

Review

Political uncertainty of impeachment upon corporate investment decisions

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Abstract

This study aims to verify if there is a negative relation between the investment of Brazilian companies and the impeachment of former president Dilma Rousseff. The period of analysis considers three previous (2013–2015) and subsequent (2016–2018) years to impeachment. As a result, although usually a process of impeachment provokes an environment of political instability, in the case of Brazil, the vice president, member of a center-right party, satisfied expectations of positive change. The impeachment represented loss of confidence in the political class, but also an anticipated turnaround of the country's economy. As a consequence, companies did not reduce their investments.

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1. Introduction

The re-democratization of Brazil occurred from the first direct election to president of the republic in 1985, after the end of the military regime. However, this process of consolidating democracy was not free from setbacks and challenges. Since then, the country has gone through two presidential impeachments that coincide with moments of economic and political imbalance, testing the resilience of its institutions (Green, 2019). The political crisis is a result of the loss of confidence in the parties and their representatives. Lack of credibility stems from the involvement of politicians in cases of corruption and their inability to implement reforms necessary for the country's development.

Former president Dilma Rousseff was accused of committing crimes of fiscal responsibility. The accusation also links her to Car Wash operation - triggered at Petrobrás - and to the

investigation of improper influence by former president Luiz Inácio Lula da Silva (Avritzer, 2017; Melo, 2016). In her first term (2011–2014), the country presented decreasing rates of Gross Domestic Product (GDP), changing to negative rates in 2015 (–3.55%) and 2016 (–3.31%). Given this scenario, on December 2, 2015, the chair of the lower house supported the request for impeachment. On August 31, 2016, Dilma Rousseff had her mandate revoked by a vote in the plenary of the federal senate. From then on, there is an alternation of parties in power, and GDP again has seen positive, but still low rates - 2017 (1.06%) and 2018 (1.12%) (Bacen, 2020a).

Since the last global financial crisis - which began in 2007 in the United States - Brazil has been implementing countercyclical policies to mitigate the effects of credit and demand shocks. Among the measures adopted are the National Treasury's contribution to the National Bank for Economic and Social Development (BNDES), which passed on to companies directly or through commercial banks (Ferraz & Coutinho, 2019). However, during the process of economic recovery, the impeachment of the former president takes place. According to Baker et al. (2016), events that amplify political uncertainty at the macroeconomic level are a harbinger of reduced investment and rising unemployment. For

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Kelly et al. (2016), it is understood by political uncertainty the indeterminacy of the future actions of the government.

In view of the above, this study aims to verify if there is a negative relation between the investment of the Brazilian companies and the impeachment of the former president Dilma Rousseff. In addition, it is intended to analyze the possible action of mitigating factors in their investment decisions in this period. Do those that have the highest returns on assets, have more cash and receive BNDES funds have their investments less affected? For this, a difference-in-difference (DID) test is applied. The final sample is comprised of 1722 observations or 287 Brazilian companies, of which 171 are publicly held and 116 are privately held. The period of analysis considers three previous years (2013–2015) and subsequent (2016–2018) to impeachment. Robustness tests are applied, including the lagged effect of the start of impeachment in 2017. The identification of companies with the mitigating characteristics mentioned occurs in 2015, in order to avoid that these variables are endogenous to the event.

Empirical studies highlight the relevance of the relationship between political uncertainty and corporate finance. Faced with scenarios of government instability, companies take measures to mitigate the adverse effect of a change in public administration, delaying or reducing their corporate decisions. There are studies that analyze the relationship between electoral processes and investment in organizations (An et al., 2016; Jens, 2017; Julio & Yook, 2012; Wang et al., 2014), as well as between dictatorial regimes and private investment (Albertus & Gay, 2019). Others verify the impact of the alternation of government representatives on company financing (Francis et al., 2014; Lv & Bai, 2019). In the case of Brazil, Hillier and Loncan (2019) evaluate the effect of political uncertainty on the market value of shares, from the leakage of a link between the president of the republic and an entrepreneur. However, to the best of our knowledge, there are no studies that evaluate the impact of the impeachment of former president Dilma Rousseff on the level of investment of Brazilian companies, including private ones.

The relevance of this analysis lies in understanding the impact of political uncertainty on a country's economy. The process of evolution of democracy must rely on a system of checks and balances that mitigates the negative effects of political instability on the real economy. In turn, despite the strength of the institutions, companies must take preventive measures to address market uncertainties and policies. The quality of the country governance - with control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and voice and accountability - are relevant factors in attracting international capital and in making investment decisions by companies.

As a result, despite the fact that an impeachment process provokes an environment of uncertainty and political instability, in the case of Brazil, the vice-president, who belongs to a center-right party, met market expectations. The impeachment represented the loss of confidence in the political class,

but also a positive turnaround for the country's economy. As a result, companies did not reduce their investments. High levels of cash reserve and financing granted by BNDES to companies in 2015 contributed to increase the company's investment.

2. Literature review

Brazil became an independent country in 1889. Its democratic trajectory has been interrupted several times thereafter. The first election, after military period starting in 1964, occurs in 1985. However, the full restoration of the democratic process occurred only in 1988, when the current federal constitution was enacted. Since then, two former presidents have been impeached - Fernando Collor de Mello in 1992 and Dilma Rousseff in 2016. Both were involved in corruption cases. In the case of Dilma Rousseff, the main argument for his resignation from the presidency is the disrespect to the law of fiscal responsibility, as well as her association with events revealed by the Car Wash operation. On this occasion, the country was going through a time of political and economic crisis.

The political crisis of Dilma Rousseff's government is related to two main aspects: a) collapse of the presidential coalition system associated with the rise of a conservative group in the national congress and b) crisis of representation expressed by the increase of illegal financing of campaigns and influence of money at the congress (Avritzer, 2017). Despite Brazil's rapid recovery from the contagion effect of the last global financial crisis in 2008, the years 2015 (−3.55%) and 2016 (−3.31%) show the worst growth in GDP over the last 20 years (World Bank, 2020b). According to Barbosa Filho (2017), in her government fiscal policy altered. The state committed to expansion through a New Economic Matrix (NEM). This implied exchange and price control, subsidies, greater tolerance to higher inflation, and still other measures. The adoption of NEM reduced the productivity of the Brazilian economy, with negative long-term consequences owing to poor investment decisions made by state agencies. In fact, between 2013 and 2018, there is a compound annual fall rate of 5,14% (World Bank, 2020c) of gross fixed capital formation or gross domestic fixed investment – see Fig. 1. The fall in both indicators affects domestic market, raising questions about the impact of the political crisis on all companies' investment level.

