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PRESIDENTIAL ELECTIONS AND STOCK RETURNS OF BRAZILIAN STATE-LINKED FIRMS FROM 1998 TO 2022

ELEIÇÕES PRESIDENCIAIS E RETORNOS DAS AÇÕES DE EMPRESAS BRASILEIRAS COM PARTICIPAÇÃO ESTATAL, DE 1998 A 2022

ELECCIONES PRESIDENCIALES Y RENTABILIDAD BURSÁTIL DE EMPRESAS BRASILEÑAS VINCULADAS AL ESTADO, DE 1998 A 2022

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Vitor da Silva Kunz[1], **Angélica Pott de Medeiros**[2]

ABSTRACT

This study describes stock returns around seven Brazilian presidential elections from 1998 to 2022 for Banco do Brasil, BB Seguridade, Caixa Seguridade, Eletrobras, Telebras, and Petrobras. Five windows surrounding the first round are examined using cumulative abnormal returns calculated as the sum of daily returns in excess of a fixed, historically calibrated CAPM-style benchmark. The unbalanced panel provides 154 complete firm-window observations out of 210 potential combinations. Analytical tests of zero CAR use a first-order forecast variance with Bartlett-weighted autocovariances and a normal approximation. Of 142 tested CARs, 15 have nominal p-values below .05; three remain significant after Holm adjustment at the 10% level. The analysis does not identify causal election effects. In 2018, all five observed firms have positive values in both post-election windows. In 2022, four of six firms have positive values at four weeks, while only two of the five firms with complete data have positive values at thirteen weeks. The results document differences across firms and horizons, subject to benchmark sensitivity, overlapping windows, and incomplete historical coverage. The study provides longitudinal evidence on firm-specific election-period returns in Brazil.

Keywords: Presidential Elections. State-Owned Enterprises. Political Risk. Abnormal Returns. Event Study. Brazil.

RESUMO

Este estudo descreve os retornos das ações de Banco do Brasil, BB Seguridade, Caixa Seguridade, Eletrobras, Telebras e Petrobras em torno de sete eleições presidenciais brasileiras, ocorridas entre 1998 e 2022. São examinadas cinco janelas temporais em torno do primeiro turno, utilizando retornos anormais acumulados (CAR, na sigla em inglês), calculados como a soma dos retornos diários que excedem um referencial (benchmark) fixo, calibrado historicamente com base no modelo CAPM. O painel não balanceado resulta em 154 observações completas (empresa-janela) de um total de 210 combinações possíveis. Os testes analíticos para verificar se o CAR é igual a zero utilizam a variância de previsão de primeira ordem, com autocovariâncias ponderadas pelo método de Bartlett e uma aproximação pela distribuição normal. Dos 142 valores de CAR testados, 15 apresentam p-valores nominais abaixo de 0,05; três permanecem significativos após o ajuste de Holm ao

[1] Undergraduate student in Administration. Universidade Federal de Santa Maria (UFSM).
E-mail: vitor.kunz@acad.ufsm.br
[2] PhD in Administration. Universidade Federal de Santa Catarina (UFSC).
E-mail: angelica.medeiros@ufsm.br

nível de 10%. A análise não identifica efeitos causais das eleições. Em 2018, todas as cinco empresas observadas apresentaram valores positivos em ambas as janelas pós-eleição. Em 2022, quatro das seis empresas registraram valores positivos na janela de quatro semanas, enquanto apenas duas das cinco empresas com dados completos apresentaram valores positivos na janela de treze semanas. Os resultados documentam diferenças entre empresas e horizontes temporais, estando sujeitos à sensibilidade em relação ao referencial adotado, à sobreposição de janelas e à cobertura histórica incompleta. O estudo fornece evidências longitudinais sobre os retornos de empresas específicas durante períodos eleitorais no Brasil.

Palavras-chave: Eleições Presidenciais. Empresas Estatais. Risco Político. Retornos Anormais. Estudo de Eventos. Brasil.

RESUMEN

Este estudio describe los rendimientos bursátiles en torno a siete elecciones presidenciales brasileñas, celebradas entre 1998 y 2022, para las empresas Banco do Brasil, BB Seguridade, Caixa Seguridade, Eletrobras, Telebras y Petrobras. Se examinan cinco ventanas temporales en torno a la primera vuelta electoral, utilizando rendimientos anormales acumulados (CAR, por sus siglas en inglés), calculados como la suma de los rendimientos diarios que exceden a un punto de referencia fijo, calibrado históricamente según el modelo CAPM. El panel no balanceado arroja 154 observaciones completas (empresa-ventana) de un total de 210 combinaciones posibles. Para las pruebas analíticas sobre la hipótesis de CAR igual a cero, se emplea una varianza de pronóstico de primer orden con autocovarianzas ponderadas mediante el método de Bartlett y una aproximación a la distribución normal. De los 142 CAR analizados, 15 presentan valores p nominales inferiores a 0,05; tres de ellos permanecen estadísticamente significativos al nivel del 10 % tras aplicar el ajuste de Holm. El análisis no permite identificar efectos causales derivados de las elecciones. En 2018, las cinco empresas observadas registraron valores positivos en ambas ventanas posteriores a las elecciones. En 2022, cuatro de las seis empresas presentaron valores positivos a las cuatro semanas, mientras que, a las trece semanas, solo dos de las cinco empresas con datos completos mostraron valores positivos. Los resultados ponen de manifiesto diferencias entre empresas y horizontes temporales, los cuales están sujetos a la sensibilidad respecto al punto de referencia, al solapamiento de las ventanas temporales y a una cobertura histórica incompleta. El estudio aporta evidencia longitudinal sobre los rendimientos específicos de cada empresa durante los periodos electorales en Brasil.

