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Governmental Effectiveness: Analysis of State-Owned Enterprises Investments

ABSTRACT

Objective: analyze the relationship between the effectiveness of the government and the investments made by state-owned enterprises.

Method: this study makes use of a quasi-experiment using the Difference-in-Differences technique. The variables used to analyze the investments were: Increase in Investments, Number of Employees, Intangible Assets, Short-Term Investment and Return on Investments.

Originality/Relevance: little attention was paid to comparisons between countries regarding government effectiveness, and no studies addressing the relationship between government effectiveness and state-owned enterprise investments were found.

Results: companies with the government as the majority shareholder only invest more in relation to private companies when they are in environments with low government effectiveness.

Theoretical/Methodological contributions: in theoretical terms, the research addressed a new perspective that may be crucial in explaining state-owned enterprise investments: the effectiveness of government. The main methodological contribution was the use of a comparative study on government effectiveness (in terms of using multiple measures and the analysis of many countries).

Keywords: Government Effectiveness; Investments; State-Owned Enterprises.

Elias Pereira Lopes Júnior

Universidade Federal do Cariri, Ceará, Brasil
E-mail: elias.junior@ufca.edu.br

Pedro Igor de Sousa Damasceno

Universidade Federal da Paraíba, Paraíba,
Brasil
E-mail: pedroigordamasceno.adm@gmail.com

Rodolfo Jakov Saraiva Lôbo

Universidade Federal do Cariri, Ceará, Brasil
E-mail: rodolfo.jakov@ufca.edu.br

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1 INTRODUCTION

In recent years, questions about government performance (at country level) have been addressed internationally (Alam, Kitenge & Bedane, 2017; Best & Burke, 2017; Boyne, 2003; Boyne, Meier, O'toole & Walker, 2006; Brewer, Choi & Walker, 2007; Lee & Whitford, 2009). However, many indicators were used to measure government performance, such as effectiveness, bureaucratic quality, corruption, among others (Apaza, 2009; Coccia & Benati, 2017; Lee & Whitford, 2009). In this study, government performance will be addressed by the government effectiveness indicator, which measures the quality of public services and the formation and implementation of public policies, the credibility of government and the degree of independence of political pressures.

Little attention has been paid to comparisons between countries regarding government effectiveness, and the case study was the methodology used in most studies (Brewer *et al.*, 2007; Lee & Whitford, 2009). The results obtained by the research are not similar. Some studies have shown that a good government effectiveness stimulates economic growth (Acemoglu & Robinson, 2008; Alam *et al.*, 2017; Barro, 1996; Cooray, 2009; Kraay & Kaufmann, 2002), while others have shown that this effect is doubtful (Quibria, 2006; Kurtz & Schrank, 2007). The research by Kurtz and Schrank (2007) even showed that there is no effect of government effectiveness on economic growth.

Part of government effectiveness is related to state-owned enterprises or SOEs, given that they offer public services and may also influence the credibility of the government. In this sense, there is an extensive empirical effort to explore the relationship between companies that have the state as owner and their performance (Zahra, Ireland, Gutierrez & Hitt, 2000).

However, little attention has been given to the issue of decision-making regarding investments made by state-owned enterprises (Zahra *et al.*, 2000). Studies show that the decision to invest by state-owned companies is based on a number of factors, including competition (Steensma & Yang, 2013), board monitoring (Guldiken, 2013), career risk (Aghion, Van Reenen & Zingales, 2013) and resource slack (Nohria & Gulati, 1996).

The managers of state-owned enterprises often prioritize the state's political claims focused at their personal promotion or to minimize the risk of losing their jobs (Li & Qian, 2013). Thus, investments by state-owned enterprises become more inefficient (Boubakri, Cosset & Saffar, 2008; Brey *et al.*, 2013; Shleifer & Vishny, 1994) and may be higher in environments that have less governmental effectiveness, as in these contexts, there is a likelihood of using state-owned enterprises to serve the personal interests of bureaucrats and politicians (Fontes & Alves, 2018; Stan, Peng & Bruton, 2013).