The relationship between politics and economics is a much discussed subject. Uncertainty arising from changes in government has real implications for business. Lv and Bai (2019) find that companies maintain low levels of indebtedness in a scenario of political uncertainty. Julio and Yook (2012) found that in election years, companies reduce their investment spending by 4.8% in relation to the other years. Xu et al. (2016) argue that political uncertainty offers companies a risk of losing connections already established between their executives and representatives of the government. This makes them more conservative in cash management. Jens (2017) identifies a 5% reduction of pre-election investment for business in general and 15% for those most susceptible to political

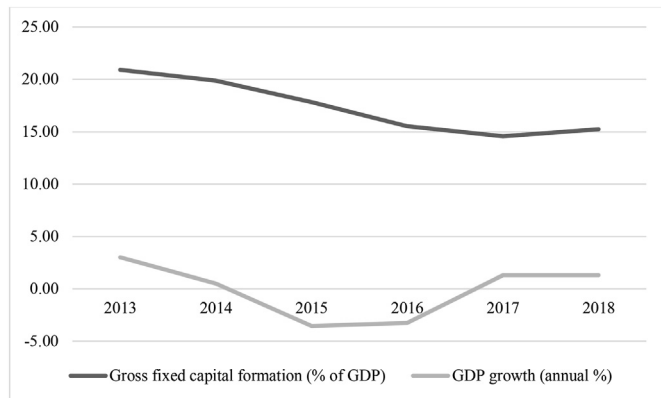


Fig. 1. Investment X GDP (%). Source: World Bank, 2020 b,c

uncertainty. Gulen and Ion (2016), An et al. (2016) and Nguyen and Phan (2017) also confirm the existence of a negative relationship between political uncertainty and investment. Companies tend to postpone their investment decisions, especially those that are irreversible, in a scenario of high political uncertainty. Finally, Heo and Yun (2018) discuss the relationship between the volatility of the South Korean market and the impeachment of its president. In view of the above, the first hypothesis is:

H1. In an impeachment process, companies reduce investment.

Duchin et al. (2010) and Kahle and Stulz (2013) find that uncertainty is a factor that causes a decrease in corporate investments. Moreover, Pastor and Veronesi (2013) argue that political uncertainty diminishes the return on assets and raises the cost of external financing, accentuating the financial difficulties of companies. However, Bo et al. (2014) point out that, in an environment of uncertainty, there are factors that mitigate the decrease in the level of investment of companies, such as profitability and capital gains. Campello et al. (2012) found that in an environment of unpredictability about the future - such as that of the last global financial crisis - larger, publicly-owned and profitable firms depended less on third-party capital than smaller firms. This fact contributed to the maintenance of their investment decisions in an environment of uncertainty. For Wang et al. (2014), a higher expectation of return on invested capital mitigates the adverse impact of uncertainty on corporate investment. Having said this:

H2. In an impeachment process, companies that have greater return on invested capital have investment less affected.

For Keynes (1936), companies retain cash for three reasons: financing current transactions, enabling future investment opportunities or preventing potential problems that require additional resources. Xu et al. (2016) find that in China, political uncertainty - motivated by the replacement of government representatives - causes a reduction in corporate cash. This strategy is consistent with the hypothesis of Caprio et al. (2013). They claim that companies protect their assets, not

keeping them in their most liquid form, to prevent them from being expropriated by politicians and bureaucrats. According to Chow et al. (2012), in China, political connections are a relevant instrument for the success of enterprises. For Hill et al. (2014), in the case of US companies, the greater their political connection via lobby or lower level of uncertainty, the lower their cash retention. Shiau et al. (2018) verified that in an environment of uncertainty - motivated by the last global financial crisis - companies increased their cash reserves, identifying a positive relation between liquidity and investments. For Phan et al. (2019), political uncertainty tends to be temporary. Thus, cash retention offers flexibility to companies, allowing the exploration of investment opportunities when uncertainty decreases. Thus, it can be stated that:

H3. In an impeachment process, companies with larger cash reserves have investment less affected.

BNDES was created in 1952 and still plays a relevant role in credit granting in Brazil. In the first phase, it concentrated on financing infrastructure projects. However, after the creation of state-owned companies, the bank started to invest in private enterprise and industrial projects. More recently, BNDES has returned to promoting the competitiveness of the Brazilian economy. According to Torres and Zeidan (2016), one of the main reasons for the bank's significant size is due to the historical underdevelopment of the Brazilian financial market. Until the beginning of the 21st century, the credit market in Brazil was characterized by an excess of scarcity, volatility, cost, concentration and segmentation. During the last global financial crisis, the country adopted anticyclical policies that included an increase in the granting of credit by federal banks. As of December 31, 2007, credit operations of financial institutions under government control totaled 34%. On 31 of August of 2016 - the date of the annulment of the term of office of former president Dilma Rousseff - its participation was 57%, remaining at 51% as of 31 of December of 2018 (Bacen, 2020b). According to Ferraz and Coutinho (2019), BNDES support for business investment during this period was fundamental for employment growth, modernization of the industrial park and expansion of goods and services. It is also worth noting that since the first term of former president Luiz Inácio Lula da Silva, BNDES has carried out large-scale operations to enable business combinations that established “national champions” in various sectors (Lazzarini et al., 2015). In view of the above, it can be said that:

H4. In an impeachment process, companies with BNDES financing have investment less affected.

3. Methodology

The sample is composed of 1722 observations for 287 Brazilian companies, of which 171 are publicly and 116 are privately held. All of them have total assets above US \$ 1 million and positive equity in all years of the sample. Financial companies (SIC 6000 to 6999) and public sector companies (SIC

9000 to 9999) are excluded. Industries are classified using the Standard Industrial Classification (SIC) codes with two digits. All continuous variables are winsorized between the 5th and 95th percentile in order to mitigate the effects of the outliers. The data of the companies are obtained from the base Capital IQ (CIQ), while the macroeconomic ones are obtained from bases of the Central Bank of Brazil and World Bank. Data related to BNDES debt dependency are collected manually from capital structure details provided by CIQ.

Appendix A presents a summary of the formulas and references in the literature of articles dealing with the variables of this study. However, some detail here will help. Regarding the investment dependent variables, two proxies are considered - capital expenditures (Capex) and fixed asset changes (FA). In addition, we have 2016 as the year of the effects of impeachment beginning. The sample analyzes the previous three years - 2013 to 2015 - and later - 2016 to 2018 - to measure the consequences. Besides the impeachment date of August 31st., 2016, the selection of this period is due to the GDP decreased between 2013 (3.00%) and 2015 (−3.55%) and its increase between 2016 (−3.31%) and 2018 (1.12%).