Palabras clave: Elecciones Presidenciales. Empresas Estatales. Riesgo Político. Rendimientos Anormales. Estudio de Eventos. Brasil.

1 INTRODUCTION

Presidential elections play a central role in shaping investors' expectations and influencing financial market dynamics. Electoral periods are commonly associated with heightened uncertainty, as markets anticipate potential changes in economic policy, regulatory frameworks, and governance structures. As a result, asset prices often exhibit increased volatility around elections, reflecting investors' responses to political risk. In emerging economies such as Brazil, where institutional fragilities and macroeconomic volatility tend to be more pronounced, the effects of electoral processes on financial markets may be particularly significant (Pantzalis et al., 2000; Stiglitz et al., 2006).

The World Economic Forum (2023) identifies erosion of social cohesion and societal polarization as the fifth most severe global risk over a two-year horizon. Its assessment links polarization with political instability and constraints on collective responses to economic and social challenges. The report discusses Brazil's closely contested 2022 presidential election as an example of political polarization (World Economic Forum, 2023). Firms linked to government ownership provide a relevant setting for examining stock returns around elections in this context.

From an empirical standpoint, a substantial body of literature has investigated the relationship between elections and the Brazilian financial market, employing diverse methodologies and analytical perspectives. Early studies, such as Rennó and Spanakos (2006), examined the interaction between macroeconomic fundamentals, financial market indicators, and voting intentions in presidential elections between 1994 and 2002, finding that voter behavior in Brazil is primarily retrospective and based on economic fundamentals rather than financial market signals. Subsequent research expanded the analysis to assess the influence of political cycles on asset risk and returns. Araújo Júnior et al. (2016), for example, demonstrated that political cycles significantly affect both risk and return in the Brazilian stock market, with state-owned enterprises exhibiting greater sensitivity to political variables.

Other studies have focused explicitly on political uncertainty and its transmission to financial markets. Nunes (2017) provided evidence of a negative relationship between political uncertainty and stock market returns, alongside a positive relationship with market volatility, while Santana (2018) showed that elections and impeachment processes constitute political risk events that reduce returns and increase volatility in the Ibovespa. Complementary evidence is offered by Murashima (2018), who found that equity investment funds tend to underperform during electoral periods. Batista et al. (2018) found no statistically significant

abnormal or cumulative abnormal returns at the 5% level around the three 2016 impeachment events they analyzed, a finding they interpreted as consistent with semi-strong market efficiency in that setting. M. R. Silva (2018), examining voting-intention polls during the 2018 presidential election, reported significant cumulative abnormal returns and interpreted the findings as suggestive of semi-strong efficiency. These studies concern distinct political events, highlighting the importance of event definition when comparing market responses.

More recent contributions have examined sectoral effects and firm-level responses to electoral events. B. D. Silva (2020) identified heterogeneous impacts across economic sectors, while Jacob Júnior and Souza (2020) documented statistically significant abnormal returns in major Brazilian financial institutions during the 2018 presidential election. Studies focusing on state-owned enterprises, such as Schmidt et al. (2020), Alves (2022), Pereira et al. (2022), and Frossard and Moreira (2023), provide evidence that electoral outcomes generate abnormal returns and affect volatility, particularly for firms with stronger links to government control, such as Banco do Brasil and Petrobras.

In Brazilian literature, some studies have focused more specifically on the behavior of state-owned enterprises and on various phases of the electoral cycle. Maria and Leismann (2015), for instance, examined the variation in risk of state-controlled firms listed on the Ibovespa during years with presidential elections compared to non-election years. Their results suggest that, when analyzed jointly, state-owned firms do not exhibit statistically significant differences in average risk across these periods, although heterogeneous effects emerge at the firm level, particularly for Banco do Brasil.

International evidence further reinforces the argument that state-owned enterprises are especially vulnerable to electoral uncertainty. Harymawan et al. (2020) documented that Indonesian state-owned enterprises experienced more pronounced negative performance during electoral periods compared to private firms. Inoue (2020) showed that political incentives negatively affect the performance of state-owned firms in the water and sanitation sector. Wong and Hooy (2016) found that state-owned banks in Indonesia, Malaysia, and Thailand exhibit stronger reactions to electoral outcomes, while Kim et al. (2019) found no significant association between public elections and state-owned enterprises' financial performance in South Korea, although government performance evaluation scores were lower in election years.

Building on studies of individual elections and politically sensitive firms, including Frossard and Moreira (2023), this study compares several firms across seven electoral cycles

from 1998 to 2022. The longitudinal perspective allows the patterns observed in 2022 to be examined alongside earlier elections and across pre-election and post-election horizons.

Against this background, this study examines stock returns around Brazilian presidential elections from 1998 to 2022 for a historical sample of firms linked to federal ownership, with particular attention to the 2022 electoral cycle. By covering seven elections within an event study framework, the analysis documents differences across firms and observation horizons. The findings offer evidence relevant to the study of political risk, public ownership, and financial markets in emerging economies.

The remainder of the article develops the institutional background and research questions, describes the data and event study design, presents the results, and discusses their implications and limitations.

2 INSTITUTIONAL BACKGROUND AND RESEARCH QUESTIONS

State ownership creates a direct connection between electoral competition and corporate decision-making. A change in government can alter expectations about management appointments, investment priorities, dividend policies, and the balance between commercial and public objectives. The relevance of these channels varies across firms. A bank, an oil producer, an electricity company, and a telecommunications firm face different operating constraints and policy exposures, even when they share a history of federal ownership. Political exposure therefore provides a reason to expect heterogeneous responses across firms.

