incio, & Lezama, 2024), I also leveraged OpenAI's API with GPT-4 to classify the sentences into the same nine topics used in the other methods.

For NB, KNN, SVC, and RF, I employed scikit-learn's Pipeline and GridSearchCV to streamline the preprocessing and hyperparameter tuning processes. These classifiers utilized Term Frequency-Inverse Document Frequency (TF-IDF) as the first step in the Pipeline for text vectorization, enabling the transformation of textual data into meaningful numerical representations. Hyperparameter optimization was conducted with a focus on maximizing the weighted F1-score, ensuring balanced precision and recall across all policy topics.

The F1-score is a performance metric that combines both precision and recall, providing a single measure of a classifier's accuracy by taking their harmonic mean. It is particularly useful in scenarios with class imbalances, as it accounts for both false positives and false negatives. The weighted F1-score further refines this metric by averaging the F1-scores of all classes, weighted by the number of true instances for each class. This approach ensures that the performance of more prevalent classes has a proportionate impact on the overall score, leading to a more balanced evaluation of the classifier's effectiveness across all policy areas. By prioritizing the weighted F1-score, I aimed to select models that not only perform well overall but also maintain consistent performance across each individual policy category.

This section details the tools and methodologies used for each classifier, the parameterizations implemented, and the resulting performance metrics, including accuracy and F1-scores.

I Multinomial Naive Bayes (NB)

The Naive Bayes classifier is suitable for discrete feature counts.

Parameterization A grid search was conducted to identify the optimal hyperparameters:

- N-gram range: Evaluated the use of unigrams (single words) versus bigrams (pairs of consecutive words) to capture different levels of context in the text.
- Stop Words removal: Assessed the effect of removing common stop words from the text to reduce noise and improve model performance.
- Tokenization strategy: Compared standard tokenization with Snowball stemming to determine the best approach for preprocessing the text data.
- Smoothing parameter: Tested various smoothing levels to handle zero-frequency issues and improve the classifier's robustness.

The grid search utilized 5-fold cross-validation, optimizing for the weighted F1-score, and was executed with parallel processing to enhance computational efficiency.

II K-Nearest Neighbors (KNN)

The KNN algorithm classifies each line based on the majority class among its nearest neighbors in the feature space.

Parameterization The grid search explored the following hyperparameters:

- N-gram Range: Evaluated the impact of using unigrams versus bigrams on the classifier's performance.
- Stop Words Removal: Tested the inclusion and exclusion of stop words to determine their effect on classification accuracy.
- Tokenization Strategy: Compared standard tokenization with Snowball stemming to identify the most effective preprocessing method.
- Distance Metric Power Parameter: Defined the power parameter for the Minkowski distance metric, influencing how distance is calculated between points.
- Number of Neighbors: Specified the number of nearest neighbors to consider when making classifications.

The grid search employed 5-fold cross-validation with parallel processing to optimize computational resources.

III Support Vector Classifier (SVC)

The SVC algorithm identifies the optimal hyperplane that separates different classes in the feature space.

Parameterization The hyperparameters tuned included:

- N-gram Range: Assessed the use of unigrams versus bigrams to capture varying contextual information.
- Stop Words Removal: Evaluated the impact of removing stop words on the classifier's ability to accurately categorize text.
- Tokenization Strategy: Compared standard tokenization with Snowball stemming to enhance text preprocessing.
- Probability Estimates: Enabled the calculation of probability estimates for each class, allowing for more nuanced classification decisions.

The grid search utilized 5-fold cross-validation with parallel processing to efficiently explore the hyperparameter space.

IV Random Forest (RF)

RF is an ensemble method that constructs multiple decision trees during training and outputs the mode of the classes.

Parameterization The grid search explored the following hyperparameters:

- N-gram Range: Investigated the use of unigrams versus bigrams to determine their effect on model performance.
- Stop Words Removal: Assessed the removal of stop words to reduce feature space and noise.