Additionally, a robustness test is performed for the periods 2015–2016 (pre) and 2017–2018 (post) with the intention of capturing a possible impaired effect of impeachment on the companies' investments. The years after impeachment (IMP) are identified with a dummy equal to one. In turn, the classification of companies with a high level of return on assets (ROA15), cash reserve (CAS15) and dependence on BNDES resources (BND15) occurs in 2015 to prevent it from being endogenous to impeachment.

As for the control variables of the company, all of them are lagged in a year to avoid simultaneity with the corporate investment, being: growth (GRO), leverage (LEV), cash flow (CF) and size (SIZ). An et al. (2016), Gulen and Ion (2016) and Benlemlih and Bitar (2018) identify a positive relationship between growth and investment perspectives. As for leverage, more indebted companies pay more interest and are less likely to raise more third-party capital. Both interest and principal debt reduce their ability to invest (Wang et al., 2014; An et al., 2016; Benlemlih & Bitar, 2018).

Cash flow is considered in the studies of Duchin et al. (2010) and Shiao et al. (2018) to control current investment opportunities, with an expectation of a positive future investments in long-term capital. In addition, for Xu et al. (2016) and Benlemlih and Bitar (2018), high cash flow volumes give companies greater investment incentives; however, this excess can lead them to problems of overinvestment, predicted in agency theory (Myers, 1977). With regard to size, it is possible to have a positive or negative relation with the investment. Larger companies have more choice of funding sources - access to the capital market, for example - so they invest more (Ghosal & Loungani, 2000). However, they may also have greater difficulties in identifying investment opportunities in the same proportion of their current assets (González, 2016).

The lagged variables of macroeconomic control are growth of the GDP and country governance. The GDP data is obtained from the base of the Central Bank of Brazil (Bacen, 2020a). A positive relationship between GDP and investment is expected (An et al., 2016; Jens, 2017; Julio & Yook, 2012). The country governance is measured by a proxy for global governance indicators (KKM), developed by a World Bank research group (Kaufmann et al., 2011). The index is derived from the average six-dimensional estimate - control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and voice and accountability. The estimate gives the country score, for each dimension, in units of a standard normal distribution, that is, varying approximately between −2.5 and 2.5. Thus, the higher, the better the index value. Data are obtained from the World Bank's Worldwide Governance Indicators database (World Bank, 2020a). A positive relationship between country governance and investment is expected (Tong et al., 2018).

Initially, the variables of this study are analyzed through descriptive statistics, correlation analysis and a mean difference test. The differences-in-differences (DID) test is then applied. According to Angrist and Pischke (2008), Roberts and Whited (2013), chap. 7 and Lee (2016), the DID is an instrument of analysis that uses time and group dimensions to control

Table 1

Descriptive statistics. Table 1 presents the descriptive statistic of the sample for the total period from 2013 to 2018. Capital expenditure (CAP) is the ratio between capital expenditures and total asset. Fixed asset (FA) is obtained by the ratio of gross property, plant and equipment and total asset. Return on asset in 2015 (ROA15) is the ratio between net operational profit after taxes (Nopat) and total assets. Cash reserve in 2015 (CAS15) is the ratio between (Cash + Short-term investments) and total asset. BNDES debt dependence in 2015 (BND15) is the ratio between BNDES debt and total asset. Growth (GRO) is ratio between $(Sales_t - Sales_{t-1})$ and $Sales_{t-1}$. Leverage (LEV) is the ratio between total debt and total asset. Cash flow (CF) is the ratio between earnings before interest, taxes, depreciation and amortization (Ebitda) and total asset. Size is natural logarithm of total asset. Gross domestic product growth (GDP) is the growth annual rate. Kaufmann Kraay and Mastruzzi index (KKM) is a value between −2.5 and 2.5. All control variables are lagged in one year.

Variables	Obs	Mean	Median	SD	Minimum	Maximum
CAP	1722	0.030	0.019	0.033	0.000	0.130
FA	1722	0.284	0.071	0.350	0.000	1.140
ROA15	1722	0.044	0.042	0.043	−0.022	0.148
CAS15	1722	0.118	0.090	0.106	0.006	0.401
BND15	1722	0.179	0.081	0.223	0.000	0.742
GRO	1722	−0.022	−0.022	0.214	−0.513	0.723
LEV	1722	0.304	0.311	0.197	0.001	0.686
CF	1722	0.099	0.099	0.072	−0.031	0.269
SIZ	1722	6.646	6.707	1.744	2.970	9.526
GDP	1722	−0.063	0.780	2.503	−3.550	3.000
KKM	1722	−0.073	−0.083	0.089	−0.195	0.064

Notes: Obs - number of observations; SD - Standard deviation.

Interpretation: Brazil presented negative GDP between the second quarter of 2014 and the fourth quarter of 2016 and lagged negative growth (−0.19%) between 2013 and 2018. This scenario is reflected in the low level of capital expenditures of companies, growth of sales and return on assets. The average level of indebtedness of companies is 30%, and in 2015 about 60% of this amount refers to debts with BNDES (18%), characterizing its high degree of dependence on government credit.

unobserved omitted variables. Both fixed effects and the DID are based on the assumption of omitted time-invariant variables and can be used to control endogeneity problems of omitted variables. Thus, possible problems of correlation between explanatory variables and the error term, associated to industries and firms, are controlled by the consideration of fixed effects and a set of dummy variables in the regression model. The corporate characteristics - high levels of return on assets, cash reserve and BNDES financing - are defined at the end of the year prior to the impeachment (2015), in order to mitigate problems of endogeneity. The political uncertainty caused by impeachment simultaneously affects everyone. Given this, it is assumed that differences between the characteristics of companies before the financial crisis are predetermined.

The hypotheses of this study are analyzed by means of Equation (1). A priori, only the effect of impeachment on the investment of the companies is evaluated. Subsequently, interaction variables are included individually. In addition to the dependent, explanatory and control variables, fixed-effect dummy variables are inserted to capture any heterogeneity resulting from omitted variables. The fixed effect of industry (λ_j) controls possible shocks in specific industries. The fixed effect of the firm (γ_i) controls for invariant characteristics not considered by the companies. The adjustments consider most factors affecting investment, thereby reducing possible problems of omitted variables.

$$\text{Inv}_{it} = \alpha_0 + \alpha_1 \text{Imp}_t + \alpha_2 (\text{Imp}_t * \text{IndVar15}_i) + \alpha_3 \text{Firm controls}_{it-1} + \alpha_4 \text{Macroeconomic controls}_{it-1} + \lambda_j + \gamma_i + \mu_{ijt} \quad (1)$$

In which:

Inv (corporate investment) = Capital expenditure and Fixed asset; Imp = Impeachment dummy; IndVar15 (Independent variables in the end of 2015) = Return on assets, Cash reserve and BNDES debt dependence; Firm controls = growth, leverage, cash flow, size; Macroeconomic controls = GDP growth, KKM index, i = firm; j = industry; t = year; λ_j = industry fixed effect; γ_i = firm fixed effect; μ_{ijt} = residuals.

