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Fixed-term contracts and re-election of mayors: is it worth making the exception the rule?

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Abstract

Objective: To analyze the extent to which personnel expenses incurred through temporary contracts are associated with the chances of re-election of Brazilian mayors.
Method: Logistic regression was used to identify the presence of opportunistic political cycles. The analysis period was from 2013 to 2020, covering two municipal election cycles in Brazil (2013-2016 and 2017-2020).
Results or Discussion: The results indicate that municipalities with higher percentages of fixed-term contracts have a higher estimated probability of mayoral reelection. In addition, belonging to the governor's party or the president's party is associated with a higher probability of mayoral reelection. The results are consistent with the hypothesis of opportunistic behavior, in that greater use of temporary contracts correlates with better electoral performance in election years.
Contributions: It contributes to the deepening of discussions on opportunistic political cycles by revealing patterns and strategies associated with the electoral process used by managers to influence elections. In addition, it provides empirical evidence that can guide control bodies in creating mechanisms to detect and prevent opportunistic practices, such as temporary hiring for electoral purposes.

Keywords: Political cycles; Fixed-term contracts; Municipal reelection; Brazilian municipalities.

How to Cite:

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Introduction

Downs' Theory of Political Cycles (1957) points out that public managers do not adopt economic policies aimed exclusively at social welfare, but that, linked to the social function, there is also the particular interest of remaining in power on the part of the public manager (Dias et al., 2018).

Research points to a reality in which the presence of political cycles has been more pronounced in developing countries and tends to be rewarded rather than punished (Lewis et al., 2020). This phenomenon is often attributed to a number of complex factors that permeate the political and socioeconomic dynamics of these growing nations. Among these factors, issues such as the socioeconomic vulnerability of the population (Bezerra Filho & Gondinho, 2021; Lewis et al., 2020), the lack of consolidated institutions (Morais et al., 2019; Morais, 2016), and the influence of private interests on the political process (Santos, 2020).

This theory takes into account the fact that economic policy decisions, adopted by public managers, are influenced by personal issues that directly involve the quest for permanence in power and compromise the efficiency of management in the application of public policies (Puchale, 2019).

For example, the main way to enter public service is through a competitive examination. However, some exceptions are allowed, including fixed-term contracts. In municipalities, exceptions to this rule have become increasingly frequent, establishing a legal way to circumvent legislation and favor political patronage (Rodrigues & Vilas Boas, 2019).

Although there are studies that point out the factors that influence the reelection of political managers (Bezerra Filho & Gondinho, 2021; Lewis et al., 2020), few studies address the personnel expenses of these managers, hired on a fixed-term basis, and their influence on the reelection of mayors.

Among municipal expenditures, personnel expenses absorb the largest share of budgetary resources (Morais et al., 2019). For Bandeira, Britto, and Serrano (2018), personnel expenses and the resulting charges are responsible for the growth of ongoing public expenditures.

A crucial aspect that demands attention in monitoring personnel-related expenses is the complex composition of the civil service payroll. Not limited to statutory career civil servants (permanent employees), it also includes the allocation of positions of trust (commissioned employees) and a significant proportion of temporary contracts.

This diversification, although it may be justified in certain circumstances, raises pertinent questions about the effectiveness, necessity, and transparency of these hires. Such questions not only highlight the importance of careful analysis, but also underscore the urgency of measures to ensure integrity and efficiency in the management of public resources allocated to labor (Rodrigues & Vilas Boas, 2019).

According to Lima et al. (2024), the Fiscal Responsibility Law establishes explicit limits on personnel expenses as central mechanisms for controlling public spending. These authors highlight that debt and personnel expenditure limits are key features of the FRL for controlling public spending, highlighting the relevance of this fiscal control. In other words, compliance with legal limits on personnel expenses is essential to maintain fiscal balance and avoid imbalances in public accounts in Brazil. It is worth noting that opportunistic practices in public management in underdeveloped countries, such as Brazil, are recurrent; Bezerra Filho and Gondinho (2021) related the probability of mayors' reelection to school meal management. They found a directly proportional relationship between students' access to school meals and the victory of the candidate in the region's election.

Morais (2019) identified evidence of political-budgetary cycles that manifest themselves in increases in personnel expenses in election years. Similarly, Rodrigues and Rodrigues (2019) found that increased spending on temporary hires (individuals) in pre-election periods increases the chances of reelection for public officials. These studies corroborate the hypothesis that mayors rapidly expand the administrative apparatus before elections to win votes.

In contrast, França (2019) focused on 194 municipalities in Maranhão (up to 50,000 inhabitants) in the period 2004–2017, analyzing exclusively temporary personnel expenses. In this study, temporary hiring was treated as a dependent variable and reelection as an explanatory variable, showing that in election years there is a significant increase in spending on temporary contracts. However, the author's approach was essentially descriptive and restricted to a single state, without directly assessing the impact of these expenditures on the probability of reelection. In addition, the study noted that some municipalities did not provide complete data, pointing to limitations in the scope of the sample.

This study filled this methodological gap, expanding the scope to the entire national territory and reversing the explanatory logic. Unlike França (2019), who investigated the effect of reelection on spending, we sought to assess the extent to which temporary personnel expenditures are associated with the chances of mayors being reelected. To this end, we used logistic regression considering only incumbent mayors running for reelection (as predicted by political cycle theory). In addition to temporary expenditures, we incorporated additional controls—the party of the state governor and the president of the Republic, investments in public works, and constitutional transfers received—in order to isolate the electoral impact of temporary hiring.

Given the scenario described above, this study aimed to analyze the extent to which personnel expenditures, made through temporary contracts, are associated with the chances of reelection for Brazilian mayors.