The objective of this research is to analyze the relationship between government effectiveness and investments made by state-owned enterprises in several countries. The term "government effectiveness" used in this study comes from the indicator developed by the World Bank, which captures the perception of the quality of public services offered, as well as the degree of government independence from political pressures and the quality of the formulation and implementation of policies (World Bank, 2014). As for investments by state-owned enterprises, four variables were used (Increase in Investments, Number of Employees, Intangible Assets, Short-Term Investment and Return on Investments) from the Compustat Global database. Compustat Global provides financial and market data from over 13,000 companies in over 80 countries. Data is collected by Standard & Poor's based on an examination of companies' financial statements. For state-owned enterprises, we used data from companies that are listed on the stock market and that the government is the majority shareholder (with a stake of more than 50% in the share capital).

Compustat Global data has already been used to analyze issues pertaining to state-owned enterprises, such as corruption (Lopes Júnior, Câmara, Rocha & Brasil, 2018), corporate governance (Lin, & Chang, 2018), innovation (Aghion et al., 2013), foreign direct investment (Li & Xia, 2017) and political risk (Glambosky, Gleason & Madura, 2010).

This research contributes to the theory by adding a new perspective that may be crucial in explaining state-owned enterprises' investments, as they can help the company maintain or increase its competitive advantage (Guellec & Potterie, 2004; Kor & Mahoney, 2005; Zaheer & Bell, 2005). Therefore, it is considered that the effectiveness of government may be one of the factors that should be evaluated when deciding on the investments that will be made by state-owned enterprises, especially when it comes to the existence of political interests that permeate state-owned companies (Boubakri, Cosset & Saffar, 2008; Brey, Camilo, Marcon & Bandeira-de-Mello, 2013; Shleifer & Vishny, 1994).

As the influence of politicians on state-owned enterprises is greater in environments with poor corporate governance, an analysis of the relationship between government effectiveness and investments can help to elucidate the inefficiencies of state-owned enterprises, given that the poor quality of public services indicate that there is a greater likelihood that services will be used by politicians for the purpose of private / political gain, given that state managers are under greater pressure to divert their focus from pursuit of strictly economic objectives (Shleifer & Vishny, 1994).

2 THEORETICAL FOUNDATION

2.1 State-Owned Enterprises and Corporate Governance

State-owned enterprises are organizations that do not have a universal structure, as they originate in different countries and must meet their local specificities. However, in most cases, these corporations operate in two models, the first of which stands out for the use of exclusively governmental capital, and the second for state-owned joint-venture firms, which use external financing to fund their operations. Thus, the government has the majority of actions and control over organizational decisions, but does not act as its sole provider of resources (Fontes & Picolin, 2008; Miranda & Amaral, 2011).

Regarding the purpose of state-owned companies, they are created to serve certain public services, social policies or strategic sectors of the economy. Initially acting in favor of the collective interest, but as mixed state-owned enterprises grow, there is a need to satisfy the wishes of all its shareholders, which can be configured as a dual purpose, given that the latter do not always share the same goals and aspirations of the state (Cahen, 2015; Miranda & Amaral, 2011; Ribeiro & Chede, 2006).

Another very common aspect is the problem of agency between the state as owner and managers of state enterprises. In addition, private shareholders, who are routinely financial investors, can also put pressure on state-owned enterprises to act more like a for-profit private company and pursue economic profit. The governance problem in listed state-owned enterprises is moderated by the influence of private shareholders. Because shareholder goals are potentially incompatible with those of SOE, managers of state-owned enterprises may be able to exploit the lack of clarity in company goals to ensure an easy life for themselves and their employees (Shleifer & Vishny, 1994).

Thus, state-owned enterprises may face agency problems involving the Principal-Principal conflict, in which the majority shareholder (government), through its influence and corporate control, starts working with executives, so these will support their decisions in line with government policies, thereby expropriating the interests of other minority partners (Fontes & Alves, 2018).

In this sense, Brey, Camilo, Marcon and Bandeira-de-Mello (2013) emphasize that this fact occurs because the State aims at social and political gains, working on actions that favor job creation, price reduction or greater regional development, which is not always favorable to the organizational financial results, since many of these deliberations are contrary to the pretensions of the other investors that want the performance of the state-owned companies more focused on the private management and the economic profit.

Thereby, conflicts similar to the ones mentioned above may occur in state-owned companies. However, due to the misunderstanding between managers and minority shareholders, arising precisely from this lack of clarity in the firm's objectives, as was highlighted by Jensen and Meckling (1976), the separation between control and organizational ownership causes conflicts of interest involving the agents who are assigned to the management of the enterprise, with the principal owners who finance corporate projects.