4. Analysis of results

Table 1 shows that, on average, although fixed assets (FA) represent about 28% of total corporate assets, investments in new fixed assets for maintenance or business growth (CAP) are only 3%. Over the years of the sample, capital expenditure (CAP) decreased from 3.99% (2013) to 2.6% (2018) and increased gross fixed assets (FA) from 24.2% (2013) to 35% (2018). In addition, of the 287 companies, 59 (21%) did not have any investment (CAP and FA) in any of the years.

Between 2013 and 2018, the annual compound growth rate (CAGR) of GDP was -0.15% , while the sample average is -0.06% , which corroborates the low level of investment by companies. As for return on assets (ROA) in 2015, there are 48

(16%) companies with negative results. The cash reserve of companies in 2015 has a high standard deviation, ranging from 0.6% to 40%. As for debts with the BNDES in 2015, they represent about 60% (17.9%) of the average total corporate debt (30.4%). Sales growth (GRO) presented a negative average variation in the period (-2.2%). Meanwhile the cash flow (CF) has a mean and median of 10%. There is variation in the size (SIZ) of publicly traded and closed companies with a standard deviation of 1.74, being controlled by the definition of the sample of companies with total assets above US\$ 1 million. Regarding the global governance index (KKM), it presents negative values from 2013, with an average of -0.07 .

Finally, on the industry classifications, 51 two-digit SIC codes are identified. Code 49 (electric, gas and sanitary services) represents 25% and another 12 codes represent 42% of the sample. The remaining 38 codes represent less than 2% individually. Thus, there is a concentration of the Brazilian market in 13 types of activities - electric, gas and sanitary services (49); transportation services (47); business services (73); food and kindred products (20); industrial and commercial machinery and computer equipment (35); chemicals and allied products (28); paper and allied products (26); wholesale trade - nondurable goods (51); textile mill products (22); communications (48); heavy construction, except building construction, contractor (18); primary metal industries (33); general merchandise stores (53).

Table 2 presents the level of correlation and statistical significance between the variables of Equation (1). As expected, capital expenditure (CAP) and fixed asset (FA) show a positive relation. However, a larger cash reserve in 2015 (CAS15) does not mitigate the reduction of investments of companies, contrary to H3 - *In an impeachment process, companies with greater cash reserves have investment less affected*. The ratio of debt to the BNDES in 2015 (BND15) and capital expenditure (CAP) is positive. This is in line with H4 - *In an impeachment process, companies with BNDES financing have investment less affected*. Regarding company control variables and macroeconomic variables, there is a positive relationship between all of them and investment proxies, as expected - except for FA and KKM. The negative relation between cash reserve (CAS15) and BNDES (BND15) debts in 2015 and leverage (LEV), confirming the pecking order theory. In the hierarchy of funding sources, there is a preference for domestic resources, debt and equity (Myers, 1984). Finally, the high positive correlation (59%) between GDP and the regulatory environment (KKM) stands out, confirming the fact that an improvement in the country's quality of governance is related to its economic growth.

Table 3 shows the mean difference of the companies' investment - via capital expenditure proxies (CAP) and fixed assets (FA) - before and after impeachment. For the total sample, there is a reduction of capital expenditures and an increase in property, plant and equipment after the occurrence of the exogenous event. This result is maintained for the subsamples of companies with high and low levels of return on assets (ROA), cash reserve (CAS)

Table 2

Correlation test. Table 2 shows the correlation between the variables, whose data are obtained between 2013 and 2018. Capital expenditure (CAP) is the ratio between capital expenditures and total asset. Fixed asset (FA) is obtained by the ratio of gross property, plant and equipment and total asset. Return on asset in 2015 (ROA15) is the ratio between net operational profit after taxes (Nopat) and total assets. Cash reserve in 2015 (CAS15) is the ratio between (Cash + Short-term investments) and total asset. BNDES debt dependence in 2015 (BND15) is the ratio between BNDES debt and total asset. Growth (GRO) is ratio between $(Sales_t - Sales_{t-1})$ and Sales in t-1. Leverage (LEV) is the ratio between total debt and total asset. Cash flow (CF) is the ratio between earnings before interest, taxes, depreciation and amortization (Ebitda) and total asset. Size is natural logarithm of total asset. Gross domestic product growth (GDP) is the growth annual rate. Kaufmann Kraay and Mastruzzi index (KKM) is a value between -2.5 and 2.5. All control variables are lagged in one year.

Variables	CAP	FA	ROA 15	CAS 15	BND 15	GRO	LEV	CF	SIZ	GDP	KKM
CAP	1										
FA	0.301 [0.00]	1									
ROA15	0.008 [0.72]	0.017 [0.47]	1								
CAS15	-0.059 [0.01]	-0.058 [0.01]	-0.053 [0.02]	1							
BND15	0.072 [0.00]	0.037 [0.12]	-0.008 [0.71]	-0.104 [0.00]	1						
GRO	0.054 [0.02]	-0.003 [0.90]	0.011 [0.62]	-0.038 [0.11]	0.019 [0.41]	1					
LEV	0.027 [0.26]	0.069 [0.00]	0.050 [0.03]	-0.112 [0.00]	0.040 [0.09]	0.027 [0.24]	1				
CF	0.209 [0.00]	0.087 [0.00]	-0.016 [0.48]	-0.081 [0.00]	0.037 [0.11]	0.161 [0.00]	0.199 [0.00]	1			
SIZ	0.094 [0.00]	0.050 [0.03]	0.045 [0.05]	-0.103 [0.00]	0.068 [0.00]	0.084 [0.00]	0.401 [0.00]	0.179 [0.00]	1		
GDP	0.121 [0.00]	-0.012 [0.60]	0.000 [1.00]	-0.000 [1.00]	0.000 [1.00]	-0.382 [0.00]	0.016 [0.49]	0.044 [0.06]	0.013 [0.56]	1	
KKM	0.151 [0.00]	-0.082 [0.00]	0.000 [1.00]	-0.000 [1.00]	0.000 [1.00]	-0.228 [0.00]	0.023 [0.33]	0.039 [0.10]	0.019 [0.41]	0.591 [0.00]	1

Notes: The upper or left value is the correlation coefficient, while the lower or right value [in brackets] is the level of significance.