This research is justified by the need to understand the political and electoral effects of personnel expenses, especially those incurred through temporary contracts, in the context of Brazilian municipal public administration. The investigation gains relevance when considering the legal restrictions imposed by electoral legislation on the last two quarters of the election year, a period in which such hiring is prohibited, except in cases where there are proven essentiality and urgency of public service.

The investigation used Political Cycle Theory as its theoretical framework, and its empirical object comprised cases of reelection of mayors affiliated with the same party as the Governor and the President of the Republic.

The research data were estimated by logistic regression, chosen because it is more appropriate for estimating the relationship between a binary dependent variable and independent variables. The period studied was from 2013 to 2020, because it allowed us to work with two complete cycles of municipal elections in Brazil - 2013-2016 and 2017-2020. This time frame was essential to capture variations in spending patterns and electoral dynamics over two consecutive terms.

Unlike approaches based on the premise of opportunistic behavior by government officials, this study adopts an analytical perspective, carefully examining whether temporary hiring patterns are associated with electoral results. In this sense, it deepens the theory of political cycles by considering fixed-term contracts as a variable of interest in the literature on political science and public administration. This broadens the understanding of how specific administrative decisions—in particular the composition of the payroll—can reflect or influence electoral dynamics, without assuming such a relationship as a given.

Empirically, the study offers a robust contribution through an unprecedented quantitative analysis on a national scale. The use of logistic regression on a panel of data from Brazilian municipalities (2013–2020) allows for the identification of relevant statistical evidence.

The results show that, controlling for contextual and institutional factors, municipalities with higher percentages of temporarily hired civil servants have different chances of reelection. In addition, the model incorporates political alignment variables (such as belonging to the same party as the state governor or the president of the Republic), revealing that such party alliances are also associated with the probabilities of electoral victory. These empirical findings, presented with methodological rigor, enrich the academic debate by highlighting consistent correlations between patterns of temporary hiring and electoral performance.

Finally, the research offers empirical findings that can support internal, external, and social control and oversight bodies in creating effective mechanisms to detect and/or prevent opportunistic practices in public management, especially with regard to the deliberate use of fixed-term temporary contracts.

2 Theoretical Reference

2.1 Political Cycle Theory

Political Cycle Theory seeks to understand how government officials adjust their economic policies and administrative decisions according to the electoral calendar, particularly with the aim of maximizing votes and increasing their chances of remaining in power. This theory is composed of different schools of thought, among which the classical and rational schools stand out, each with its own subdivisions.

The classical school can be divided into two main branches: the opportunistic branch, which assumes that politicians act solely to remain in power, regardless of ideology, and the partisan branch, which considers that parties adjust public policies according to their ideological orientations, even though they also have an interest in remaining in government (Alesina et al., 1992; Drazen & Eslava, 2010). This study is anchored in the classical opportunistic strand, which assumes that government officials manipulate economic and budgetary variables—such as public spending on temporary staff hiring—to create a positive image of their administration and thus increase their chances of reelection.

Downs (1957) was one of the first authors to suggest that political parties in democratic regimes are driven by the logic of maximizing votes. For him, political decisions are often influenced by biased information and electoral interests. The proposal was expanded by Nordhaus (1975), who presented the first formal model of the Theory of Opportunistic Political Cycles. In his approach, public managers, attentive to the electoral cycle, manipulate economic variables—such as inflation and unemployment—by exploiting the trade-off estimated by the Phillips Curve. The central idea is that by accepting a controlled increase in inflation in the short term, governments could reduce unemployment in the pre-election period, creating a perception of economic improvement and thus positively influencing voter behavior.

Complementing this approach, Rogoff (1990) and Rogoff and Sibert (1988) developed models in which voters have imperfect information about the government's competence, which opens the door for politicians to manipulate visible fiscal or economic indicators, such as public spending and hiring, for electoral purposes. In this sense, Brender and Drazen (2005) identified that, especially in emerging democracies, such manipulations tend to be rewarded by voters, which reinforces the opportunistic behavior of managers.

More recent studies corroborate these conclusions. Lewis et al. (2020) found that, in recent democracies, the practice of increasing public spending during election periods tends to be rewarded, not punished. Sidorkin and Vorobyev (2018), in turn, found that fiscal policy and public spending cycles are more evident in developing countries, where voters often reward this type of behavior.

In the Brazilian context, Santos et al. (2021) found evidence of increased spending in areas sensitive to the population, such as education, health, and investments, in election years in municipalities in Minas Gerais. Bartoluzzio and Anjos (2020) reinforce this finding by arguing that increased investments with strong visual appeal or a direct impact on citizens' daily lives tend to significantly influence election results. At the international level, Maličká and Mourão (2023) also observed, even in developed countries, an increase in municipal revenue and expenditure during election periods. Cahan (2019), when analyzing the public sector in the US, identified that public employment behavior changes in gubernatorial election years, revealing the existence of political cycles in this context.

Thus, the literature shows that political cycles reflect opportunistic behavior by public managers who manipulate fiscal, economic, and administrative variables in order to prolong their stay in power (Machado et al., 2022). This set of practices includes, for example, the intensification of temporary hiring in the pre-election period, which is the specific focus of this research.

2.2 Temporary Hiring and Prohibitions at the End of Terms

Marconato et al. (2021) demonstrate that an increase in the payroll, whether due to salary adjustments or unplanned hiring, directly compromises the balance of municipal accounts, affecting fiscal results, compliance with legal limits on personnel expenses, and, consequently, fiscal management. In the public sector, this effect is even more relevant, as personnel expenses represent the most significant portion of the public budget, since governments act predominantly as providers of essential services to the population.