In this situation, managers can take advantage of this lack of clarity about the company's future plans, making decisions for their own benefit, listing investments that give them a lower risk or increasing their chances of career advancement, leaving behind in the background the effectiveness of these projects (Li & Qian, 2013; Shleifer & Vishny, 1994).

Zif (1981) argues that through this dichotomy of objectives, state-owned enterprises executives can work for financial gain or the government's political wishes. However, the author emphasizes that the management of this type of company should always be characterized by a combination of both purposes, so that one of the organizational objectives does not overlap to the detriment of the other.

Aiming at solving the mentioned problems, the corporate governance has emerged as a mechanism that enables the monitoring of executives by the shareholders, as well as a more equitable and fair treatment of the latter, so that no expropriation of interests by any of the members of the company occurs (Camargos & Barbosa, 2010).

Governance is even more prominent in state-owned firms, as they are responsible for providing public services effectively and efficiently, directly impacting government credibility (Grossi, Papenfuß & Tremblay, 2015). Thus, the need for corporate governance is evidenced, both for state-owned enterprises to fulfill all their purposes and for countries with the state and its ability to meet the quality of policies, as well as the public services entrusted are evaluated, otherwise they will face credibility problems with society.

2.2 Government Effectiveness and Investments

Corporate governance is considered fundamental for countries, because through it a greater number of investments are destined to their markets where, above all, foreign shareholders begin to give greater credibility and trust in these nations, considering that their economic returns will be more assured in strong governance environments (Gani, 2007).

Given this situation, various methods have been established to measure governance in countries, including the World Bank's Worldwide Governance Indicators (WGI), and are widely used in studies because of their ability to indicate stakeholder perception of government quality and effectiveness, besides allowing a comparison between several countries over time (Marino, Soares, Luca & Vasconcelos, 2016).

Regarding the indicators, Kaufmann, Kraay and Mastruzzi (2011) endorse that to measure governance, three areas were established, which comprise from government substitution and monitoring to its ability to formulate and execute public policies, and citizens' respect about state institutions. The government effectiveness indicator, which is one of the components of the WGI, is measured by the proper implementation of public policies, quality of public services offered, as well as the degree of government independence from political pressures and therefore its credibility with society (World Bank, 2014)

The indicator is calculated based on more than 30 underlying data sources from around the world. These data sources are scaled and combined to create the indicator using a statistical methodology known as the unobserved component model. The entire methodology for creating this indicator is described on the Worldwide Governance Indicators database page (WGI, 2019).

As a result, some research shows that nations with strong effective governments undergo a process of leveraged economic growth, precisely because of this good state effectiveness (Acemoglu & Robinson, 2008; Alam *et al.*, 2017; Barro, 1996; Cooray, 2009; Kraay & Kaufmann, 2002). However, such findings are not unanimous, considering that other studies distrust this effect (Kurtz & Schrank, 200; Quibria, 2006), especially the study of Kurtz & Schrank (2007), who found that economic growth is not impacted by government effectiveness.

However, through the government's effectiveness indicator, the relationship between state-owned enterprises and state credibility becomes even clearer, which, associated with poor governance in the country, may lead to a worsening of the principal-principal conflict, since, as highlighted by Young, Peng, Ahlstrom, Bruton and Jiang (2008), in such environments the concentration of actions that generate conflict between business owners is more common.

In the face of this softer governance, the use of state-owned enterprises to serve political ends becomes even more widespread, as the government is its majority shareholder and the protection of minority investor expropriation is smaller, making state-owned companies controlled by bureaucrats and politicians who privilege their interests (Fontes & Alves, 2018; Stan, Peng & Bruton, 2013).

Through this conjuncture, managers choose to meet the pretensions of state policy in order to win promotions or to mitigate the risk of losing their positions (Li & Qian, 2013). Because of this context, state-owned enterprises' investments become inefficient due to the acting of the political interests that affect their firms' financial results (Boubakri, Cosset & Saffar, 2008; Brey *et al.*, 2013; Shleifer & Vishny, 1994).

Thus, there may be an increase in investments by state-owned enterprises in environments of less government effectiveness (governance), given that they can be used to meet political demands, but without ensuring that their resources are efficiently allocated .

In this regard, studies have been conducted associating investment decision-making by state-owned enterprises such as career risk, resource slack, board monitoring and competition (Aghion *et al.*, 2013; Guldiken, 2013; Nohria & Gulati, 1996; Steensma & Yang, 2013). However, Zahra *et al.* (2000) point out that the approach of investments of state corporations is not a theme that has been widely addressed by researchers, with little research being listed and the existence of theoretical gaps that relate theories to the practices presented by these companies.