- **Tokenization Strategy:** Compared standard tokenization with Snowball stemming to optimize text preprocessing.
- **Number of Trees:** Tested different numbers of trees in the forest to balance model complexity and performance.
- **Maximum Tree Depth:** Explored various maximum depths for the decision trees to prevent overfitting and improve generalization.
- **Minimum Samples for Split:** Determined the minimum number of samples required to split an internal node, influencing tree growth.
- **Minimum Samples for Leaf:** Defined the minimum number of samples required to be at a leaf node, controlling tree complexity.

A 3-fold cross-validation was employed with parallel processing to balance computational efficiency and thoroughness.

V Long Short-Term Memory (LSTM) Networks

Tools and Methodology The LSTM classifier was developed using TensorFlow's Keras API, which facilitates the construction and training of deep learning models. The preprocessing pipeline involved tokenization and padding to prepare text data for the neural network.

Model Architecture

1. **Embedding Layer:** Converts words into dense vectors of fixed size (128 dimensions), capturing semantic relationships.
2. **LSTM Layer:** A single LSTM layer with 64 units to capture sequential dependencies in the text.
3. **Dense Output Layer:** A softmax-activated layer with units equal to the number of policy topics, enabling multi-class classification.

The model was compiled with the Adam optimizer and trained using sparse categorical cross-entropy loss. Accuracy was monitored as the primary metric.

Parameterization Key parameters included:

- **Vocabulary Size:** Evaluated different vocabulary scopes: 1000, 1500, 2000, and 2500 words, to determine the optimal range for capturing relevant terms.
- **Sequence Length:** Fixed at 200 tokens to standardize input lengths and ensure consistency across samples.
- **Number of Epochs:** Set to 7 to prevent overfitting while allowing sufficient learning during training.
- **Batch Size:** Set to 64 for efficient training and to balance memory usage with training speed.

The text data was preprocessed by tokenizing and padding sequences to the defined sequence length.

VI OpenAI-Based Classification

Tools and Methodology In addition to the traditional machine learning and deep learning classifiers, I employed an OpenAI-based model, specifically leveraging the GPT-4 architecture, to classify manifesto sentences into the predefined nine policy categories. This approach was inspired by (González-Rostani et al., 2024) and aimed to utilize the advanced natural language understanding capabilities of GPT-4 for nuanced text classification tasks.

Classification Process The classification process using the OpenAI model involved the following steps:

1. **Category Definitions:** I used the same categories used in the other classifiers. The summaries of each topics were made by ChatGPT based on the example titles of Table A.II. The categories included:
 - **Titles:** Sentences that contain or reference the title of a document or section.
 - **Introduction:** Sentences that introduce a topic, provide an overview, or set the stage for the content.
 - **Administrative/Bureaucracy:** Sentences related to public servants, government administration, participation in governance, or public finance.
 - **Social Issues:** Sentences about education, culture, sports, tourism, or social policies related to youth, gender, or social development.
 - **Health:** Sentences specifically related to healthcare, public health policies, or medical services.
 - **Urban:** Sentences referring to transportation, infrastructure, urban development, housing, sanitation, or disaster management.
 - **Economics & Environment:** Sentences related to environmental issues, agriculture, rural development, sustainable development, or economic production.
 - **Unrecognizable Sentences:** Sentences that are empty, nonsensical, or don't provide any valuable information.
 - **Crime/Security:** Sentences related to security, law enforcement, or public safety.
 - **Other:** Sentences that don't fit into any other categories, including events, funerals, communication, religion, or miscellaneous topics.
2. **Prompt Construction:** For each sentence in the test dataset, a tailored prompt was created to instruct the GPT-4 model to classify the sentence. The prompt combined the category descriptions with the sentence to be classified to provide clear context.

The structured prompt ensures that the model has clear definitions for each category, enhancing the accuracy of its classifications.
3. **API Configuration:** The OpenAI API was configured with specific parameters to optimize classification performance:
 - **Model:** gpt-4o-mini-2024-07-18 – a specialized variant of GPT-4 tailored for classification tasks.
 - **Temperature:** Set to 0.1 to minimize randomness and promote deterministic outputs.