In the context of Political Cycle Theory, it is observed that public managers tend to adopt opportunistic behaviors at the end of their terms, such as increasing temporary hiring for electoral or political favoritism purposes (Rogoff, 1990; Shi & Svensson, 2006). These actions, although often cloaked in legality, compromise fiscal sustainability and the efficiency of public management, especially in municipalities with less technical and budgetary capacity.

In order to have greater control over personnel expenses, Complementary Law No. 101 was created in 2000 - Fiscal Responsibility Law (FRL) - was created in 2000, establishing rules for fiscal management responsibility (Bandeira et al., 2018): planning, transparency of government actions, and balancing public accounts (Morais et al., 2019; Miranda et al., 2022).

The FRL, in its Article 21, sole paragraph, expressly prohibits increases in personnel expenses during the final 180 days of a term of office. This prohibition seeks to mitigate the risk of expanding personnel expenses at the end of the term for reasons that are not fully justified from a fiscal and administrative point of view, reinforcing discipline, continuity, and responsibility in fiscal management (Brazil, 2000; Morais et al., 2019; Miranda et al., 2022). Empirically, the literature suggests that atypical movements during this period may be compatible with electoral incentives in certain contexts, but may also reflect legitimate service needs, which is why interpretation should be done with caution (Morais et al., 2019; Veiga & Veiga, 2007; Brollo et al., 2013).

Morais et al. (2019) identified that, even with the FRL in force, political-budgetary cycles influence personnel expenditure. Santos (2020) found that mayors seeking reelection spend more in the periods leading up to municipal elections as a strategy to secure reappointment to office.

Empirical studies confirm that there is a higher incidence of hiring and increased personnel spending in election years, especially in the second half of the year, which highlights practices aligned with the theoretical model of political budget cycles (Veiga & Veiga, 2007; Brollo et al., 2013).

2.3 Construction of the Research Hypothesis

The Federal Constitution of 1988 establishes public competitive examinations as the legitimate means of entering public service and allows temporary hiring only in situations of exceptional public interest (Brazil, 1988). However, studies indicate that this mechanism has been widely used, ceasing to be characterized as an exception and becoming a recurring practice in Brazilian public administration (Silva & Gurgel, 2024).

Rodrigues and Vilas Boas (2019) questioned the reasons that would justify the frequent use of fixed-term contracts in Brazilian municipalities. Among the reasons pointed out, political favoritism towards close associates or voters stands out, constituting the practice of political patronage. Feldman and Gouveia (2022), in a study in the state of Pará, found that the policy of hiring temporary teachers, especially in rural areas, exerts political influence in municipal election disputes.

These temporary contracts can take on a politically instrumental role in certain contexts, especially when there are greater discretion and less control and transparency. In such cases, the literature points to the risk of a departure from strictly administrative purposes and an association with practices of political favoritism and patronage (Rodrigues & Vilas Boas, 2019; Feldman & Gouveia, 2022; França, 2019), which makes it plausible to investigate whether there are aggregate patterns compatible with electoral incentives, without this implying direct intentionality on the part of the manager.

The context described above led to the following hypothesis being tested:

H1: Increased spending on temporary staff in pre-election periods increases the incidence of mayors being re-elected.

The hypothesis is based on the premise that the use of temporary contracts for hiring personnel is a recurring practice adopted by mayors as a strategy to secure electoral support and, consequently, increase their chances of reelection.

3 Research Methodology

In order to investigate the extent to which personnel expenses incurred through temporary contracts are associated with the chances of reelection of Brazilian mayors, a quantitative and descriptive approach was adopted, based on secondary data and with a longitudinal cross-section.

The research covered the period from 2013 to 2020, encompassing two complete electoral cycles, originating from the 2012 and 2016 municipal elections. This interval was considered adequate to observe the reelection intentions of mayors and identify variations in spending on fixed-term contracts over time.

The sample included all Brazilian municipalities that reported temporary contract expenses to SICONFI between 2013 and 2020. In total, 43,444 observations were collected for the variables analyzed, of which 27,454 were validated for the final results. The absence of data for the explanatory variable "fixed-term contracts" resulted in the exclusion of 15,990 observations.

The information used was obtained from official databases, as described below, and systematized in Box 1:

1. Dependent variable: The reelection of municipal mayors was operationalized as a dummy variable, assuming a value of 1 when the mayor was reelected and 0 when he or she was unsuccessful in the subsequent election (Morais et al., 2019; Dias et al., 2018; Bezerra Filho & Gondinho, 2021). The identification of elected or reelected candidates was based on data from the Superior Electoral Court (TSE, 2023).

2. Main explanatory variable: The central indicator of the research corresponds to the percentage between expenditures on temporary hires for a fixed term ( ) and total personnel expenditures between 2013 and 2020 (França, 2019). The data were extracted from the Budget Expenditure Reports (Annex I-D), available in the Brazilian Public Sector Accounting and Tax Information System (SICONFI, 2023), focusing on committed and settled amounts.

The use of committed and settled amounts, rather than committed amounts alone, is justified because only settlement, under the terms of Article 63 of Law No. 4,320/1964 (Brazil, 1964), proves the effective provision of the service and consolidates the creditor's right to receive payment.

3. Political party alignment: The variables Mayor's Party equal to Governor's Party and Mayor's Party equal to President's Party were extracted from the TSE (2023). Studies indicate that alignment with higher levels of power can favor access to resources and, consequently, increase the chances of reelection (Bezerra Filho & Gondinho, 2021; Almeida & Saiani, 2021). Political alignment tends to facilitate the obtaining of additional budget transfers and institutional support, which can be perceived by the electorate as a sign of administrative capacity and stability.