The relationship between government effectiveness and state-owned enterprise investments has been researched from a variety of academic research sources (such as SciELO, Research Gate, and Google Scholar), as well as references from the articles that were found. However, no results were found addressing this relationship specifically. Government effectiveness was related to several other factors, such as environment (Sofia, 2019), finance (Olubiyi, 2013; Pérez-Cárceles & Gómez-García, 2019; Ibrahim, 2019), socioeconomic indicators (Marino *et al.*, 2016), entrepreneurship (Friedman, 2011; Friedman, 2014), health (Hu & Mendoza, 2014; Batniji, 2014; Ciccone, Vian, Maurer & Bradley, 2014) and GDP (Han, Khan & Zhuang, 2014).

Sofia (2019) analyzed the relationship between governance and environmental performance and concluded that governance measures, including government effectiveness,

have no effect on environmental practices. The study conducted by Han, Khan and Zhuang (2014) examined whether a country with a governance “surplus” in a given base year grew faster on average over a subsequent period than a country with a governance deficit. As a result, the government effectiveness indicator had a positive impact on gross domestic product (GDP) growth in the surveyed countries.

The study by Marino *et al.* (2016) proposed to identify the relationship between World Bank indicators of world governance and the socio-economic development indices of the BRICS countries. As a result, government effectiveness has had a significant and positive impact on the Human Development Index (HDI). The research by Hu and Mendoza (2014) related variables of corporate governance with determinants of child health. In conclusion, the authors showed that good government effectiveness promotes a reduction in child mortality rates.

Friedman's study (2011) found a negative relationship between the government effectiveness indicator and the level of entrepreneurship and suggested that further studies should be conducted to identify other variables that could also affect this relationship. One possible explanation for this result is that some countries have strong entry barriers to new business. Friedman's research (2014) explored the relationship between corporate governance variables and the size of the informal economy in 149 countries. However, the government effectiveness variable did not present consistent results and had to be removed from the model.

Olubiyi's study (2013) showed that better governance conditions (including government effectiveness) generated more direct investment capture in Nigeria. Cahen (2015) analyzed the decisions of state-owned enterprises to make investments abroad through a case study of state-owned Petrobras. The author identified that when SOE undergoes a process of change in its home country, whose government influence over it is reduced and its objectives are more balanced with market proposals, there is a greater possibility of a SOE operating abroad, especially in environments where state influence in the market is smaller.

Thus, throughout the above, it is important to consider the effectiveness of the state as one of the factors that supports and impacts the investment decision-making process by state-owned enterprises, considering the influence of the government's political interests and their control over the state-owned enterprises, where the latter's investments may be increased and aiming at social and political gain, without, however, favoring organizational economic profit or effectiveness in choosing these corporate investments.

3 METHOD

For Creswell (2010), the most traditional form of research is based on a deterministic philosophy, in which the causes probably determine the effects or results and their problems reflect the need to identify and evaluate the causes that influence the results. Therefore, this research fits into this conception when it seeks to analyze the relationship between government effectiveness and investments made by state-owned enterprises.

To this end, a quantitative approach was employed to try to fill an existing theoretical gap on the subject studied. The quantitative approach is commonly used in descriptive studies, seeking to discover and classify the causal relationship between the variables studied. According to Creswell (2010), the development of quantitative research is a means to test objective theories by examining the relationship between variables.

Regarding the objectives, the methodology to be employed in this study has an exploratory-descriptive character. The exploratory study serves as the basis for hypothesis

formulation, isolating variables and key relationships for descriptive analysis (Marconi & Lakatos, 2002). The descriptive phase count with data collection and statistical analysis.

For this research, data from a particular type of SOE were used, in other words, companies that are listed in the stock market but have the government as their majority shareholder (with a stake of more than 50% in equity). A feature of this type of enterprise is that, because they have the state as the majority shareholder, they can be motivated by different goals and not solely by economic profit.

For this study, secondary data were used from the Compustat Global database, between the years 2002 and 2011. The use of the data only until 2011 was because it is believed that it would be sufficient to capture the effect of the financial crisis of 2008, which was the cutoff point applied in the statistical technique used in the study (which will be explained later in this section). For Pagot and Jardim (2014), the recovery from the crisis began in 2011, mainly leveraged by BRICS countries. For comparison effect with the results of the post-crisis 2008 analysis, a placebo analysis was performed using 2005 as the cutoff point and the same logic was used for data collection from 2002 onwards.