- **Max Tokens:** Limited to 5 tokens to ensure that the model returns only the category name without additional text.
 - **System Instructions:** The prompt also included some context on the exercise: "You are an assistant that helps categorize sentences or lines of manifestos. These are manifestos for the mayor position in Brazil in 2012."
4. **Classification Execution:** For each sentence in the test set, the constructed prompt was sent to the OpenAI API. The model's response was then parsed to extract the assigned category. This process was iterated over all sentences in the test set, resulting in a complete set of predictions.

Advantages and Limitations The use of an OpenAI-based model offers several advantages:

- **Contextual Understanding:** The model's ability to comprehend context and subtle language nuances leads to more accurate classifications.
- **Flexibility:** Easily adaptable to different classification schemes with appropriate prompt engineering.
- **Scalability:** Capable of handling large datasets efficiently due to its optimized architecture.

However, there are also limitations:

- **Cost:** Utilizing the OpenAI API can be more expensive compared to running local models, especially with large datasets. In this case, the cost of 6,149 observations was 0.29 USD.
- **Dependency on External Service:** Reliance on an external API may pose challenges related to data privacy and service availability.
- **Proprietary Nature:** Limited transparency into the model's internal workings compared to open-source alternatives.

The execution time, using Google Colab (on its free version, on 10/11/2024), of classifying the 6,149 observations was 48 minutes.

VII Results Description and Summary

Table D.X: Model Performance Comparison

| Model | F1 Weighted | Accuracy |
|------------|-------------|----------|
| NB | 0.6278 | 0.6308 |
| KN | 0.4332 | 0.4123 |
| SVC | 0.6269 | 0.6357 |
| RF | 0.3508 | 0.4236 |
| LSTM_1 | 0.1971 | 0.2111 |
| LSTM_2 | 0.1979 | 0.2041 |
| LSTM_3 | 0.1913 | 0.1981 |
| LSTM_4 | 0.1964 | 0.2023 |
| OpenAI_num | 0.4989 | 0.4804 |

Results Description As shown in Table D.X, the Multinomial Naive Bayes (NB) and Support Vector Classifier (SVC) models achieved the highest performance metrics among the evaluated classifiers. The NB model attained a weighted F1-score of 0.6278 and an accuracy of 0.6308, while the SVC model closely followed with a weighted F1-score of 0.6269 and an accuracy of 0.6357. These results indicate that both NB and SVC are highly effective in accurately classifying manifesto sentences into the designated policy areas, likely due to their ability to handle high-dimensional TF-IDF feature spaces and capture relevant patterns within the data.

In contrast, the K-Nearest Neighbors (KN) and Random Forest (RF) classifiers demonstrated lower performance, with KN achieving a weighted F1-score of 0.4332 and an accuracy of 0.4123, and RF attaining a weighted F1-score of 0.3508 and an accuracy of 0.4236. These findings suggest that distance-based and ensemble methods may be less suited to this specific text classification task, potentially due to the sparsity or high dimensionality of the TF-IDF features, which can challenge the effectiveness of these algorithms.

All Long Short-Term Memory (LSTM) network variants (LSTM_1 to LSTM_4) exhibited significantly lower performance, with weighted F1-scores ranging from 0.1913 to 0.1979 and accuracies between 0.1981 and 0.2111. This stark underperformance indicates that the LSTM models were not effective in capturing the sequential dependencies within the manifesto sentences for this classification task. Possible reasons include insufficient model complexity, inadequate training epochs, or challenges in effectively utilizing the tokenized and padded text data within the neural network architecture.

The OpenAI-based model (OpenAI_num) achieved a weighted F1-score of 0.4989 and an accuracy of 0.4804. While this performance is better than that of the K-Nearest Neighbors (KN) and Random Forest (RF) classifiers, it does not surpass the Multinomial Naive Bayes (NB) and Support Vector Classifier (SVC) models. This suggests that although the OpenAI model benefits from advanced language understanding capabilities, its performance in this specific classification task may require further optimization, such as refined prompt engineering or additional fine-tuning on the manifesto dataset.