The literature examines stock returns, return volatility, accounting performance, and managerial decisions. Harymawan et al. (2020), Inoue (2020), Kim et al. (2019), and Wong and Hooy (2016) motivate the broader relationship between political processes and corporate outcomes. The outcome examined here is cumulative abnormal stock returns around elections.

Brazilian contributions establish the relevance of electoral uncertainty while also documenting differences across research designs and institutional settings. Fernandes (2016), Santos (2017), and A. Silva et al. (2017) examine related dimensions of political events and market behavior. Guimarães and Silva (2020) study chief executive succession in Brazilian state-owned enterprises, identifying a governance dimension relevant to the broader discussion of political exposure. Evidence from political instability outside Brazil, including Zaiane (2018), further illustrates why event definitions and institutional contexts

matter for comparisons. Their different institutional settings motivate an election-specific examination of Brazilian firms.

Three questions guide the empirical analysis. First, how do the signs and magnitudes of cumulative abnormal returns vary across presidential elections? Second, what patterns appear across firms within the same electoral cycle? Third, how does 2022 compare with earlier elections and across pre-election and post-election horizons? The comparisons describe firm-specific outcomes, complemented by tests of whether individual CARs differ from zero.

Eletrobras was privatized in June 2022, before the presidential election (Casa Civil, 2022). Its 2022 observations therefore represent a formerly state-controlled firm within a historical sample of companies linked to federal ownership.

3 DATA AND METHODS

3.1 RESEARCH DESIGN AND ELECTORAL WINDOWS

The study uses an event study framework for seven Brazilian presidential elections, following the distinction between normal returns and event-period abnormal returns discussed by Campbell et al. (1997). The sample comprises six firms and five windows for each election. Table 1 identifies the electoral dates, and Appendix A specifies the inclusive window boundaries.

Table 1

Brazilian presidential elections from 1998 to 2022

Elected president	Term	Party	First round	Second round
Fernando H. Cardoso	II	PSDB	04/10/1998	-
Luiz Inácio Lula da Silva	I	PT	06/10/2002	27/10/2002
Luiz Inácio Lula da Silva	II	PT	01/10/2006	29/10/2006
Dilma Rousseff	I	PT	03/10/2010	31/10/2010
Dilma Rousseff	II	PT	05/10/2014	26/10/2014
Jair Messias Bolsonaro	I	PSL	07/10/2018	28/10/2018
Luiz Inácio Lula da Silva	III	PT	02/10/2022	30/10/2022

Source: Authors' compilation. Dates are day/month/year; a dash indicates no second round.

The labels −13w, −4w, 0, +4w, and +13w identify approximate horizons relative to the first round. Window 0 spans three or four observed index sessions. The windows overlap, and the pre-election windows include the first session after the first round. Post-election windows may encompass runoff voting and subsequent announcements, while wider windows include multiple political and economic developments.

3.2 DATA, SAMPLE, AND COVERAGE

The sample comprises Banco do Brasil (BBAS3), BB Seguridade (BBSE3), Caixa Seguridade (CXSE3), Eletrobras (ELET3), Telebras (TELB4), and Petrobras (PETR4). Adjusted closing prices were obtained from Economatica for 1997–2023. The available Ibovespa export spans April 1998 to March 2023. The analysis uses sessions identified by observed Ibovespa prices, rather than assuming every weekday is a trading session. The Selic series provides annual percentage rates on a 252-day basis. Eletrobras' 2022 observations reflect its post-privatization status, as discussed in Section 2.

Each stock is aligned to the observed index-price calendar before returns are calculated. A daily simple return requires observed prices in consecutive sessions. Missing values remain missing. A full-window CAR requires every event return and a finite benchmark. Of the 210 potential combinations, 154 have complete results, 52 have insufficient calibration coverage, and four have incomplete event returns. Appendix B reports coverage. BB Seguridade and Caixa Seguridade enter the reported panels in 2014 and 2022, respectively, because earlier elections lack sufficient calibration history.

3.3 FIXED EXPECTED-RETURN BENCHMARK

For firm i and window w, starting at T_1 and ending at T_2, daily simple returns are computed from the exported adjusted closing prices. The Selic annual percentage rate s is converted to a daily rate. Beta is estimated from paired stock and market excess returns in the inclusive calendar interval [T_1 − 365 days, T_1].

$$R_{it} = P_{it} / P_{i,t-1} - 1; \quad r^f_t = (1 + s_t / 100)\text{^}(1/252) - 1 \quad (1)$$

$$\beta_i w = Cov(R_{it} - r^f_t, R_{mt} - r^f_t) / Var(R_{mt} - r^f_t) \quad (2)$$

The expected daily return is constant within each event window. It combines the last available daily Selic rate on or before T_1, denoted $r^f w$, with the mean of the last 365 available index returns on or before T_1, denoted $\bar{R}_m w$. When fewer observations exist at the beginning of the market series, the available history is used and its size is recorded. The fixed CAPM-style benchmark therefore depends on historical market information.

$$\hat{\mu}_i w = r^f w + \beta_i w \, (R_m w - r^f w) \quad (3)$$

Calibration sizes among reported results range from 8 to 251, and market-history sizes range from 60 to 365. Appendix B reports these counts. Telebras has 8 or 9 calibration observations in the three reported windows in 1998. Calibration includes T_1, which can also enter the event window; the variance estimator accounts for this shared boundary.