Initially, 106,765 observations from companies from 41 countries were collected from the Compustat Global database. The variables used were: Increase in Investments, Number of Employees, Intangible Assets, Short-Term Investment and Return on Investments, as shown in Figure 1. The database does not include companies in the financial industry. Comparing them with companies in other segments could be a major limitation, given the specificities of financial companies.

Some procedures were performed to clean the database. Initially, those observations with zero values for the Number of Employees variable were excluded. Then, the variables that presented a percentage of missing values greater than 10% were treated, filling in the values with the average of the respective variable. Finally, after analyzing and excluding duplicate observations, the final sample resulted in 47,559 observations from companies in 41 countries. In the end, the sample consisted of 5,020 companies, considering that there was no information from some companies for each year.

Government effectiveness in this study was measured by the Government Effectiveness indicator, which addresses the quality of services and the credibility of government, and is derived from a World Bank database called “Worldwide Governance Indicators”. This database has aggregated and individual information on governance indicators from 213 countries over the period 1966 to 2012 (World Bank, 2014). The values of this indicator range from -2.5 to 2.5, and the lower the value, the lower the quality of services and the credibility of the government. Regarding descriptive statistics, the mean government effectiveness variable was 0.76, the standard deviation was 0.91, the minimum value was -2.26, and the maximum value was 2.43.

To identify state-owned enterprises, the Mergers & Acquisitions (M&A) database developed by Thomson Reuters was used. M&A presents a data set of the activity of public and private companies since the late 1970s across all major business types. In addition, in order to identify state-owned enterprises, the official company websites as well as their activity reports were consulted.

This research can be considered a quasi-experiment, which occurs when an exogenous event affects the variable to be explained - dependent. The difference for an experiment is that there may be no control variables and / or the sample is not random (Cozby, 2006). The descriptive and multivariate statistical technique used in this study was Difference-in-Differences or Diff-in-Diff, which measured the effect of government effectiveness on investments made by state-owned companies after the 2008 crisis. The implementation of

Diff-in-Diff was performed using a double-fixed panel model, both in the enterprise and time dimensions, and the analyzes were performed with the aid of STATA software.

Scenario Variable	
Variable	Formula/Description
<i>Government Effectiveness</i>	Perceptions about the quality of public services, and quality of the formation and implementation of public policies, as well the credibility of government commitment for such policies.
Dependent Variables	
Variable	Formula/Description
<i>Intangible Assets</i>	This item represents the net value of intangible assets. Intangibles are assets that have no physical existence in themselves, but represent rights to enjoy some privilege.
<i>Increase in Investments</i>	This item represents the funds used to increase a company's long term investments.
<i>Short Term Investment</i>	This item represents the currently tradable investments as presented in the Current Assets section of the Balance Sheet. Such applications are meant to be converted to cash within a relatively short period of time.
<i>Return on Investments</i>	This item represents the receipt of long-term investments.
<i>Number of Employees</i>	This item represents the actual number of people employed by the company and its subsidiaries.
Control Variables	
Variable	Formula/Description
Country	Series of dummy variables, each related to a country, where 1 indicates that the company operates in the country and zero otherwise.
Year	Series of dummy variables, each related to one year.
Companies	Series of dummy variables, each related to a company.
Type	Dummy variable related to a type of company, where 1 indicates that the company is a state-owned enterprise and zero for a private company.
Crisis	Dummy variable related to the international crisis of 2008, with a value of 1 for the years 2008 onwards and zero for the years prior to 2008.
TypexCrisis	Dummy variable, where the interaction between the two previous dummies will capture the companies (i) in the year (t) that are state-owned enterprises and go through the crisis receiving the value 1 and 0 for the other companies.
Crisis (2006)	Dummy variable related to the placebo effect for the crisis, with a value of 1 for the years 2006 onwards and zero for the years before 2006.
TypexCrisis (2006)	Dummy variable, in which the interaction between the Type and Crisis dummies (2006), which will capture the companies (i) in the year (t) that are state-owned enterprises, which from 2006 onwards receive the value 1 and 0 for the other companies.