Interpretation: The positive relationship between capital expenditures and debts contracted with the BNDES in 2015 is in accordance to H4: *In an impeachment process, companies with BNDES financing have their investments less affected*. In addition, there is a positive relationship for most of the companies and macroeconomic control variables and the investment proxies, as expected. Finally, there is a positive relationship between economic growth and an improvement in the country's regulatory environment.

and debt dependence of BNDES (BND). In other words, these specific characteristics do not discriminate the corporate level of investment after impeachment. Thus, according to the mean difference test, both corporate decisions and government countercyclical policies do not have the expected effects on the market.

The DID differs from the paired means difference test before and after (BA). BA compares the same company before and after an event to identify the effect. However, over the time of the analysis, it is possible that another factor will change the level of

investment of the company, not necessarily impeachment. This problem can be overcome if the treatment is applied at a time only to the qualified group - companies that have the highest return on invested capital, cash reserve and BNDES financing, while the control group is not treated. In analyzing the two groups, changes in explanatory variables are not relevant because they can be controlled (Lee, 2016).

Fig. 2 shows a decrease (increase) in CAP (FA) investments for sample companies between 2013 and 2018. For CAP, there

Table 3

Mean difference test. Table 3 presents the paired-mean differences for firm's investment variables capital expenditure (CAP) and fixed asset (FA) considering the previous (2013–2015 or Imp = 0) and subsequent (2016–2018 or Imp = 1) periods to the Brazilian impeachment (Imp). The subsamples of high (low) values for return on assets, internal finance and BNDES debt dependence are those above (below or equal) the median in 2015.

Description	No. Obs	Capital expenditure (CAP)			Fixed asset (FA)		
		Imp = 1	Imp = 0	Dif	Imp = 1	Imp = 0	Dif
Total sample	861	0.025	0.035	-0.010 ***	0.307	0.261	0.046 ***
Firms with high return on assets	426	0.025	0.034	-0.009 ***	0.294	0.242	0.052 ***
Firms with low return on assets	435	0.026	0.036	-0.010 ***	0.320	0.279	0.041 ***
Firms with high cash reserve	426	0.026	0.035	-0.008 ***	0.311	0.257	0.054 ***
Firms with low cash reserve	435	0.025	0.036	-0.010 ***	0.304	0.264	0.039 **
Firms with high BNDES debt dependence	429	0.031	0.043	-0.012 ***	0.327	0.273	0.053 ***
Firms with low BNDES debt dependence	432	0.020	0.028	-0.007 ***	0.288	0.249	0.039 **

Notes: Imp = Impeachment; Dif = Difference of means; Obs = Observation; Levels of significance of 1% (***) and 5% (**).

Interpretation: There is a reduction in capital expenditures and an increase in fixed asset after impeachment, regardless the characteristics of results, liquidity and dependence on BNDES financing by companies.

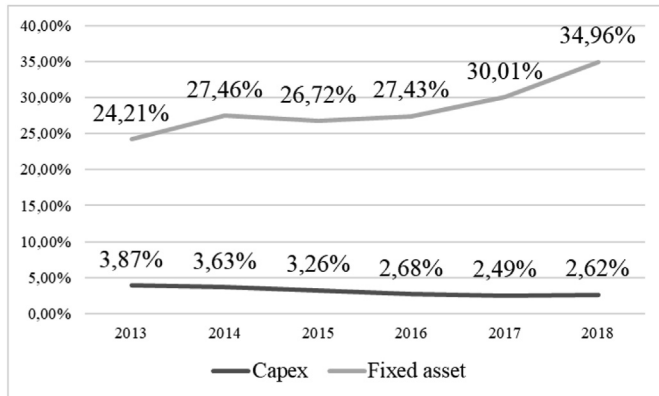


Fig. 2. Investment growth (%).

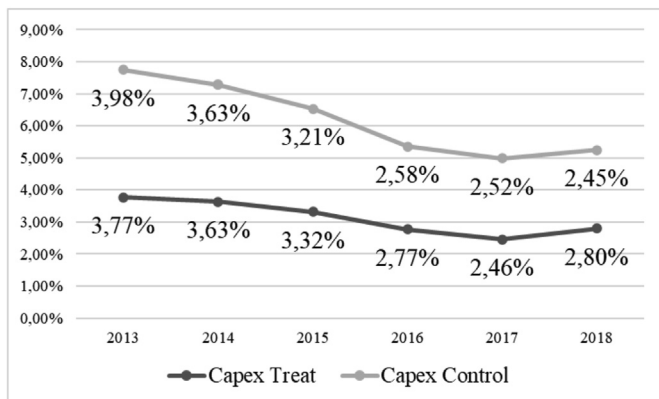


Fig. 3. CAP/CAS (%).

is a compound annual fall rate of 6.3%. As for FA, contrary to expectations, there is an increase of 6,31%. Moreover, Figs. 3–5 present the investment behavior for the CAP and FA proxies, considering the treatment (above the median) and control (equal or below the median) groups of companies with high (low) ROA, CAS and BND financing in 2015, respectively. Fig. 3 indicates that, for the treatment group (−4,84%), the compound annual fall rate in CAP/CAS is smaller than for the control group (−7,76%), confirming the results in Table 4

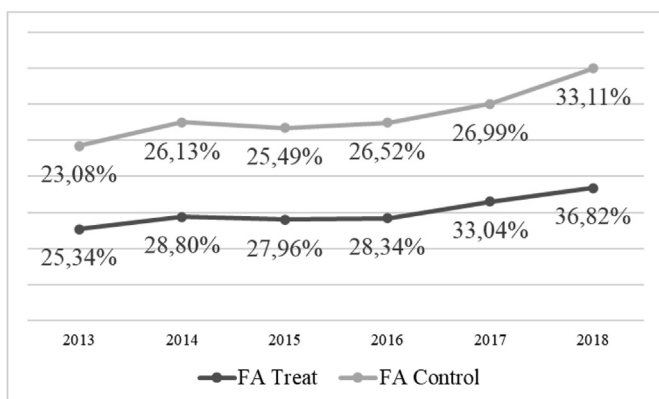


Fig. 4. FA/BND (%).

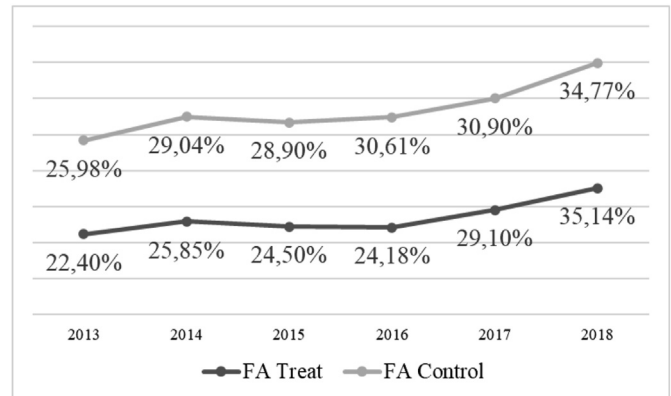


Fig. 5. FA/ROA (%).