4. Population size: The variable referring to population size was included as a control variable, given its relevance in explaining political and administrative dynamics in municipal contexts. In countries such as Brazil, with more than 5,600 municipalities spread across a territory of continental dimensions, population heterogeneity can significantly influence the governance structure, voter behavior, and the probability of reelection. Studies such as those by Samuels (2004) and Pereira and Rennó (2011) indicate that mayors of municipalities with larger populations face more complex administrative challenges, greater social oversight, and less proximity to voters, factors that can reduce their chances of reelection. Population data were obtained from the Brazilian Institute of Geography and Statistics (IBGE, 2023).

5. Economic indicators: The Gross Domestic Product (GDP) of the municipalities, obtained from IBGE (2023), and spending on public works, reported by STN, were included as proxies for economic development and investment in infrastructure. Bartoluzzio and Anjos (2020) highlight that these expenditures, especially in pre-election years, have a strong appeal to the population and can impact electoral performance. However, Santos (2020) identified that local GDP growth does not always translate into a higher probability of reelection and may even have the opposite effect.

6. Intergovernmental transfers: The variables Resources Transferred by the Union and by the States were collected from the STN database. The literature (Machado et al., 2022; Bezerra Filho & Gondinho, 2021) points out that party alignment between mayors and higher levels of the executive branch favors the obtaining of resources and access to federal programs, positively impacting electoral performance, especially when the benefits are visible to the population.

7. Gini index: Finally, the variable representing the degree of municipal income concentration was included based on the Gini index (IBGE, 2023). The index ranges from 0 (total equality) to 1 (maximum inequality), according to Leite (2018). Almeida and Saiani (2021) suggest that mayors of municipalities with higher levels of inequality face greater difficulties in obtaining reelection.

To test the hypothesis, a linear probability model was estimated using the Ordinary Least Squares (OLS) method, and then the results were estimated using logistic regression (Dias et al., 2018; Santos, 2020). The estimation was performed using STATA 17 software (StataCorp, 2023).

$$Reeleição_{it} = \beta_0 + \beta_1 Contrato + \beta_2 Partgov_{it} + \beta_3 Partpres_{it} + \beta_4 PIBpc_{it} + \beta_5 Obras_{it} + \beta_6 Pop_{it} + \beta_7 Transuni_{it} + \beta_8 Transest_{it} + \beta_9 GINI_{it} + a_i + \varepsilon_{it}$$

$$Reeleição_{it} = \begin{cases} 0, se Reeileição_{it} < 0 \\ 1, se Reeileição_{it} \geq 0 \end{cases}$$

Where i is the index for Brazilian municipalities, and t is the time period (2013 to 2020). Reelectionit was a binary variable with a value of one (1) if the mayor of municipality i was reelected in political cycle t, and zero (0) otherwise—a_i is the term that represents the unobserved characteristics of municipalities that do not vary over time. ε_{it} is the random error term of the regression ε_{it} N(0,Σ).

Although the term "political cycle" can be interpreted as covering the entire term of office, the literature indicates that strategic fiscal effects tend to intensify in election years. França (2019) identifies a significant increase in spending on temporary hires during this period, and Bartoluzzio and Anjos (2020) point out that mayors intensify actions precisely in election years. Thus, the proposed model focuses on the last year of the term, when

Box 1. Variables used in the research and their respective sources

Variables	Description	Classification	Data Source	Expected Relationship	Literature
Re-elected	Dummy variable to identify whether the mayor was successful in his reelection bid or not	Dependent	TSE	-	Morais et al. (2019); Dias et al. (2018).
Contract	Percentage of expenses with fixed-term contracts and total personnel expenses	Explanatory	National Treasury - SICONFI	Positive	France (2019)
Part_gov	Mayor's party same as governor's party	Control	TSE	Positive	Almeida and Saiani (2021) Bezerra Filho and Gondinho (2021)
Part_pres	Mayor's party same as president's party	Control	TSE	Positive	Dias et al. (2018); Almeida and Saiani (2021))
Pop	Population size	Control	IBGE	Positive	Dias et al. (2018); Almeida and Saiani (2021)
GDPpc	Municipal GDP given in per capita values	Control	IBGE	Negative	Samuels (2004) and Pereira and Rennó (2011)
Public works	Per capita spending on public works	Control	National Treasury – SICONFI	Positive	Santos (2020)
Transf_uni	Per capita amount of funds transferred by the federal government	Control	National Treasury – SICONFI	Positive	Bartoluzzio and Anjos (2020)
Transf_est	Per capita amount of funds transferred by states	Control	National Treasury – SICONFI	Positive	Machado et al. (2022),
GINI	Gini Index	Control	IBGE	Negative	Almeida and Saiani (2021).

Source: Prepared by the authors

such expenditures have the greatest potential to influence the election result and the probability of reelection.

4 Results and Discussions

4.1 Descriptive Statistics

Table 1 shows the results of the descriptive statistics. On average, 15.67% (S.D. = 36.35%) of the mayors in the sample were reelected during the period of this research. Santos (2020) pointed out that, on average, 26% of candidates were reelected in the state of Pará. The results of Dias et al. (2018) show that, on average, 57% of candidates were re-elected to the position of mayor during the period analyzed in the municipalities of Espírito Santo. The explanatory variable of the study—spending on fixed-term temporary contracts in relation to total municipal personnel expenses—represented, on average, 12.90% of spending in the pre-election periods. The standard deviation was 11%, meaning that actual spending could consume up to 23% of total personnel expenses.

The average reelection rate of 15.67% is substantially lower than the percentages identified by Santos (2020) and Dias et al. (2018), suggesting possible important regional or contextual variations that deserve further investigation. The average of 12.90% of spending on temporary hires, with a standard deviation of 11%, shows significant heterogeneity among municipalities, which reinforces the importance of additional controls in the econometric model. These descriptive data contribute to contextualizing the phenomenon studied and anticipate possible associations to be explored in subsequent analyses.