Moreover, the traditional classifiers had the advantage of learning directly from the contextual nuances present in the dataset. For example, even though the prompt specifies that the manifestos are for the mayoral position in Brazil in 2012, certain words that are generally unrelated to a specific policy area may hold contextual relevance within the municipal framework. These classifiers, trained on the specific context of municipal governance, were able to capture and leverage these context-specific relationships effectively. In contrast, the OpenAI model, operating with a more general language understanding, may not inherently grasp these subtle contextual cues without additional contextual training or more sophisticated prompt designs. This contextual learning capability likely contributed to the superior performance of NB and SVC over the OpenAI-based model in this classification task.

VIII Description of the Policy Topics

The following word clouds (Figure D.V) offer a visual representation of the key terms in the manifestos of Brazilian mayoral candidates, classified into thematic areas based on the highest probability assigned by your algorithm. Each word cloud reflects the most frequently discussed topics within a particular category, with word size representing the frequency of the term.

- **Introduction Other Topics:** The most prominent terms here are "município" (municipality), "governo" (government), and "programa" (program), suggesting a general focus on municipal governance and proposed initiatives. Words like "todo" (whole) and "sociedade" (society) also feature, pointing to an emphasis on broad, inclusive policies.

- Urban: Terms like "manutenção" (maintenance), "município" (municipality), and "bairro" (neighborhood) dominate this word cloud, indicating a focus on urban infrastructure and neighborhood-level improvements. The prominence of "praça" (square) and "sistema" (system) points to a concern for public spaces and urban organization.
- Economics and Environment: The key terms here—"ambiente" (environment), "programa" (program), and "incentivo" (incentive)—reveal a dual focus on economic growth and environmental sustainability. Candidates emphasize the need for policies that promote economic development while also protecting the environment.
- Crime/Security: This word cloud highlights terms such as "segurança" (security), "polícia" (police), and "guarda municipal" (municipal guard), which reflect a strong focus on public safety and crime prevention. The emphasis on strengthening law enforcement and enhancing security measures is a central theme in this category.

E Extremeness and Partisanship

The methodology used to calculate extremeness and partisanship in this study is based on the approach developed by Le Pennec (2024), which builds upon the *Wordscores* method introduced by Laver et al. (2003). The *Wordscores* technique assigns scores to documents based on the frequency of words in manifestos, allowing for the positioning of each document on the political spectrum. By classifying parties as left-wing, right-wing, or center, I follow this established method to calculate partisan scores for each manifesto. These scores are then used to derive a measure of extremeness, which reflects the absolute distance from the center, and partisanship, which evaluates how closely a candidate's manifesto aligns with others from the same party.

I Extremeness Calculation

The extremeness measure is derived from the partisan scores of each manifesto. Each word w in the manifestos is assigned a score based on its frequency in left-wing and right-wing manifestos, calculated as:

$$s_w = \frac{p_w^R}{p_w^R + p_w^L} - \frac{p_w^L}{p_w^R + p_w^L}$$

A word used only by right-wing parties gets a score of 1, while a word used only by left-wing parties receives a score of -1. The overall score of a manifesto j is calculated by:

$$S_j = \frac{\sum_w p_{wj} \times s_w}{S_R}$$

Extremeness is then measured as $|S_j|$, the absolute value of this score. S_R is the score of the aggregation of all the manifestos of the right-wing group.

II Partisanship Calculation

For the partisanship calculation, I assign a unique score for each party. For each word w , the score for party t is computed as:

$$s_w = \frac{p_w^t}{p_w^t + p_w^{-t}} - \frac{p_w^{-t}}{p_w^t + p_w^{-t}}$$

Where p_w^t and p_w^{-t} are the word frequencies in the manifestos of party t and all other parties, respectively. The manifesto score for party T is then:

$$S_{j \in T} = \frac{\sum_w p_{wj} \times s_w^T}{S^T}$$

I excluded parties with less than 1.5% of the candidates to avoid distortion in the word scores.

F Populism Detection

I Dictionary

The dictionary that was used is a translation of the one described in the appendix of (Gennaro et al., 2024). I translated that dictionary into Portuguese. The dictionary they used is one of stemmed words. Thus, I had to look at all the possible words that have a similar stem.