(H3). Fig. 4 points that the compound annual growth rate in FA/BND is greater for the treatment group (6,42%) than for the control group (6,19%), ratifying the results of Table 5 (H4). Finally, Fig. 5 shows that, for the treatment group (7,8%), there is a higher compound annual growth rate in FA/

Table 4

Changes in capital expenditure (CAP). Table 4 presents the results of the DID tests. The dependent variable investment is represented by capital expenditure (CAP). In model 1, only impeachment (IMP) is considered. In model 2, it is added the interaction between impeachment and return on assets in 2015 (IMP*ROA15). In model 3, it is added the interaction between impeachment and cash reserve in 2015 (IMP*CAS15). In model 4, it is added the interaction between impeachment and BNDES debt dependence in 2015 (IMP*BND15). Corporate and macroeconomic control variables are lagged in one year (t-1). Growth (GRO) is ratio between $(Sales_t - Sales_{t-1})$ and $Sales_{t-1}$. Leverage (LEV) is the ratio between total debt and total asset. Cash flow (CF) is the ratio between earnings before interest, taxes, depreciation and amortization (Ebitda) and total asset. Size is natural logarithm of total asset. Gross domestic product growth (GDP) is the growth annual rate. Kaufmann Kraay and Mastruzzi index (KKM) is a value between −2.5 and 2.5. All control variables are lagged in one year. Industry and firm-specific effects dummies are considered in the models; however, their coefficients are not presented. This adjustment allows the obtainment of robust estimates of variance.

Variables/Models	(1)	(2)	(3)	(4)
IMP	0.002	0.001	0.000	0.003
IMP*ROA15		0.006		
IMP*CAS15			0.015*	
IMP*BND15				−0.005
GRO _{t-1}	0.002	0.002	0.002	0.002
LEV _{t-1}	−0.013*	−0.013*	−0.013*	−0.013*
CF _{t-1}	0.031**	0.031**	0.034***	0.031**
SIZ _{t-1}	−0.005***	−0.005***	−0.005**	−0.005**
GDP _{t-1}	0.001***	0.001***	0.001***	0.001***
KKM _{t-1}	0.056***	0.056***	0.057***	0.056***
Industry fixed effect	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
R ²	0.001	0.001	0.001	0.001
F	0.000	0.000	0.000	0.000
# Observations	1722	1722	1722	1722

Notes: significance levels of 1% (***), 5% (**) and 10% (*).

Interpretation: Impeachment has not led to a reduction in corporate investment in general. However, those with larger cash reserves had their investments less affected.

Table 5

Changes in fixed asset (FA). Table 5 presents the results of the DID tests. The dependent variable investment is represented by fixed asset (FA). In model 1, only impeachment (IMP) is considered. In model 2, it is added the interaction between impeachment and return on assets in 2015 (IMP*ROA15). In model 3, it is added the interaction between impeachment and cash reserve in 2015 (IMP*CAS15). In model 4, it is added the interaction between impeachment and BNDES debt dependence in 2015 (IMP*BND15). Corporate and macroeconomic control variables are lagged in one year (t-1). Growth (GRO) is ratio between $(Sales_t - Sales_{t-1})$ and $Sales_{t-1}$. Leverage (LEV) is the ratio between total debt and total asset. Cash flow (CF) is the ratio between earnings before interest, taxes, depreciation and amortization (Ebitda) and total asset. Size is natural logarithm of total asset. Gross domestic product growth (GDP) is the growth annual rate. Kaufmann Kraay and Mastruzzi index (KKM) is a value between -2.5 and 2.5. All control variables are lagged in one year. Industry and firm-specific effects dummies are considered in the models; however, their coefficients are not presented. This adjustment allows the obtainment of robust estimates of variance.

Variables/Models	(1)	(2)	(3)	(4)
IMP	0.089**	0.090**	0.091**	0.078**
IMP*ROA15		-0.002		
IMP*CAS15			-0.011	
IMP*BND15				0.076**
GRO _{t-1}	-0.004	-0.004	-0.004	-0.004
LEV _{t-1}	0.113	0.113	0.113	0.115
CF _{t-1}	0.075	0.075	0.073	0.083
SIZ _{t-1}	-0.106***	-0.106***	-0.106***	-0.109***
GDP _{t-1}	0.013***	0.013***	0.013***	0.013***
KKM _{t-1}	-0.053	-0.053	-0.053	-0.044
Industry fixed effect	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
R ²	0.001	0.001	0.001	0.001
F	0.000	0.000	0.000	0.000
# Observations	1722	1722	1722	1722

Notes: significance levels of 1% (***), 5% (**) and 10% (*).

Interpretation: In the years after the impeachment, there is an increase in the fixed assets of the firms in general, being more pronounced for the ones that had dependence on BNDES funds in 2015. This fact confirms the relevance of BNDES's role in the government's anticyclical credit policy.

ROA than for the control group (4,98%), in accordance with the results of Table 6 (H2).

Table 4 presents the DID test for the capital expenditure investment (CAP) proxy. This variable differs from the fixed asset proxy (FA) by including capital expenditures in discontinued operations, investments in software intensive projects and other intangible assets, and the exclusion of investment in real estate assets. Model 1 indicates that the impeachment event did not reduce the level of capital expenditures of the companies in general, contrary to H1. However, model 3 confirms the fact that in the post-impeachment years (2016–2018), firms with larger cash reserves had their investments less affected, confirming H3. With every 1% increase in the company's cash reserve, there is a 0.015% increase in corporate capital expenditures, after the impeachment period. This result corroborates that of Wang et al. (2014) that verify that in an economic environment of political uncertainty, companies that use more internal resources have their investments less affected.

Corporate control variables present results according to the mentioned theories, with the exception of sales growth. According to González (2016), larger firms may have more difficulty identifying investment opportunities in the same proportion of their current assets, which suggests a negative relation between size and investment. As for macroeconomic control variables, there is a positive relationship between capital expenditures and GDP growth, as well as the country's governance index (KKM), which includes the dimensions of control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and voice and accountability.