3.4 CUMULATIVE ABNORMAL RETURNS AND INTERPRETATION

$$AR_{it}w = R_{it} - \hat{\mu}_i w; \quad CAR_i w = \sum_{t \in Ww} AR_{it}w \quad (4)$$

CAR is the terminal sum over Ww, the set of observed index sessions within the inclusive window. Values are in decimal units: 0.10 represents ten percentage points of summed daily abnormal returns. Table 2 reports CARs and significance markers from Section 3.5. Appendix B reports observation counts.

For each tested firm-window observation, the null hypothesis is that its expected CAR equals zero under the fixed historical benchmark. The test concerns the individual CAR, while comparisons across firms and horizons are descriptive.

3.5 STATISTICAL INFERENCE

Each CAR is standardized by its estimated forecast standard deviation, allowing for event-return variation and normal-return estimation (MacKinlay, 1997). A first-order delta expansion includes beta and the historical market mean, their cross-covariances with event returns, and the shared calibration/event boundary. The observed risk-free benchmark input is held fixed. Appendix C derives this variance.

Joint autocovariances use the final contiguous complete sequence strictly before the window, within the latest 365 index sessions. The Bartlett construction follows Newey and West (1987), with lag truncation q = floor[4(nR/100)^(2/9)] for nR reference observations. Tests require at least 60 reference observations and 60 calibration pairs. Twelve complete CARs do not meet these coverage requirements.

The statistic Z = CAR/SE(CAR) gives a two-sided approximate p-value of 2Φ(−|Z|). Inference assumes stable joint moments, weak dependence with summable autocovariances, and finite fourth moments. The normal approximation is an additional distributional assumption, particularly restrictive for three- and four-session windows. First-order linearization and the fixed risk-free input limit the uncertainty captured.

Table 2 uses nominal 10%, 5%, and 1% levels. Holm (1979) adjustment uses a 10% threshold across all 142 tests and allows dependence when marginal p-values are valid. Appendix D reports nominal p-values; Supplementary Table S1 gives standard errors, Z statistics, adjusted p-values, coverage, and lag sensitivity.

4 RESULTS

4.1 COVERAGE AND HISTORICAL COMPARISON

Table 2 reports the firm-window CARs, with missing entries where calibration or event coverage is insufficient. The panel is unbalanced and windows overlap. Comparisons therefore concern observed firm-specific returns relative to the fixed benchmark, rather than a balanced estimate of an election-wide response.

4.2 SIGNIFICANCE OF CUMULATIVE ABNORMAL RETURNS

Among the 142 tested observations, 25 have nominal $p < .10$, 15 have $p < .05$, and eight have $p < .01$. Three observations have Holm-adjusted $p < .10$. Telebras in the 2002 −13w window has CAR = 4.9931, SE = 1.2526, Z = 3.9862, and adjusted p = 0.0095. Petrobras and Banco do Brasil in the short 2014 window have adjusted p-values of 0.0015 and 0.0527, respectively. The two 2014 results occur in a four-session window and depend especially on the normal approximation. The positive post-election values in 2018 and the sign differences in 2022 do not imply broad statistical significance.

Doubling the Bartlett lag truncation changes one nominal 5% decision: Telebras in the 2014 −4w window has $p = .0686$ in the main specification and $p = .0438$ with the larger truncation. The reference history is used to estimate predictive covariance; changes in volatility or other market conditions during an election window may affect the quality of this approximation.

4.3 THE 2018 ELECTION

In 2018, all five firms with available post-election observations have positive CARs at both +4w and +13w. At +4w, values range from 0.0817 for BB Seguridade to 0.2896 for Eletrobras. At +13w, Petrobras records 0.0460, BB Seguridade 0.1046, Banco do Brasil 0.2693, Eletrobras 0.4443, and Telebras 0.5287. Caixa Seguridade has no estimable observations in this cycle. These common signs are descriptive and do not demonstrate a common causal response.

4.4 THE 2022 ELECTION

In 2022, all six firms have positive CARs in the −13w window. At −4w, only Telebras remains positive. In the short window labeled 0, five firms have positive values and BB Seguridade has a negative value of −0.0192. These windows overlap and use separately calibrated benchmarks; their differences cannot be interpreted as the abnormal return of the intervening period.

At +4w, four firms have positive values: BB Seguridade (0.1106), Caixa Seguridade (0.0406), Eletrobras (0.1595), and Petrobras (0.0218). Banco do Brasil (−0.0216) and Telebras (−0.0502) have negative values. At +13w, BB Seguridade (0.2242) and Caixa Seguridade (0.0106) remain positive, whereas Banco do Brasil (−0.0789), Eletrobras (−0.0266), and Petrobras (−0.0785) are negative. Telebras has incomplete event returns and no reported +13w CAR.

4.5 COMPARISONS ACROSS FIRMS AND HORIZONS

Post-election CARs are more often positive in 2018 than in 2022. In 2022, the insurers have positive +13w values, while Banco do Brasil, Eletrobras, and Petrobras have negative values. These comparisons do not test between-firm differences or rank political sensitivity.

Table 2

Terminal cumulative abnormal returns

Panel A. 1998

Window	BBAS3	ELET3	TELB4	PETR4
-13w	-0.1543‡	-0.1179‡	—C	-0.4418‡
-4w	-0.0001	0.4551**	—C	0.0728
0	0.0407	-0.0994	-0.3883‡	-0.0129
+4w	-0.0386	0.2955	-0.2961‡	0.3573
+13w	—M	0.3464	2.1745‡	0.4548

Notes: CARs are expressed in decimal units. *, **, *** indicate two-sided nominal p < .10, .05, .01. ‡ indicates a CAR without an estimated test. —C: insufficient calibration. —M: incomplete event returns. P-values are in Appendix D.