- 'casta', 'classe', 'classes', 'elite', 'elites', 'elitista', 'elitistas', 'elitismo', 'elitização', 'elitizado', 'establishment', 'estabelecimento', 'estabelecimentos', 'corrup', 'corrupta', 'corrupto', 'corruptor', 'corruptos', 'corrupção', 'corrupções', 'corruptas', 'corruptores', 'corrupça', 'corrompe', 'regime', 'regimentais', 'regimento', 'regimentos', 'regimes', 'propaganda', 'propagandas', 'proeminente', 'proeminentes', 'arrogância', 'arrogante', 'trair', 'traição', 'trais', 'promessa', 'promessas', 'promessasmas', 'vergonha', 'vergonhosa', 'vergonhoso', 'vergonhosos', 'vergonhosamente', 'vergonhosas', 'desavergonhado', 'descarado', 'descarada', 'absurdamente', 'absurdas', 'absurdo', 'absurdos', 'absurda', 'disparatado', 'referendo', 'referendum', 'referenda', 'referendada', 'referendado', 'referendadas', 'referendados', 'referendos', 'povo', 'gente', 'povos', 'tradição', 'tradicioalista', 'tradicionalis', 'tradicional', 'tradicionalismo', 'tradicionalista', 'tradicionalistas', 'tradicionalmente', 'tradições', 'tradições', 'direta', 'políticos', 'estadista', 'governar', 'antidemocrata', 'engano', 'fraude', 'dolo'.

I also incorporated some words that were available in the dictionary described by Mendes (2021). This is a dictionary in portuguese to identify populism speeches:

- 'voz', 'verdade', 'verdadeira', 'verdadeiramente', 'verdadeiras', 'verdadeiro', 'verdadeiros', 'verdades', 'verdadeiraos', 'mentira', 'mentiras', 'oligarquia', 'oligarquias', 'clientelismo'.

II Does Populism correlates with Ideology?

In my analysis of Brazilian election manifestos, I found a weak relationship between populism and ideology, as illustrated by the scatter plot in Figure F.VI. The plot shows a slight negative correlation, where populism is marginally more prevalent in left-wing manifestos (represented by negative values on the x-axis), but overall the correlation is quite weak.

This finding is consistent with what has been observed in previous literature, such as Venturelli (2024), which also found that populism is not strongly correlated with ideological positioning in Brazil. Venturelli's study demonstrated that populism tends to be concentrated within a few political parties, particularly on the radical left, but is not widespread across the political spectrum. My results align with this, suggesting that while there is a slight tendency for populism to be more common in left-wing parties, it is not a defining characteristic of any particular ideology in Brazil.

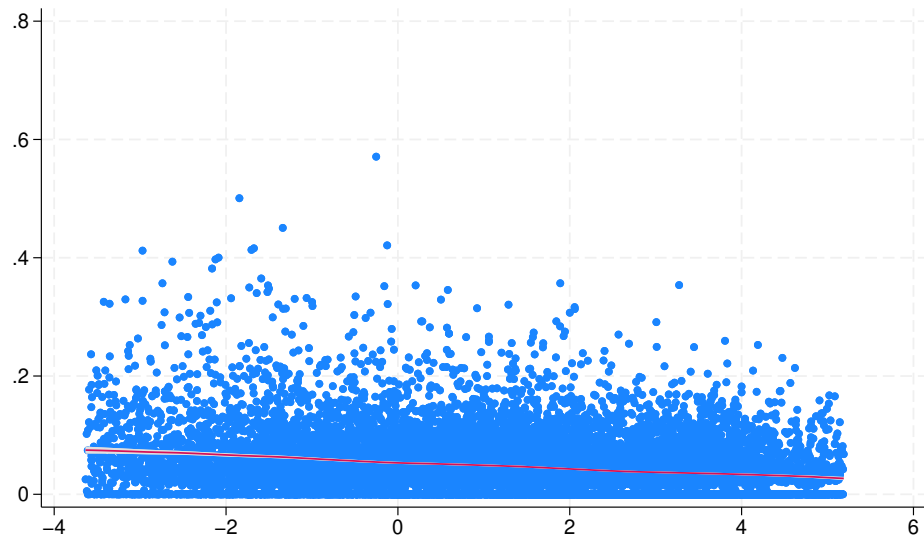


Figure F.VI: Scatter plot showing the relationship between populism scores and ideology ideology scores (computed following (Le Pennec, 2024)). Negative values on the x-axis represent left-wing ideologies, and positive values represent right-wing ideologies.