Table 5 presents the DID test for the fixed asset investment (FA) proxy. Unlike the capital expenditure variable (CAP), gross fixed assets do not capture investments in intangible assets and include real estate investments. According to model 1, there is an increase in gross fixed assets (FA) in the post-impeachment years (2016–2018) for companies in general, as opposed to H1. Model 4 indicates that this increase occurs mainly for companies that had dependence on BNDES resources in 2015, confirming H4. A 1% increase in debts contracted with the BNDES raises the fixed assets of these companies by 0.076%. This result corroborates the study by Ferraz and Coutinho (2019) that, after the last global financial crisis, the BNDES plays a fundamental role in the counter-cyclical policy of the Brazilian government. In fact, between 2007 and 2015, BNDES finances 13.5% of the total fixed assets investments in the country. For them, the role of development banks is to support companies' long-term investments, anticipating the recovery cycles, dealing with market uncertainties and failures.

Table 6 presents robustness tests for Equation (1). In models 1 and 3, the exclusion of the industry effect does not change the results presented in Tables 4 and 5, respectively. In fact, there is a concentration of the sample in 13 SIC codes, representing about 42% of the total companies. Among them, the activity of electric, gas and sanitary services (SIC 49) is equivalent to 25% of the 287 companies. Models 2 and 4 consider the lagged effect of impeachment (2017–2018) on corporate investment. Model 2 indicates that the greatest impact of impeachment on corporate investment occurs in 2016, given the insignificance of variables, with the exception of macroeconomic variables. In fact, there is a recovery of the economy between 2017 and 2018 - see growth of 1.12% of GDP, after the recession of the years 2015 and 2016 which is characterized by a fall in GDP of 3.31% (Bacen, 2020a). The model 4 indicates that the improvement of the economy is reflected in the investment of the companies. A 1% increase in return on assets in 2015 (IMP * ROA15) causes a 0.471% increase in fixed assets (FA). In addition, it highlights the even more relevant role of BNDES financing in this period. A 1% increase in debts contracted with the BNDES in 2015 (IMP * BND15) increases the fixed assets (FA) of these companies by 0.097%. Finally, it is important to emphasize the positive

Table 6

Robustness tests on changes in investment after the impeachment. In models 1 and 2, the dependent variable is capital expenditure (CAP), while in models 3 and 4 is fixed asset (FA). Models 1 and 3 consider the period from 2013 to 2015 to be pre-impeachment and from 2016 to 2018 as the post-impeachment period. Models 2 and 4 consider the period of 2015 and 2016 to be pre-impeachment and of 2017 and 2018 as the post-impeachment period. Impeachment (IMP) is a dummy variable, being 0 for the years before impeachment and 1 after it. IMP*ROA15 is an interaction between impeachment and return on asset in 2015. IMP*CAS15 is an interaction between impeachment and cash reserve in 2015. IMP*BND15 is an interaction between impeachment and BNDES debt dependence in 2015. Corporate and macroeconomic control variables are lagged in one year (t-1). Growth (GRO) is ratio between $(Sales_t - Sales_{t-1})$ and $Sales_{t-1}$. Leverage (LEV) is the ratio between total debt and total asset. Cash flow (CF) is the ratio between earnings before interest, taxes, depreciation and amortization (Ebitda) and total asset. Size is natural logarithm of total asset. Gross domestic product growth (GDP) is the growth annual rate. Kaufmann Kraay and Mastruzzi index (KKM) is a value between -2.5 and 2.5. All control variables are lagged in one year. Industry and firm-specific effects dummies are considered as indicated; however, their coefficients are not presented.

Variables	Capital Expenditure (CAP)		Fixed Asset (FA)	
	Without industry effect	Impeachment period 2017–2018	Without industry effect	Impeachment period 2017–2018
	(1)	(2)	(3)	(4)
IMP	0.001	−0.001	0.077**	−0.010
IMP*ROA15	0.007	−0.013	0.001	0.471**
IMP*CAS15	0.014*	0.006	0.006	−0.012
IMP*BND15	−0.004	0.001	0.077**	0.097**
GRO _{t-1}	0.002	0.002	−0.004	−0.001
LEV _{t-1}	−0.013*	−0.010	0.115	0.112
CF _{t-1}	0.033***	−0.002	0.084	−0.052
SIZ _{t-1}	−0.005**	−0.001	−0.109***	−0.115***
GDP _{t-1}	0.001***	0.001***	0.013***	0.003***
KKM _{t-1}	0.056***	0.037***	−0.044	−0.497***
Industry fixed effect	No	Yes	No	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
R ²	0.001	0.001	0.001	0.001
F	0.000	0.000	0.000	0.000
# Observations	1722	1148	1722	1148

Notes: Levels of significance of 1% (***), 5% (**) and 10% (*).

Interpretation: In models 1 and 3, the exclusion of the industry effect does not change the results presented in Tables 4 and 5, respectively, since there is a concentration of the activities of the companies. Models 2 and 4 confirms that the greatest impact of impeachment occurs in 2016, with a recovery of the economy in 2017 and 2018. Model 4 indicates that the improvement of the economy is also observed in firms, confirming that in an impeachment process, companies that have a greater return on asset (H2) and BNDES financing (H4) have their investments less affected.

(negative) relationship between the lagged macroeconomic variables GDP (KKM) and fixed assets (FA) of model 4. Despite the improvement in the economy in the years 2017 and 2018, there is a perception of worsening corruption control and other governance indicators of the country.

5. Conclusion

The relationship between politics and economics is the subject of recurrent studies in finance due to the influence of government decisions on business management. The effects of political uncertainty are even more relevant after the instability triggered by the last global financial crisis, which began in 2007 in the United States. In the case of Brazil, initially, the fiscal policy adopted in response to the crisis was limited, compared to other countries. However, Brazil innovated by granting considerable amounts of credit to public banks financed by bonds issued by the National Treasury.

After 2011, there is a greater intervention by the government, through the adoption of a new economic matrix. That involved the reduction of the interest rate, increase of expenditures and cancelation of taxes, as well as by granting of subsidies. In

addition, the role of the BNDES was enhanced by a policy aimed at the establishment of national champions and the choice of strategic sectors for subsidies. As of 2012, the country shows successive declines in GDP, showing negative growth in 2015 and 2016. In this scenario of recession, former president Dilma Rousseff was accused of committing crimes of fiscal irresponsibility and administrative incompetence. As a consequence, her impeachment process began on December 2, 2015, and her term was revoked on August 31, 2016.

The political instability inherent in this process presents a scenario of uncertainties that impacts corporate decisions. Thus, this study aimed to examine whether there is a negative relationship between the investment of Brazilian companies and the impeachment of former president Dilma Rousseff. In addition, it is intended to verify if some additional factors can impede a reduction in the investment of the companies. This highlights the positive effects of greater return on assets, cash reserves and BNDES financing.

For this purpose, a DID test is applied on a sample composed of 1722 observations of 287 Brazilian companies, of which 171 are publicly-held and 116 are privately-owned. The period prior to impeachment is considered as the period

from 2013 to 2015, with consequences occurring between 2016 and 2018. Robustness tests are applied, including the lagged effect of the start of impeachment in 2017. The identification of companies with mitigating characteristics mentioned in 2015, in order to avoid that these variables are endogenous to the event.