Panel B. 2002

Window	BBAS3	ELET3	TELB4	PETR4
-13w	0.1776	-0.4384	4.9931***H	-0.1242
-4w	-0.0906	-0.1758	1.0481	-0.1319
0	0.0260	0.0187	0.5100	0.0006
+4w	0.1488	0.2829*	1.0501	0.0724
+13w	0.2003	0.4863*	4.1454***	0.2553

Notes: CARs are expressed in decimal units. *, **, *** indicate two-sided nominal p < .10, .05, .01. H indicates Holm-adjusted p < .10. P-values are in Appendix D.

Panel C. 2006

Window	BBAS3	ELET3	TELB4	PETR4
-13w	-0.0456	-0.0147	0.1676	-0.1346
-4w	-0.0241	0.0143	0.1178	-0.0954
0	0.0364	0.0679	0.1974*	-0.0481
+4w	0.0566	-0.1041	0.0492	0.0252
+13w	0.2530	-0.0005	0.2152	0.1630

Notes: CARs are expressed in decimal units. *, **, *** indicate two-sided nominal p < .10, .05, .01. P-values are in Appendix D.

Panel D. 2010

Window	BBAS3	ELET3	TELB4	PETR4
-13w	0.1652	-0.0861	-0.1487	-0.0288
-4w	0.1222	0.0165	-0.0120	-0.0759
0	0.0442	0.0654	-0.0326	-0.0240
+4w	0.0058	0.0926	0.0545	-0.0564
+13w	-0.1013	-0.0033	-0.1278	-0.0699

Notes: CARs are expressed in decimal units. P-values are in Appendix D.

Panel E. 2014

Window	BBAS3	BBSE3	ELET3	TELB4	PETR4
-13w	0.2318	0.0009	0.1743	-0.0981	0.2345
-4w	-0.1355	-0.0944	-0.1079	0.2094*	-0.0911
0	0.1704***H	0.0086	0.1332**	-0.1614**	0.2252***H
+4w	0.0808	0.0324	-0.0208	-0.1948	-0.1680
+13w	-0.0879	-0.0749	-0.0851	—M	-0.6741***

Notes: CARs are expressed in decimal units. *, **, *** indicate two-sided nominal p < .10, .05, .01. H indicates Holm-adjusted p < .10. —M: incomplete event returns. P-values are in Appendix D.

Panel F. 2018

Window	BBAS3	BBSE3	ELET3	TELB4	PETR4
-13w	0.2893	0.1037	0.4317	—M	0.3782*
-4w	0.2994***	0.0780	0.3336*	0.1564‡	0.3371***
0	0.1289**	0.0682**	0.2680***	0.0424‡	0.1205**
+4w	0.1831	0.0817	0.2896	0.1710‡	0.1532
+13w	0.2693	0.1046	0.4443	0.5287‡	0.0460

Notes: CARs are expressed in decimal units. *, **, *** indicate two-sided nominal p < .10, .05, .01. ‡ indicates a CAR without an estimated test. —M: incomplete event returns. P-values are in Appendix D.

Panel G. 2022

Window	BBAS3	BBSE3	CXSE3	ELET3	TELB4	PETR4
-13w	0.2928*	0.1003	0.2832	0.0498	0.0647‡	0.3873**
-4w	-0.0129	-0.0412	-0.0253	-0.0098	0.0341‡	-0.0292
0	0.0226	-0.0192	0.0121	0.0495	0.0438	0.0741*
+4w	-0.0216	0.1106	0.0406	0.1595*	-0.0502	0.0218
+13w	-0.0789	0.2242*	0.0106	-0.0266	—M	-0.0785

Notes: CARs are expressed in decimal units. *, **, *** indicate two-sided nominal p < .10, .05, .01. ‡ indicates a CAR without an estimated test. —M: incomplete event returns. P-values are in Appendix D.

5 DISCUSSION

5.1 ELECTORAL UNCERTAINTY AND HETEROGENEOUS VALUATIONS

The findings place several firms and electoral cycles within a common framework, showing descriptive variation in the signs and magnitudes of CARs. Statistical evidence of departures from the historical benchmark is concentrated in three observations after Holm adjustment at the 10% level: Telebras in the 2002 −13w window and Petrobras and Banco do Brasil in the short 2014 window. The patterns can be discussed alongside electoral uncertainty in Pantzalis et al. (2000) and the heterogeneous responses reported in the Brazilian literature, but they do not establish a general electoral effect. The positive post-election values in 2018 and the mixed signs in 2022 should be interpreted within these limits.

A plausible explanation for the variation is that investors reassess both expected cash flows and the risks associated with future policy. Expectations about credit allocation, energy policy, investment, dividends, and management may differ across firms. These channels provide an economic interpretation of the patterns, but are not directly identified by the return estimates. The analysis does not contain measures of investor beliefs, policy surprises, or firm-specific political connections that would separate those mechanisms.

The 2022 findings illustrate dependence on the selected horizon: four positive +4w values coexist with only two positive values among five complete +13w observations. This documents an evolving return pattern but does not identify its causes. Polarization is not separately measured, and comparison with 2018 does not establish a partisan effect because economic conditions, information sets, and sample coverage differ.

5.2 IMPLICATIONS FOR INVESTORS AND ECONOMIC POLICY

For investors, the descriptive variation highlights the relevance of the firm and the observation horizon when assessing exposure to state-linked companies. The sample provides little evidence of a stable directional pattern across electoral cycles. Banks, insurers,

energy companies, and telecommunications firms face distinct commercial and policy environments, which merit attention when interpreting the observed returns.