G Party Classification

I Parties

I follow the classification made by Tarouco and Madeira (2015). They surveyed Brazilian experts to get the ideological positioning of the parties. They do not classify parties as left, right or center. I decided to group all parties between 1 and 4 as left-wing, and all parties between 5 and 7 as right. The remaining are classified as center parties.

Table G.XI: Parties in the 2012 Election and How They Are Labeled to Measure Extremeness

| Left | Center | Right |
|-------|--------|---------------|
| PCO | MDB | PTB |
| PSTU | Avante | SDD |
| PSOL | PMN | Podemos |
| PCB | PHS | PRTB |
| PCdoB | PSDB | PRB |
| PT | PSD* | PTC |
| PSB | | PRP |
| PDT | | PR |
| PV | | PSL |
| PPS | | PSC |
| UP* | | DC |
| PPL* | | Progre DEM |

^a **Notes:** This table shows the distribution of parties in the left, center, and right-wing groups following Tarouco and Madeira (2015). They are ordered from left (above) to right (below).

* Parties classified using Bolognesi, Ribeiro, and Codato (2022).

H Effect of Exposing High-Corruption in Neighboring Municipalities

In this section, I examine the effects of exposing corruption in neighboring municipalities on the political rhetoric of opposition and incumbent candidates. Specifically, I estimate the impact of exposure to both high- and low-corruption in neighboring municipalities on two dependent variables: populism and extremeness in the political manifestos of candidates. The analysis distinguishes between opposition candidates and incumbents. Figure H.VII and Figure H.VIII show the neighboring municipalities to the audited ones before and after the election respectively.