Figure 1. Study variables

The Table 1 presents the descriptive statistics of the investment variables, year by year. Regarding the variables “Number of Employees” and “Short Term Investment”, after the 2008 crisis the average investment increased and then there was a reduction in the next two years. Regarding the variable “Intangible Assets”, the behavior was the opposite: there

was a reduction in 2009 and increases in subsequent years. The variables “Return on Investments” and “Increase in Investments” did not show a behavioral pattern after the 2008 crisis.

Table 1
Descriptive Statistics of Investment Variables

Year	Employees		Intangible Assets		Short Term Investments		Return on Investments		Increase in Investments	
	Average	SD	Average	SD	Average	SD	Average	SD	Average	SD
2002	5,39	4,6	359,45	4.029,6	640,30	5.478,1	975,70	1.709,4	263,31	1.173,7
2003	5,39	4,7	371,51	3.894,5	625,62	5.073,4	1.317,49	2.514,1	332,33	1.474,8
2004	5,81	4,4	408,43	4.033,4	585,80	5.039,1	675,26	2.693,5	191,67	826,9
2005	6,55	4,0	413,00	3.955,8	710,15	5.932,5	964,31	2.058,8	260,21	1.212,2
2006	5,74	4,5	445,63	4.192,1	523,87	4.673,6	668,05	2.838,7	244,80	1.237,0
2007	5,92	4,4	458,25	4.089,8	545,65	4.931,2	1.060,33	2.123,9	444,17	1.450,1
2008	6,08	4,3	561,98	4.823,2	583,87	5.226,1	893,94	2.945,4	550,22	2.044,3
2009	6,16	4,3	553,36	4.630,6	615,47	5.469,5	1.165,12	1.970,8	259,60	1.340,1
2010	6,01	4,3	589,24	4.726,9	582,13	5.266,8	607,97	2.485,5	305,58	1.442,9
2011	5,75	4,3	663,42	4.968,9	454,16	4.306,3	961,93	2.642,7	111,93	587,3

* Values in US\$ thousand.

Meyer (1995), in his seminal work, describes the Diff-in-Diff method as suitable for conducting experiments, through which it is possible to identify the influence of an exogenous source on explanatory variables, induced by a change in policy or similar event. To implement the Diff-in-Diff model, a double-fixed panel data regression was used, since it is the best fit for longitudinal studies with multiple variables, whose units are repeated along the various cutoffs into cross-sections.

According to Imbens and Wooldridge (2009), Diff-in-Diff is adequate when it’s desired to observe the behavior of two distinct groups for two or more periods of time. The technique seeks to compare the two groups, called treatment and control. The treatment group is made up of companies that have been treated (for this study, it is state-owned enterprises that are under pressure from politicians). The control group is formed by the other companies that have not been treated (private companies that do not suffer interference from politicians).

Therefore, for a given investment variable, the population treatment effect is given by the difference in the treated and control units variable before and after the event (2008 crisis). The hypothesis of identification of the Diff-in-Diff method is that, in the absence of treatment, the treated and control groups should follow parallel paths (Carvalho, 2019).

Regarding the influence of the exogenous source on investments made by state-owned enterprises, two cutoffs were analyzed. Firstly, the years 2008 to 2011 were used as a post-crisis period (column TypeXcrisis in Tables 4 and 5) to verify the effect of the 2008 crisis on the investments of state enterprises. Subsequently, the years 2006 to 2011 were used as the post-crisis period (column TypeXcrisis (2006)) to verify whether the Diff-in-Diff results are specific to the 2008 crisis period. So, the period from 2006 to 2011 served as a placebo. Therefore, the 2008 crisis was chosen as a cutoff point because it was an exogenous event outside the control of companies that theoretically promoted a restriction on spending.

The fixed cross-section effect is used to capture unobservable characteristics time invariants, while the fixed time-effect is used to capture common elements to all companies that are invariant over time (Meyer, 1995).

The model used can be written as follows:

$$Y_{it} = \alpha_i + \Psi_t + \beta_1 Tipo + \beta_2 Crise + \beta_3 TipoxCrise + \beta_4 Ano + \beta_5 País + \varepsilon_{it} \quad (1)$$

Where:

Y_{it} = Investment (Increase in Investments, natural logarithm of Number of Employees, Intangible Assets, Short Term Investment and Return on Investments).

α_i = Fixed effect of companies.

Ψ_t = Fixed time effect.