For policymakers, the setting highlights the relationship between public ownership, policy expectations, and capital market valuation. Information about corporate objectives, governance arrangements, and transition plans can help frame the interpretation of market outcomes. These considerations arise from the institutional setting; the study estimates election-period CARs rather than the effects of particular disclosure or governance reforms.

5.3 LIMITATIONS AND FUTURE RESEARCH

Several limitations bound the conclusions. First, the sample is small and selected for its links to the federal government. It contains neither a comprehensive set of listed Brazilian firms nor a matched private-sector control group. Consequently, the results cannot establish that state-owned enterprises respond more strongly than private firms. The unbalanced availability of observations further limits comparisons of aggregate behavior over time, and Eletrobras' privatization changes the institutional interpretation of its 2022 observations.

Second, the event windows do not isolate the final electoral result in elections decided by a runoff. Wider windows encompass political announcements and non-electoral developments. The fixed expected-return benchmark is based on historical market information and does not remove contemporaneous market movements or firm-specific shocks. Observed abnormal returns therefore cannot be attributed to elections alone.

Third, common dates and overlapping windows induce dependence across observations. The analytical variance includes temporal and benchmark-estimation covariances under stable historical moments, and Holm adjustment addresses the family of tested observations. Neither procedure tests between-firm differences or establishes an electoral cause. The normal approximation is particularly restrictive for short windows, and inference remains sensitive to changing volatility, lag truncation, and first-order linearization. The risk-free benchmark input is held fixed. Short histories preclude tests for some complete CARs. The analysis does not estimate volatility or identify a political risk premium.

Future research could separate first-round and runoff events using short trading-day windows, compare the sample with private firms matched by sector and size, and distinguish ownership status at each event date. Alternative return benchmarks and inference procedures that account for common event dates would provide additional evidence on the stability of the findings. Measures of electoral surprises, expected policy changes, and

governance characteristics could help distinguish the mechanisms underlying the heterogeneous responses.

6 CONCLUSIONS

This study examined cumulative abnormal stock returns around Brazilian presidential elections from 1998 to 2022 for a historical sample of firms linked to federal ownership. The central finding is substantial variation across firms, elections, and horizons. Some cycles display broadly positive post-election values, whereas others contain marked differences in direction across firms. The evidence therefore favors a differentiated interpretation of electoral exposure over a uniform characterization of state-linked enterprises.

The comparison of 2018 and 2022 illustrates the descriptive result. All five observed firms in 2018 have positive post-election CARs. In 2022, four of six firms have positive values at +4w, while only BB Seguridade and Caixa Seguridade have positive values among the five complete +13w observations. Telebras has no complete +13w result in 2022. These differences demonstrate why any summary must specify both its firms and its horizon.

The contribution is a longitudinal account of electoral-period market outcomes with analytical tests of individual CARs, with particular attention to the variation visible in 2022. The evidence does not isolate the causal effect of the election, identify a stable partisan premium, or establish that state ownership causes greater sensitivity than private ownership. Within these limits, the findings clarify the importance of institutional context and firm-level heterogeneity in studying political risk in an emerging economy.

Fifteen of the 142 tested CARs have nominal p-values below .05. Telebras in the 2002 −13w window and Petrobras and Banco do Brasil in the short 2014 window remain significant after Holm adjustment at the 10% level, with adjusted p-values of 0.0095, 0.0015, and 0.0527, respectively. The two 2014 results depend especially on the normal approximation for a four-session window. The evidence supports departures from the historical benchmark in selected observations, while comparisons across firms and electoral cycles remain primarily descriptive.

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APPENDIX A

Exact inclusive event windows

Sessions are identified by observed Ibovespa prices. Labels are approximate horizons used in the study design.

Election	Window	Start (T_1)	End (T_2)	Sessions
1998	-13w	1998-07-06	1998-10-05	64
1998	-4w	1998-09-08	1998-10-05	20
1998	0	1998-10-01	1998-10-06	4
1998	+4w	1998-10-04	1998-11-02	19
1998	+13w	1998-10-04	1999-01-04	60
2002	-13w	2002-07-08	2002-10-07	65
2002	-4w	2002-09-09	2002-10-07	21
2002	0	2002-10-03	2002-10-08	4
2002	+4w	2002-10-06	2002-11-04	21
2002	+13w	2002-10-06	2003-01-06	61
2006	-13w	2006-07-03	2006-10-02	65
2006	-4w	2006-09-04	2006-10-02	20
2006	0	2006-09-29	2006-10-03	3
2006	+4w	2006-10-01	2006-10-30	20
2006	+13w	2006-10-01	2007-01-01	59
2010	-13w	2010-07-05	2010-10-04	64
2010	-4w	2010-09-06	2010-10-04	20
2010	0	2010-09-30	2010-10-05	4
2010	+4w	2010-10-03	2010-11-01	20
2010	+13w	2010-10-03	2011-01-03	61
2014	-13w	2014-07-07	2014-10-06	65
2014	-4w	2014-09-08	2014-10-06	21
2014	0	2014-10-02	2014-10-07	4
2014	+4w	2014-10-05	2014-11-03	21
2014	+13w	2014-10-05	2015-01-05	61
2018	-13w	2018-07-09	2018-10-08	64
2018	-4w	2018-09-10	2018-10-08	21
2018	0	2018-10-04	2018-10-09	4
2018	+4w	2018-10-07	2018-11-05	19
2018	+13w	2018-10-07	2019-01-07	58
2022	-13w	2022-07-04	2022-10-03	65
2022	-4w	2022-09-05	2022-10-03	20
2022	0	2022-09-29	2022-10-04	4
2022	+4w	2022-10-02	2022-10-31	20
2022	+13w	2022-10-02	2023-01-02	62

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APPENDIX B

Observation counts and coverage

Entries report the paired daily observations used to estimate beta over [T_1 − 365 calendar days, T_1]. Statistical tests require at least 60 calibration pairs and 60 contiguous reference observations, as specified in Section 3.5.