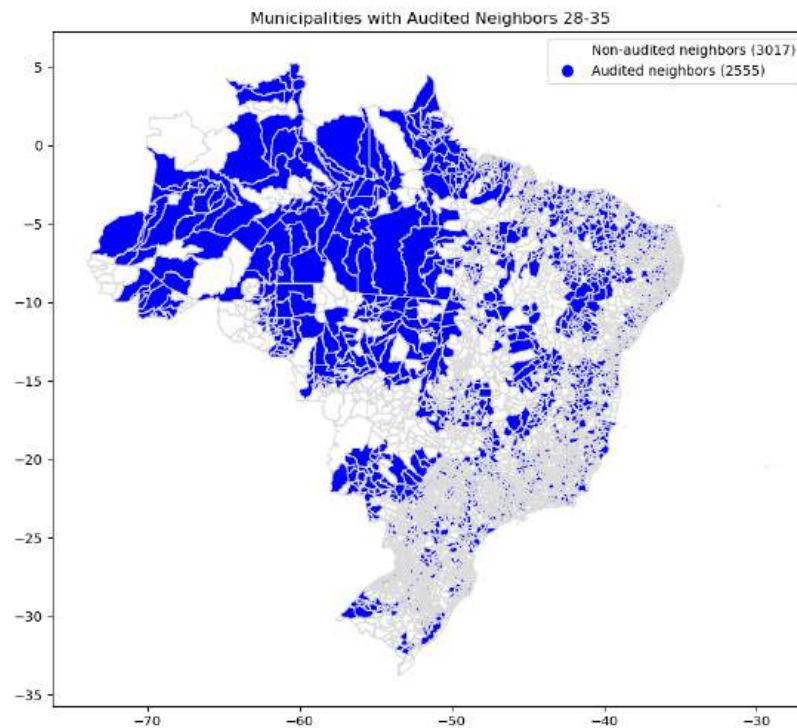


Figure H.VII: Audited Municipalities and their neighbors in round 28 to 35

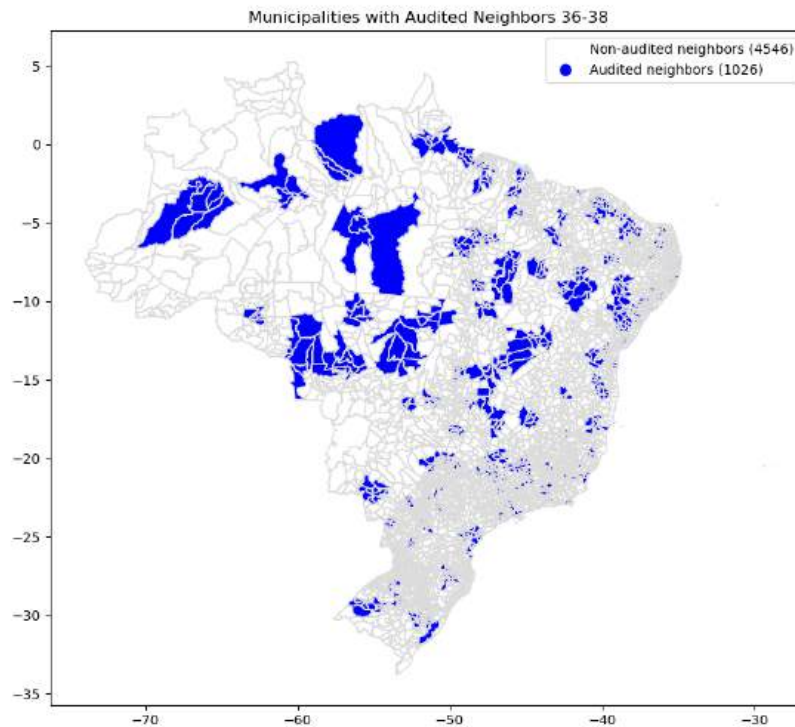


Figure H.VIII: Audited Municipalities and their neighbors in round 36 to 38

The results reveal no significant effects of neighboring corruption exposure, either high or low, on populism or extremeness, for both opposition and incumbent candidates. As shown in Figure H.IX, the coefficients for exposure of corruption in neighboring municipalities are small and statistically insignificant.

These results suggest that candidates' rhetorical adjustments are largely confined to municipalities directly affected by corruption scandals rather than a broader response to regional exposure. Notably, opposition candidates only appear to react when incumbents in their municipality are directly exposed, indicating that the effect is driven by electoral concerns, rather than societal outrage at the scandal. This reinforces the hypothesis that politicians strategically adjust their rhetoric in response to local electoral incentives, rather than broader, region-wide reactions to corruption scandals.