As a result, initially the mean difference test - see Table 3 - points to a reduction (increase) in capital expenditure (fixed assets) investment proxies after the impeachment period (2016–2018). However, the DID test indicates that there is no reduction in the investments of Brazilian companies, for the capital expenditure proxy (CAP) - see Table 4. In the case of the fixed assets proxy (FA), there is an increase (see Table 5). This fact differs from other empirical studies that analyze the impact of political uncertainty - motivated by electoral processes and/or alternation of government representatives - in the investment of organizations (An et al., 2016; Jens, 2017; Julio & Yook, 2012; Wang et al., 2014).

The lack of proof of H1 - *In a process of impeachment, companies reduce investment* may be related to the fact that the impeachment process in Brazil increased political stability. Dilma Rousseff's vice president Michel Temer belongs to a center-right-wing party, and had been critical of the administration before impeachment occurred. The economic performance of a country - as measured by GDP - can be explained both by the international scenario and by internal government failures. In 2015, total world GDP grew 2.59%, and per capita, 1.39%. Brazil's GDP declined -3.31%, and per capita, -4.09%. (World Bank, 2020b). The recession of this period is mainly associated with the ineptitude of the Dilma Rousseff government.

On the other hand, there is a confirmation of the H3 - *In an impeachment process, companies with larger cash reserves have investment less affected* - see Table 4. The positive and significant coefficient of the interaction variable $IMP * CAS15$ indicates that companies that had higher cash reserves in 2015 have more capital expenditure (CAP) investment, after impeachment, than those that did not have this characteristic. This result is in line with that obtained by Wang et al. (2014) and confirms Keynes's (1936) reasons for speculation and precaution for cash retention. Companies opt to retain cash to enable investment opportunities and obtain liquidity necessary for possible future difficulties.

Table 5 shows the relevance of BNDES financing. Companies that had BNDES funds in 2015, after impeachment, increased investments in fixed assets (FA). This fact confirms H4 - *In an impeachment process, companies with BNDES financing have investment less affected*. According to the Central Bank of Brazil, the balance of credit operations of financial institutions under public control increases from 44% to 56% between 2011 and 2015 (Bacen, 2020b). For Bonomo et al. (2015) and Ferraz and Coutinho (2019), government-sponsored credit played an important role in the country's countercyclical economic recovery policy since the global financial crisis of 2007.

In turn, Table 6 shows the results of the robustness tests. The scenario considering the lagged effect of the

impeachment (2017–2018) on companies' capital expenditure (CAP) indicates that its greatest impact occurs in 2016. There is non-significance of the variables and economic improvement. However, in the case of investments in fixed assets (FA), it can be seen that companies that had better return on asset and BNDES financing increase their investments. These facts corroborate H2 - *In an impeachment process, companies that have higher returns on invested capital have investment less affected* and H4 - *In an impeachment process, companies with BNDES financing have investment less affected*.

As for the control variables of the company, they present statistical significance and relate as expected with the capital expenditure investment (CAP) proxy. Regarding the macroeconomic control variables, we highlight the alignment between investment and economic improvement (GDP), post impeachment, despite the perception of deterioration in the control of corruption, among other governance indicators (KKM). In short, the impeachment of former president Dilma Rousseff represented loss of confidence in the political class, but also a positive turnaround for the country's economy, contrary to expectations for political uncertainty in other country cases.

This study stands out from the others because it is, to our knowledge, the first to analyze the impact of the impeachment of 2016 on the investment of Brazilian companies. Previous studies verify the relationship between politics and economics in environments of political uncertainty provoked by electoral processes and other forms of substitution of governments. Understanding these aspects contributes to the consolidation of democratic institutions and the implementation of countercyclical government policies. For companies, identifying mitigating factors to the effects of impeachment can assist them in their corporate decisions in environments of political and economic instability. For purposes of future analysis, the relationship between the performance of the economy and the installation of impeachment processes can be extended. Possible predictive models for both governments and the market, and their interaction, can be undertaken.

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Conflict of interest

The authors certify that we have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

Appendix A. Description of variables

Initial	SE	Name	Formula	Reference	Source
Dependent variables - Investment					
CAP	n/a	Capital expenditure	CAP = Capital expenditures/Total asset	Julio and Yook (2012), Wang et al. (2014), Gulen and Ion (2016), Jens (2017)	CIQ
FA	n/a	Fixed asset	FA = Gross property, plant & equipment/Total asset	An et al. (2016), Gulen and Ion (2016), Lv and Bai (2019)	CIQ
Exogenous variable - Impeachment					
IMP	—	Impeachment	IMP = dummy, being 1 if between 2016 and 2018 and 0 if between 2013 and 2015	Heo and Yun (2018), Hillier and Loncan (2019)	n/a
Independent variables					
ROA15	+	Return on asset in 2015	ROA15 = Nopat/Total asset Nopat = Ebit x (1 – tax rate) Tax rate = 34%	Wang et al. (2014), Lv and Bai (2019)	CIQ
CAS15	+	Cash reserve in 2015	CAS15 = (Cash + Short-term investments)/Total asset	Wang et al. (2014), An et al. (2016), Xu et al. (2016)	CIQ
BND15	+	BNDES debt dependence in 2015	BND15 = BNDES debt/Total asset	Bonomo et al. (2015)	CIQ
Firm control variables					
GRO	+	Growth	GRO = (Sales _t – Sales _{t-1})/Sales _{t-1}	An et al. (2016), Gulen and Ion (2016), Lv and Bai (2019)	CIQ
LEV	—	Leverage	LEV = Total debt/Total asset	Julio and Yook (2012), Wang et al. (2014), An et al. (2016), Jens (2017), Lv and Bai (2019)	CIQ
CF	+	Cash flow	CF = Ebitda/Total asset	Julio and Yook (2012), Wang et al. (2014), Xu et al. (2016)	CIQ
SIZ	+ or -	Size	SIZ = Ln (Total asset)	Julio and Yook (2012), Wang et al. (2014), An et al. (2016)	CIQ
Macroeconomic controls variables					
GDP	+	Gross domestic product growth	GDP = Gross domestic product annual growth rate	Julio and Yook (2012), An et al. (2016), Jens (2017)	Central Bank of Brazil
KKM	+	Kaufmann Kraay and Mastruzzi index	KKM = It varies between –2.5 and 2.5. The higher the regulatory environment index, the better	Kirch and Terra (2012); González (2015)	World Bank

Notes: n/a = not applicable; SE = standard error; CIQ = Capital IQ.

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