Election/window	BBAS3	BBSE3	CXSE3	ELET3	TELB4	PETR4	Market history
1998 -13w	60	0	0	60	0	60	60
1998 -4w	104	0	0	104	0	104	104
1998 0	121	0	0	121	8	121	121
1998 +4w	122	0	0	122	9	122	122
1998 +13w	122	0	0	122	9	122	122
2002 -13w	246	0	0	246	246	246	365
2002 -4w	247	0	0	247	247	247	365
2002 0	248	0	0	248	248	248	365
2002 +4w	246	0	0	246	246	246	365
2002 +13w	246	0	0	246	246	246	365
2006 -13w	249	0	0	249	249	249	365
2006 -4w	249	0	0	249	249	249	365
2006 0	250	0	0	250	250	250	365
2006 +4w	248	0	0	248	248	248	365
2006 +13w	248	0	0	248	248	248	365
2010 -13w	246	0	0	246	246	246	365
2010 -4w	246	0	0	246	246	246	365
2010 0	247	0	0	247	247	247	365
2010 +4w	245	0	0	245	245	245	365
2010 +13w	245	0	0	245	245	245	365
2014 -13w	247	247	0	247	247	247	365
2014 -4w	247	247	0	247	247	247	365
2014 0	248	248	0	248	248	248	365
2014 +4w	246	246	0	246	246	246	365
2014 +13w	246	246	0	246	246	246	365
2018 -13w	246	246	0	246	244	246	365
2018 -4w	246	246	0	246	240	246	365
2018 0	247	247	0	247	241	247	365
2018 +4w	245	245	0	245	239	245	365
2018 +13w	245	245	0	245	239	245	365
2022 -13w	249	249	249	249	247	249	365
2022 -4w	250	250	250	250	248	250	365
2022 0	251	251	251	251	249	251	365
2022 +4w	249	249	249	249	247	249	365
2022 +13w	249	249	249	249	247	249	365

Market history gives the number of index returns used to estimate the historical market mean, capped at 365. The following windows have incomplete event returns:

Election	Firm	Window	Observed / expected
1998	BBAS3	+13w	56 / 60
2014	TELB4	+13w	59 / 61
2018	TELB4	-13w	60 / 64
2022	TELB4	+13w	60 / 62

APPENDIX B.

Observation counts and coverage (continued)

Entries give the observed daily stock returns within each event window. The final column gives the index sessions defining the window. Zero indicates no observed stock return in that window.

Election/window	BBAS3	BBSE3	CXSE3	ELET3	TELB4	PETR4	Sessions
1998 / -13w	64	0	0	64	10	64	64
1998 / -4w	20	0	0	20	10	20	20
1998 / 0	4	0	0	4	4	4	4
1998 / +4w	19	0	0	19	19	19	19
1998 / +13w	56	0	0	60	60	60	60
2002 / -13w	65	0	0	65	65	65	65
2002 / -4w	21	0	0	21	21	21	21
2002 / 0	4	0	0	4	4	4	4
2002 / +4w	21	0	0	21	21	21	21
2002 / +13w	61	0	0	61	61	61	61
2006 / -13w	65	0	0	65	65	65	65
2006 / -4w	20	0	0	20	20	20	20
2006 / 0	3	0	0	3	3	3	3
2006 / +4w	20	0	0	20	20	20	20
2006 / +13w	59	0	0	59	59	59	59
2010 / -13w	64	0	0	64	64	64	64
2010 / -4w	20	0	0	20	20	20	20
2010 / 0	4	0	0	4	4	4	4
2010 / +4w	20	0	0	20	20	20	20
2010 / +13w	61	0	0	61	61	61	61
2014 / -13w	65	65	0	65	65	65	65
2014 / -4w	21	21	0	21	21	21	21
2014 / 0	4	4	0	4	4	4	4
2014 / +4w	21	21	0	21	21	21	21
2014 / +13w	61	61	0	61	59	61	61

Election/window	BBAS3	BBSE3	CXSE3	ELET3	TELB4	PETR4	Sessions
2018 / -13w	64	64	0	64	60	64	64
2018 / -4w	21	21	0	21	21	21	21
2018 / 0	4	4	0	4	4	4	4
2018 / +4w	19	19	0	19	19	19	19
2018 / +13w	58	58	0	58	58	58	58
2022 / -13w	65	65	65	65	65	65	65
2022 / -4w	20	20	20	20	20	20	20
2022 / 0	4	4	4	4	4	4	4
2022 / +4w	20	20	20	20	20	20	20
2022 / +13w	62	62	62	62	60	62	62

APPENDIX C

Analytical variance of cumulative abnormal returns

Let E, C, and H denote the event sessions, complete beta-calibration sessions, and sessions contributing to the historical market mean. Their sizes are L, N, and M. Let r_0 denote the fixed risk-free input, $\hat{m}$ the historical market mean, and $\hat{\beta}$ the slope of stock excess returns y on market excess returns x, with an intercept. Define $\hat{V}x = N^{-1}\,\Sigma C(x_t - \bar{x})^2$ and $\hat{d} = \hat{m} - r_0$.