Table 1. Descriptive statistics of mayors reelected in the 2013-2020 period

Variables	Mean	Standard Deviation S.D.	Cv	Min	p25	p50	p75	max	N
Re-elected	0.156771	0.363592	2.319248	0	0	0	0	1	27454
Contract	0.129093	0.113314	0.877771	3.35E-09	0.035581	0.105062	0.194684	0.888037	27454
Part_gov	0.18012	0.384294	2.13355	0	0	0	0	1	27454
Part_pres	0.07427	0.262214	3.530566	0	0	0	0	1	27,454
GDPpc	28,993.93	31,452.31	1.08479	5105.144	12,565.27	19,522.02	34,731.44	1045114	27454
Construction	191,403	260,7548	1,362,334	1.63E-06	55.41652	117.2147	230.0557	7689.959	27454
Pop	41983.77	234,587.6	5.58758	781	6255	13,259.5	27834	1.23e+07	27454
Trans_uni	2320.176	1493.279	0.643606	68.77152	1424.53	1,899,024	2,737,005	41135.43	27454
Trans_est	984.7123	984.6178	0.999904	1.171438	382.2638	697.6402	1,239.778	20,615.67	27454
GINI	0.502102	0.064423	0.128307	0.28	0.46	0.5	0.54	0.8	27454

Source: Prepared by the authors.

4.2 Model Selection

The model was estimated using the Ordinary Least Squares (OLS) method. To verify the presence of multicollinearity among the explanatory variables, the Variance Inflation Factor (VIF) test was performed, whose results were below the reference value of 10, indicating the absence of significant multicollinearity in the model (see Table 2), as recommended by Hair et al. (2009).

Table 2. Variance Inflation Factor test results

Variables	VIF
logTrans_est	3.96
logObras	1.11
logGDP	3.77
Logpop	2.81
logtrans_uni	2.65
GINI	1.23
Contract	1.07
Partpres	1.04
Partgov	1.04
FIV Average	2.08

Source: Prepared by the authors.

The Breusch-Pagan heteroscedasticity test indicated rejection of the null hypothesis of constant variance of errors, suggesting the presence of heteroscedasticity in the data. Given this diagnosis, the subsequent models (LOG1 and LOG2) were estimated with robust correction for heteroscedasticity in order to ensure the validity of the statistical inferences (Gujarati & Porter, 2011).

The results of the Logit model estimates are presented in columns (2) and (3) of Table 3. Column (2) shows the estimated coefficients of the Logit model with the inclusion of control variables. In column (3), in addition to the control variables, fixed effects of time and federal unit were incorporated in order to capture unobserved variations associated with factors specific to each year and each municipality.

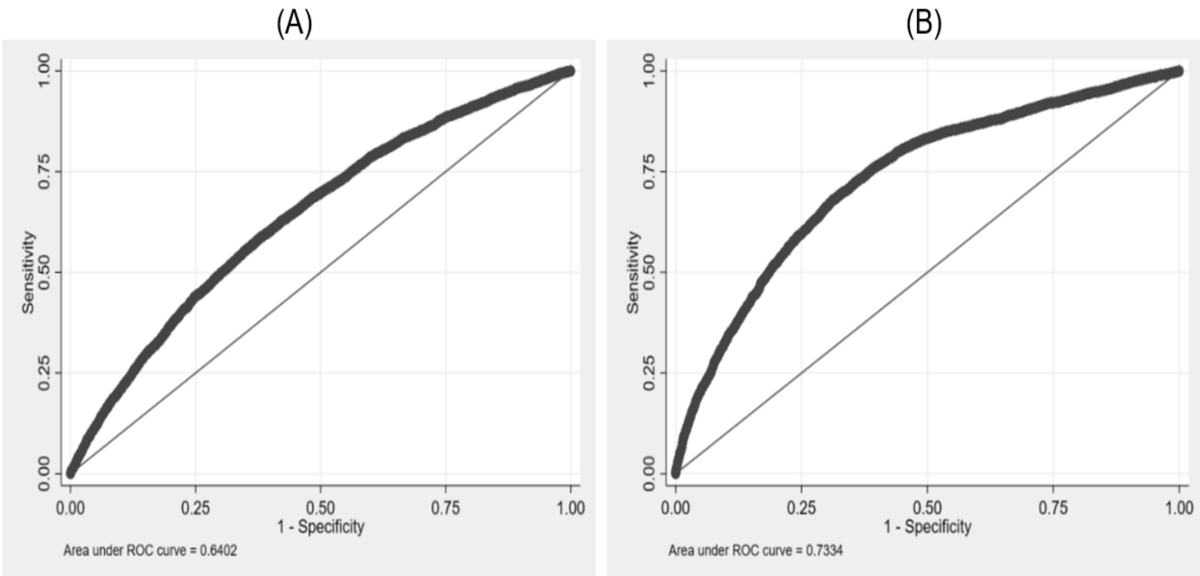
Table 3. Results of the estimation of the linear probability model and the Logit model for the period from 2013 to 2020