β_1 Type = dummy variable that receives the value 1 if the company is an SOE and 0 if it is a private company.

β_2 Crisis = dummy variable that receives the value 1 if company (i) in quarter (t) is present in the crisis period (from 2008 to 2011) and 0 for the other periods collected in the sample.

β_3 TypexCrisis = dummy variable that captures the effect of Diff-in-Diff, in other words, the difference of groups in periods of crisis. It is represented by the interaction between the two previous dummies.

β_4 Year = dummy variable for year.

β_5 Country = dummy variable for country.

4. RESULTS

4.1 Presentation of Results

The Government Effectiveness variable was approached through a subdivision of the general sample. Therefore, the median was used to characterize different levels of government effectiveness. Thus, the database was divided into two: in the first, were selected only private and state-owned enterprises with a median of less than 0.76 and 0.45, respectively. In the second database, were selected private and state-owned enterprises with a median equal or higher than 0.76 and 0.45, respectively. Thus, the first base can be considered an environment with low government effectiveness, while the second base can be described as environment with high government effectiveness.

Prior to the analyzes, multivariate normality tests (Table 2) and the correlation between variables (Table 3) were performed. According to Xavier (2011), these tests are crucial to verify if the assumptions of the statistical tests are partially met. In this case, it was not necessary to perform interventions in the database. All four tests performed refuted the null hypothesis of multivariate normality (considering that Prob> chi2 values were less than 0.01). The univariate normality test also refuted the assumptions of absence of asymmetry, kurtosis and normal distribution. The tests were made from the *mvtest normality* command of the STATA program, with the *all* option.

Table 2

Multivariate Normality Tests

Mardia mSkewness	=	9.303.455	chi2(816)	=	1.45e+08	Prob>chi2	=	0.0000
Mardia mKurtosis	=	11692.07	chi2(1)	=	5.26e+09	Prob>chi2	=	0.0000
Henze-Zirkler	=	1.325.681	chi2(1)	=	9.15e+08	Prob>chi2	=	0.0000
Doornik-Hansen	=		chi2(32)	=	3.84e+08	Prob>chi2	=	0.0000

Regarding the correlation results presented in Table 3, most correlations were weak (with values up to 0.2999) and only three were moderate (with values between 0.3000 and 0.4999), suggesting a low association between the variables. All correlations between the “Government Effectiveness” variable and the other investment variables were statistically

significant at 1%, however, due to the low values, the linear relationship between the variables can be considered weak.

Table 3
Correlation coefficients between the variables

	Intangible Assets	Number of Employees	Increase in Investments	Return on Investments	Short Term Investments	Government Effectiveness
Intangible Assets	1					
Number of Employees	0,3785*	1				
Increase in Investments	0,0692*	0,0088*	1			
Return on Investments	0,3370*	0,0624*	0,4471*	1		
Short Term Investments	0,0177*	-0,004	0,0444*	0,0229*	1	
Government Effectiveness	-0,0432*	0,0392*	-0,2277*	-0,2616*	-0,2646*	1

*significant values at 1%

Table 4 shows the Diff-in-Diff results for the first database (environments with low government effectiveness).

Table 4
Diff-in-Diff results for environments with low government effectiveness

Variable	typeXcrisis	P> z	typeXcrisis (2006)	P> z
Increase in Investments	-12906,64	0,848	187957,7	0,662
Number of Employees	6240,49	0,036	3842,73	0,173
Intangible Assets	3.39e+08	0,073	248902,50	0,709
Short Term Investments	8.95e+08	0,058	-596421,80	0,239
Return on Investments	-547840,70	0,000	43435,53	0,741

The table 4 was used to perform the comparative analysis of state-owned enterprises' investments in relation to investments by private companies. The column "TypeXcrisis" reports the main result of the Diff-in-Diff, which shows that positive values indicate that the amount invested by state-owned companies is higher than the amount invested by private companies after the 2008 crisis. However, this interpretation can only be validated if the result of the column "P> | z |" is significant (up to 0.100).

Similarly, the same reasoning can be applied in the analysis of the column "typeXcrisis (2006)". However, the interpretation given is to compare the investments of state-owned enterprises with those of private enterprises after 2005. The intention of this column is to verify whether the results of the study can be attributed specifically to the 2008 crisis.