The slope influence function, evaluated at the calibration estimates, is $\psi_t = [(x_t - \bar{x})(y_t - \bar{y}) - \hat{\beta}(x_t - \bar{x})^2]/\hat{V}x$. A first-order expansion represents the CAR deviation as a weighted sum of joint innovations $u_t = (R_{it}, R_{mt}, \psi_t)'$, centered at their reference means. Its time-specific weights are:

$$a_t = (1\{t \in E\}, -L\hat{\beta}\cdot 1\{t \in H\}/M, -L\hat{d}\cdot 1\{t \in C\}/N)'.$$

For covariance estimation, the joint innovations are centered at their reference-sample means. For the contiguous sequence of nR reference sessions, define $\hat{\Gamma}_k = nR^{-1}\,\Sigma_{t=k+1}^{nR} u_t u_{t-k}'$. With q = floor[4(nR/100)^(2/9)] and $b_k = 1 - k/(q + 1)$, the forecast variance estimate is:

$$\hat{V}(CAR) = \Sigma_t\, a_t'\hat{\Gamma}_0 a_t + 2\,\Sigma_{k=1}^{q}\, b_k\,\Sigma_t\, a_t'\hat{\Gamma}_k a_{t-k}.$$

Weights follow the observed index-session calendar. A date shared by calibration and the event contributes to both components of the same weight vector. The variance includes cross-covariances between event returns, the market mean, and beta estimation for pairs separated by up to q sessions. The common nR denominator and Bartlett taper yield a positive semidefinite covariance construction.

SE(CAR) = $\sqrt{\hat{V}}$(CAR), Z = CAR/SE(CAR), and p = 2Φ(−|Z|). These calculations use a first-order linearization and a normal approximation. Stable historical moments, weak dependence, and a suitable distributional approximation for the event sum are required. The procedure estimates predictive uncertainty under that model; it does not identify a causal election effect.

APPENDIX D

Two-sided p-values for cumulative abnormal returns

Entries are nominal p-values from the analytical tests in Section 3.5. *, **, *** indicate p < .10, .05, .01. Values below .0001 are displayed as <.0001. A dash indicates an unavailable test. The final column gives the number of estimated tests. Standard errors, adjusted p-values, and coverage reasons are provided in Supplementary Table S1.

Election/window	BBAS3	BBSE3	CXSE3	ELET3	TELB4	PETR4	Tests
1998 / -13w	—	—	—	—	—	—	0
1998 / -4w	0.9993	—	—	0.0383**	—	0.7100	3
1998 / 0	0.5831	—	—	0.4532	—	0.9003	3
1998 / +4w	0.8036	—	—	0.3112	—	0.1083	3
1998 / +13w	—	—	—	0.5364	—	0.2899	2
2002 / -13w	0.4817	—	—	0.1010	<.0001***	0.4665	4
2002 / -4w	0.5601	—	—	0.2696	0.2151	0.1888	4
2002 / 0	0.6963	—	—	0.7913	0.2535	0.9908	4
2002 / +4w	0.3429	—	—	0.0825*	0.2186	0.4920	4
2002 / +13w	0.4673	—	—	0.0864*	0.0033***	0.1596	4
2006 / -13w	0.8477	—	—	0.9507	0.6705	0.4327	4
2006 / -4w	0.8479	—	—	0.9120	0.6204	0.2862	4
2006 / 0	0.4726	—	—	0.1858	0.0949*	0.1656	4
2006 / +4w	0.6493	—	—	0.4130	0.8325	0.7804	4
2006 / +13w	0.2405	—	—	0.9980	0.5777	0.3078	4
2010 / -13w	0.3302	—	—	0.6315	0.7845	0.8577	4
2010 / -4w	0.1634	—	—	0.8662	0.9683	0.3753	4
2010 / 0	0.2640	—	—	0.1234	0.8019	0.5133	4
2010 / +4w	0.9434	—	—	0.3301	0.8552	0.4993	4
2010 / +13w	0.4854	—	—	0.9841	0.8078	0.6415	4
2014 / -13w	0.1824	0.9944	—	0.5089	0.6176	0.2403	5
2014 / -4w	0.1995	0.1725	—	0.4500	0.0686*	0.4265	5
2014 / 0	0.0004***	0.7811	—	0.0239**	0.0152**	<.0001***	5
2014 / +4w	0.4837	0.6448	—	0.8836	0.1643	0.1730	5
2014 / +13w	0.6641	0.5364	—	0.7326	—	0.0022***	4

Election/window	BBAS3	BBSE3	CXSE3	ELET3	TELB4	PETR4	Tests
2018 / -13w	0.1423	0.3094	—	0.2120	—	0.0990*	4
2018 / -4w	0.0067***	0.1912	—	0.0955*	—	0.0079***	4
2018 / 0	0.0139**	0.0213**	—	0.0030***	—	0.0276**	4
2018 / +4w	0.1097	0.1707	—	0.1343	—	0.2167	4
2018 / +13w	0.1897	0.3164	—	0.1908	—	0.8374	4
2022 / -13w	0.0585*	0.4343	0.1945	0.7909	—	0.0417**	5
2022 / -4w	0.8721	0.5550	0.8315	0.9143	—	0.7562	5
2022 / 0	0.5215	0.5417	0.8116	0.2359	0.4589	0.0879*	6
2022 / +4w	0.7910	0.1363	0.7278	0.0800*	0.6841	0.8212	6
2022 / +13w	0.5914	0.0897*	0.9596	0.8703	—	0.6509	5