	Dependent variable: dummy=1 if there was reelection		
	(1)	(2)	(3)
	MQO	LOG1	LOG2
Contract	0.0628	0.4467***	0.3984**
	(0.02)	(0.15)	(0.19)
Part_gov	0.0493***	0.3591	0.2790
	(0.01)	(0.04)	(0.04)
Part_pres	0.0235	0.1732	0.5405
	(0.01)	(0.06)	(0.07)
logGDP	0.0182***	0.0947**	-0.0015
	(0.01)	(0.05)	(0.05)
logWorks	0.0230	0.1923	0.3213
	(0.00)	(0.02)	(0.02)
logPop	0.0427***	0.3051	0.1508
	(0.00)	(0.02)	(0.03)
logTrans_uni	0.1347***	0.9338	0.1930
	(0.01)	(0.05)	(0.07)
logTrans_est	-0.0099*	-0.0548	0.0578
	(0.01)	(0.04)	(0.05)
GINI	-0.1068***	-0.9777***	-1.3198***
	(0.04)	(0.30)	(0.36)
_cons	-1.4663***	-12.9122***	-7.1343***
	(0.08)	(0.55)	(0.80)
No. of Obs.	27,454	27454	27454
Pseudo R2	-	0.03	0.10
FIV mean(i)	2.08	-	-
Breusch-Pagan(ii)	1443.40	-	-
AIC(iii)	21495.9	23,025.4	21,383.2
BIC(iv)	21,578.1	23,107.6	21,728.5
E.F. Time(v)	No	No	Yes
E.F. Status(vi)	No	No	Yes

Note: [i] FIV - Variance Inflation Factor; [ii] Breusch-Pagan heteroscedasticity test; [iii] AIC - Akaike model selection criterion; [iv] BIC - Schwarz's model selection criterion; [v] E. F. Time - vector of dummy variables representing each year of the period from 2013 to 2020, assuming a value of 1 for the respective year and 0 otherwise; [vi] E. F. State - vector of dummy variables representing the state of the i-th municipality. Assumes a value of one (1) if the municipality belongs to state j and zero (0) otherwise. j represents the Brazilian states; [vii] Standard error in parentheses; [viii] *p<0.10, **p<0.05, ***p<0.01.
Source: Prepared by the authors.

To choose the most appropriate model for analyzing the results, we used the Akaike (AIC) and Schwarz (BIC) information criteria, which indicate a better fit when their values are lower. The LOG2 model had the lowest AIC and BIC values and was therefore the most appropriate among those estimated. This result is reinforced by the Pseudo-R2 value, which was also higher in the LOG2 model, an additional criterion used in the literature to evaluate the performance of Logit models (Wooldridge, 2010). Figure 1 shows the predictive capacity of the econometric model using the Receiver Operating Characteristic (ROC) curve, which illustrates its ability to correctly discriminate between the categories of the dependent variable.

Figure 1. ROC curve of the LOG1 and LOG 2



Source: Prepared by the authors

According to Hosmer and Lemeshow (1989), the area under the ROC curve must be greater than 0.5 for the model to show discriminatory capacity between the categories of the dependent variable. Results lower than or equal to this value indicate a lack of predictive power. In the present study, it was observed that both the LOG1 model, panel (A), and the LOG2 model, panel (B), performed satisfactorily, with areas under the curve of 0.64 and 0.73, respectively. These results indicate that both models are capable of discriminating the categories of the dependent variable in an acceptable manner, with LOG2, with fixed effects, being the most appropriate, as it presents greater predictive efficiency and better overall performance.

4.3 Analysis and Discussion of Results

The analysis of the results presented in Column (3) of Table 3 reveals that municipalities with a higher percentage of fixed-term contracts have a higher estimated probability of re-election of the mayor. The coefficient of the Contract variable was positive and statistically significant at the 5% level. Thus, the H1 hypothesis of this research, understood as the expectation that higher spending on temporary staff in a pre-election context is associated with a greater chance of reelection, is not rejected.

This result is consistent with the literature on opportunistic political cycles (Nordhaus, 1975), suggesting that, especially in election years, the increase in this type of spending may be related to political incentives faced by incumbents. However, it is important to note that the findings are obtained from aggregate statistical patterns and do not allow us to infer the individual intentions of managers. In this sense, discussions about possible mechanisms should be interpreted as plausible hypotheses, anchored in the literature. For example, studies such as Rodrigues and Vilas Boas (2019) argue that temporary hiring may, in certain contexts, be related to practices of political favoritism and patronage, which could help interpret the observed association.

The results found are in line with Feldman and Gouveia (2022), who observed similar behavior in the state of Pará, where the hiring of temporary teachers is associated with electoral performance. Similarly, Morais et al. (2019) demonstrated that, even in the face of restrictions imposed by the Fiscal Responsibility Law, managers continue to use these expenditures as a form of potential electoral incentives. França (2019), in turn, also found statistical significance in the increase in temporary hires in contexts of reelection campaigns, reinforcing the thesis of the instrumentalization of these ties as part of local political cycles.

In addition, it should be noted that this practice tends to be exploited because it is easy to manage within the legal limits of personnel expenses and because of the political and electoral returns it provides. By avoiding public competitions and systematically resorting to temporary contracts, mayors create dependency and expectations of continuity among contractors, which can directly influence the electoral behavior of these individuals and their families. Furthermore, the precarious employment status of these workers may inhibit criticism or demands, intensifying the opportunistic use of this type of hiring.

Among the control variables, Part_gov and Part_pres stand out, presenting statistically significant coefficients. The results indicate that mayors who are politically aligned with the governor or the president of the Republic have a greater chance of reelection. This finding is in line with the findings of Almeida and Saiani (2021), who point out that political-party alignment increases the chances of remaining in office, due to easier access to budgetary resources and the possibility of exchanging electoral support. Machado (2022) observed that this alignment produced positive socioeconomic effects in municipalities in Rio Grande do Sul.

Another noteworthy result refers to the variable Works, which presented a positive and statistically significant coefficient. This indicates that mayors who make greater investments in infrastructure are more likely to be reelected. This finding corroborates the results of Machado et al. (2022), who showed that increased investment in public works, especially in election years, tends to be rewarded by the electorate.