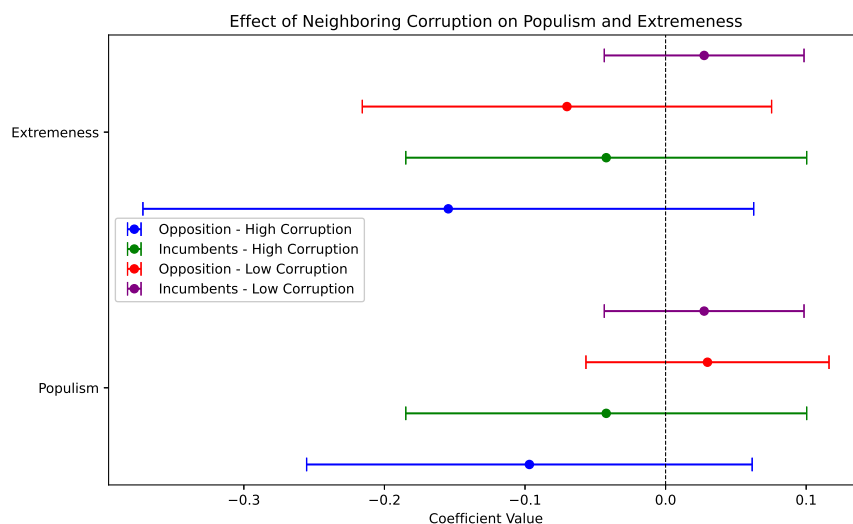


Figure H.IX: Effect of Neighboring Corruption on Populism and Extremeness

Note: This figure shows the coefficients for the effect of neighboring corruption exposure (both high and low) on populism and extremeness for opposition and incumbent candidates. The coefficients and 95% confidence intervals are displayed. Blue dots represent opposition candidates in high-corruption municipalities, green dots represent incumbents in high-corruption municipalities, red dots represent opposition candidates in low-corruption municipalities, and purple dots represent incumbents in low-corruption municipalities. The vertical line at 0 represents no effect. The sample sizes for the regressions are 1,436 for opposition (both for Populism and Extremeness), and 803 and 815 for incumbents when analyzing Populism and Extremeness respectively.

I The Role of Candidate Profession in Health-Related Discussions

I further investigate whether the observed focus on health-related corruption cases is driven by the professional background of candidates, specifically whether they are health professionals or medical doctors. I run two separate regressions with the dependent variables indicating if the candidate is a health professional or a medical doctor, respectively. The key independent variable remains the share of corruption cases in the health sector and whether the audit results were exposed before or after the election.

The coefficient plot in Figure I.X compares municipalities with high and low shares of health corruption cases, with results for candidates who are health professionals and those who are medical doctors. In both cases, the null hypothesis cannot be rejected, indicating that the likelihood of a candidate being a health professional or a medical doctor is not significantly related to the exposure of a high share of health corruption cases in the municipality.

This finding suggests that the increased focus on health issues in municipalities with high levels of health-related corruption is not driven by the candidates' professional background but rather by the salience of health-related corruption in these contexts. The results are consistent across both health professionals and medical doctors, further supporting the conclusion that the focus on health is a strategic political decision rather than being tied to candidates' expertise.

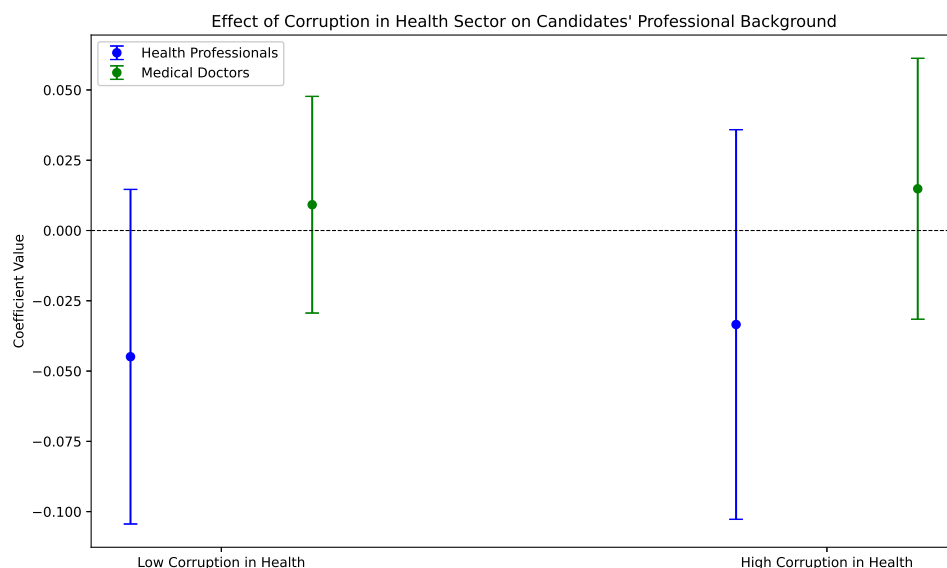


Figure I.X: Effect of Corruption in Health Sector on Candidates' Professional Background
Note: This figure compares the coefficients and 95% confidence intervals for the likelihood of candidates being health professionals or medical doctors. The analysis examines municipalities with high and low shares of health-related corruption, with results exposed before the election vs. after the elections. Blue dots represent the results for all health professionals, and green dots represent the results for medical doctors. The vertical line at 0 represents no effect.