As for intergovernmental transfers, the Transf_uni variable had a positive and statistically significant coefficient, suggesting that an increase in the volume of funds transferred by the federal government is associated with a greater chance of reelection for mayors, which is in line with the findings of Machado (2022). On the other hand, the Transf_est variable, referring to transfers from states, did not show relevant statistical significance, indicating less influence on the electoral outcome.

Finally, the Gini index showed a negative and statistically significant coefficient at the 1% level, demonstrating that mayors of municipalities with greater income inequality face lower chances of reelection. This result is in line with Almeida and Saiani (2021), who point out that high levels of inequality reduce the sense of social well-being, compromising the positive evaluation of management and, consequently, the electoral competitiveness of the incumbent.

4.4 Marginal Effects Analysis

Table 4 presents the results of the LOG2 model, estimated by logistic regression, with the aim of identifying the factors associated with the probability of reelection of Brazilian mayors. To make the results more intuitive and aligned with good methodological practices, the average marginal effects (AMEs) were calculated in Table 5, which express the average variation in the probability of reelection associated with a marginal change in each explanatory variable, keeping the others constant.

Table 4. Results of the odds ratio of the Log2 model

Reelection	Odds Ratio	Standard Deviation	z	P>|z|	[95% Conf.	Interval]
Contract	1.489507	0.280107	2.12	0.034	1.030318	2.153345
Partgov	1.321797	0.058325	6.32	0	1.212286	1.441202
Partpres	1.716872	0.113821	8.15	0	1.507673	1.955098
logPibpc	0.998525	0.050725	-0.03	0.977	0.903895	1.103062
logWorks	1.378936	0.027492	16.12	0	1.326092	1.433887
logPop	1.162768	0.035401	4.95	0	1.095413	1.234265
logTrans_uni	1.212847	0.083592	2.8	0.005	1.059594	1.388266
logTrans_est	1.059511	0.052255	1.17	0.241	0.961886	1.167043
GINI	0.267182	0.096149	-3.67	0	0.131975	0.540908

Source: Prepared by the authors.

Table 5. Result of the odds ratio of the Average Marginal Effects (AMEs) model

Variable	AME
Contract	0.407
Part_gov	0.033
Presidential share	0.064
logGDP	0.000
logConstruction	0.038
logPop	0.018
logTrans_uni	0.023
logTrans_est	0.006
GINI	-0.158

Source: Prepared by the authors.

The results indicate that a 1 percentage point increase in the proportion of fixed-term contracts in the municipality is associated, on average, with a 0.4 percentage point (p.p.) increase in the probability of the mayor's reelection. This finding suggests that the use of this form of hiring may be perceived positively by the electorate, possibly because of its association with policies to expand local employment.

The mayor's affiliation with the same party as the governor and the president also has positive effects. Being affiliated with the same party as the governor increases the probability of reelection by 0.28 p.p. on average, while being affiliated with the same party as the president increases the chance of reelection by 0.54 p.p. on average. These results suggest that political support in other spheres of the executive branch may favor the mayor's continuity in office.

The marginal effects for continuous variables such as investments in public works, GDP per capita, population, federal transfers, and the Gini index were also estimated and can be found in the supplementary table of AMEs (Table 5). Among them, the positive effect of spending on public works stands out, as it had one of the greatest impacts on the chance of reelection.

In order to verify the robustness of the results found, a Logit model was estimated that considers the possible effects of regional differences on the probability of reelection of municipal executive branch leaders. The results of this analysis are presented in Table 6.

Table 6. Results of the odds ratio of the Logit model with regional heterogeneity

Re-elected	Odds Ratio	Standard Deviation	z	P>|z|	[95% Conf.	Interval]
Contract	1.583622	0.251054	2.9	0.004	1.160671	2.160697
Partgov	1.415386	0.058789	8.36	0.000	1.304727	1.53543
Partpres	1.203028	0.075055	2.96	0.003	1.064562	1.359504
logPibpc	1.123507	0.051886	2.52	0.012	1.026279	1.229946
logWorks	1.207701	0.020234	11.26	0.000	1.168687	1.248018
logPop	1.333457	0.031547	12.16	0.000	1.273037	1.396744
logTrans_uni	2.358931	0.125674	16.11	0.000	2.125038	2.618567
logTrans_est	1.039515	0.045405	0.89	0.375	0.954227	1.132427
GINI	0.240787	0.081772	-4.19	0.000	0.123755	0.468494
Northeast	1.405459	0.125598	3.81	0.000	1.179644	1.6745
North	1.293135	0.133203	2.5	0.013	1.056728	1.58243
Southeast	1.077212	0.090995	0.88	0.379	0.912847	1.271172
South	1.064854	0.093534	0.72	0.474	0.896443	1.264904

Source: Prepared by the authors.
Note: The Midwest region is omitted from the estimation to avoid exact multicollinearity and serves as a reference category for comparison with other regions.

The average marginal effects (AME) associated with regional variables are shown in Table 7. The results indicate that, in municipalities located in the Northeast region, the probability of mayors being re-elected is, on average, 4.2 percentage points higher than that observed in municipalities in the Midwest region, considered as the reference category. This effect proved to be statistically significant at the 1% level, even after controlling for the other explanatory variables. In municipalities in the North region, the probability of mayors being re-elected is, on average, 3.1 percentage points higher than that of mayors in the Midwest, also with the effects of explanatory and control variables duly considered.

On the other hand, for municipalities in the South and Southeast regions, no statistically significant evidence was found that regional characteristics influence the chance of mayors being re-elected, when compared to the reference category (Midwest).

Table 7. Average Marginal Effects (AMEs) Results

Variable	AME
Northeast	0.042
North	0.031
Southeast	0.008
South	0.007

Source: Prepared by the authors.

Another econometric exercise performed was the re-estimation of the model based on the stratification of data by population size. The objective of this exercise is to capture the heterogeneous effects that the percentage of spending on hiring personnel may have on the chance of re-election of mayors.

More specifically, the estimation was conducted considering three population strata: municipalities with up to 10,000 inhabitants, which correspond to approximately 44% of the sample; municipalities with a population between 10,000 and 50,000 inhabitants, which also represent about 44% of the sample; and municipalities with more than 50,000 inhabitants, which make up approximately 12% of the sample. The results of this analysis are presented in Table 8.

It can be seen that the percentage of spending on temporary contracts has a statistically significant effect on the chance of reelection in municipalities with a population between 10,000 and 50,000 inhabitants, as well as in those with more than 50,000 inhabitants. Thus, the hypothesis formulated by this research was not rejected for these population strata.

On the other hand, in municipalities with a population of less than 10,000 inhabitants, no statistically significant effects were observed in this relationship. In this case, the lack of significance may indicate that spending on temporary contracts is not the main channel through which electoral incentives manifest themselves (direct relationships and other mechanisms may carry more weight) and/or that there is little variation in this expenditure and greater registration noise, which reduces the power to detect effects. This is consistent with the estimated result for this stratum ($p=0.153$).

The average marginal effects (AME) are shown in Table 9. It can be seen that, for municipalities with a population between 10,000 and 50,000 inhabitants, a 1 percentage point increase in spending on temporary contracts raises the probability of reelection of the mayor by approximately 0.083 percentage points. In municipalities with more than 50,000 inhabitants, this same increase is associated with an estimated 0.144 percentage point increase in the chance of reelection.

Common party affiliation between mayors and the state governor, as well as between mayors and the president of the Republic, had statistically significant effects in the three population strata analyzed.

Table 9. Results of Average Marginal Effects (AMEs)

Variable	AME
Contract (Pop≤10,000)	-0.050
Partgov (Pop≤10,000)	0.039
Partpres (Pop≤10,000)	0.028
Contract (10,000 <Pop≤50,000)	0.083
Partgov (10,000 <Pop≤50,000)	0.043
Partpres (10,000 <Pop≤50,000)	0.017
Contract (Pop>50,000)	0.144
Partgov (Pop>50,000)	0.053
Partpres (Pop>50,000)	0.032

Source: Prepared by the authors.

5 Final Considerations

This study aimed to analyze the extent to which personnel expenses incurred through temporary contracts are associated with the chances of reelection for Brazilian mayors. The results showed statistical significance, indicating that in municipalities with higher percentages of fixed-term contracts, mayors are more likely to be re-elected. Taken together, these findings are consistent with the literature on opportunistic political cycles (Feldman & Gouveia, 2022; França, 2019), suggesting that the greater use of temporary contracts—due to their more flexible and potentially discretionary nature—

Table 8. Odds ratio result of the Logit model for population strata

	Pop≤10,000		10,000<Pop≤50,000		Pop>50,000	
Reelection	Odds Ratio	P>|z|	Odds Ratio	P>|z|	Odds Ratio	P>|z|
Contract	0.684601	0.153	1.988999	0.002	2.965072	0.014
Partgov	1.346829	0.000	1.434359	0.000	1.498192	0.000
Partpres	1.243766	0.027	1.15812	0.120	1.275863	0.101
logGDPpc	1.20453	0.006	1.002316	0.973	1.1297	0.473
logWorks	1.218105	0.000	1.180716	0.000	1.212281	0.000
logPop	3.091949	0	1.290901	0.000	1.270926	0.000
logTrans_uni	4.983553	0.000	3.429857	0.000	1.456297	0.002
logTrans_est	0.847838	0.011	1.003394	0.956	1.17116	0.268
GINI	0.616308	0.301	0.146283	0.000	0.372252	0.252
Observations	10803		12939		3712	

Source: Prepared by the authors.

may be associated with better electoral performance in election years, although this does not allow us to infer, on its own, the individual intentions of managers.

The research is particularly relevant because it considers the legal restrictions imposed by electoral legislation on the last two quarters of the election year, a period in which such hiring is prohibited, except in cases where there are proven essentiality and urgency of public service. This regulatory context reinforces the importance of investigating whether the recurring practice of temporary hiring, often carried out outside this prohibited period, is being used as a pattern compatible with electoral incentives on a potential competitive asymmetry, configuring and compromising the equality of the electoral process.

The findings also suggest that fixed-term hiring, although constitutionally provided for as an exception, has been used as a substitute for public competitions, which may be associated with electoral incentives. This practice can create democratic imbalances by benefiting incumbent candidates to the detriment of fair and equitable competition.

However, it is important to recognize some limitations in interpreting the findings. First, the analysis does not separate mayors in their first term, who may have different incentives. Second, the variable for temporary contracts is aggregated and does not allow for functional disaggregation (e.g., health), so it is not possible to distinguish between hiring motivated by public needs—potentially more intense in COVID-19—and hiring that is possibly more discretionary. Thus, the results should be read as aggregate patterns, with caution regarding the mechanisms.

In this way, the study contributes to the deepening of discussions on the strategic use of personnel management instruments in the electoral context and offers support for the actions of internal and external control bodies (Legislative Branch and Courts of Auditors), the Judiciary, the Public Prosecutor's Office, and social control through civil society. This reinforces the importance of rigorous oversight and the value of public competitive examinations as a legitimate mechanism for access to public service.

For future research, we suggest broadening the scope of explanatory variables, conducting comparative regional analyses, and investigating specific sectors, such as health , with a view to assessing whether the COVID-19 pandemic was used as a justification for intensifying temporary hiring and what effects these decisions had on election results and public management.

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