The results that were significant (values of the column "P> | z |" below 10%) of the column "typeXcrisis", with the exception of the variable *Increase in Investments*, indicate that there is a difference between the behavior of investments made by private companies and state-owned enterprises after the crisis period. The significance results (above 10%) of the column "typeXcrisis (2006)" indicate that there is no difference regarding the behavior of

investments made by private and state-owned companies if the cutoff point is the year of 2006.

Regarding the signal load of the coefficients of the typeXcrisis variable, practically all variables that characterize environments with low government effectiveness were positively charged, except for the *Return on Investments* variable. The sign and significance of the other variables allow us to conclude that, in environments with low effectiveness, state-owned companies with the government as the majority shareholder invest more than private companies.

For comparison purposes, the same tests were performed using the second database (companies that are located in highly effective government environments). The results (Table 5) show that, for all dependent variables, there are no differences between public and private companies before and after the adopted cutoff period (2008 and 2006). Therefore, state-owned enterprises that have the government as the majority shareholder only invest more in relation to private companies when they are in environments with low government effectiveness.

Table 5
Diff-in-Diff results for environments with high government effectiveness

Variable	typeXcrisis	P> z	typeXcrisis (2006)	P> z
Increase in Investments	-273,20	0,992	15361,12	0,476
Number of Employees	843,18	0,861	-633,04	0,895
Intangible Assets	103897,6	0,206	93251,19	0,258
Short Term Investments	35016,16	0,268	-1612,47	0,958
Return on Investments	-60896,42	0,104	-56606,47	0,112

This result may be partly explained by the fact that countries with low government credibility are associated with high levels of corruption, so, state-owned enterprises may be used as channels for resource misuse (Brewer *et al.*, 2007). According to Cooray (2009), countries with better governance (measured, for example, by indicators related to corruption and government effectiveness) make more effective use of public spending. In this sense, countries with more open and transparent societies are more effective in delivering public services (Brewer *et al.*, 2007).

4.2 Discussion of Results

Higher investment in employees may be an indication that politicians can use their influence on state-owned enterprises to hire employees in exchange for political favors. The study by Gomes (2017) addressed this theme and found that state-owned companies can be recognized as excellent bargaining mechanisms and exchange of favors. Following this same idea, short-term investments can facilitate the exchange of political favors. For Campos and Pereira (2016), in state-owned enterprises, this type of investment has higher values than necessary due to inefficiencies.

Higher investments in intangible assets by state-owned enterprises may entail short-term distortions for faster gains, which are easier to misappropriate. Because the management of intangible assets is more complex than that of tangible assets (Lev, 2001), managers can take advantage of this to drive increased investments in intangible assets. The lower return on investment of state-owned enterprises can be explained by their own inefficiency, which can be very detrimental to the enterprise and society itself (Shleifer & Vishny, 1994).

However, higher investment by state-owned enterprises is not always related to positive results. This is because public resource management is part of the principal-agent problem, whereby the principal (the public) has less information about the intentions and actions of the agent (government) in spending public money. This situation of information asymmetry can lead to a suboptimal outcome, with the government not acting in the best interests of the public and making unnecessary and inefficient spending (Montes, Bastos & de Oliveira, 2019).

Because authorities and politicians have influence over state-owned enterprises, the resources that should be spent on public services and infrastructure are often diverted to private gain before they reach their destinations. Corruption is another factor that can make governments inefficient, because it causes poor distribution of public spending since resources are directed towards paying bribes rather than improving people's lives (Montes & Paschoal, 2016).

One solution that could alleviate this distortion would be to increase government transparency, as, according to Montes, Bastos and Oliveira (2019), it has a direct effect on government effectiveness (and on the effectiveness of government spending). Combating corruption is also considered a strategy that can, ultimately, improve the effectiveness of governments.

However, such combat may run into the "political will" that, according to the study by Ankamah and Manzoor (2018), has a positive influence on the government's anti-corruption efforts. While "political will" may not be sufficient, it is a necessary condition for combating corruption, and when politicians are involved in corruption cases related to state-owned enterprises, they are unlikely to strive to enact anti-corruption measures.

Government (or politician) may have greater influence on the state-owned enterprises analyzed in this study because it is the majority shareholder. Therefore, the influence of politicians on state-owned enterprises may have been an important factor in the occurrence of more investment after the 2008 crisis. The results corroborate the thought that in less governmental environments state-owned companies are used to meet the personal interests of bureaucrats and politicians (Fontes & Alves, 2018; Stan, Peng & Bruton, 2013).

An example of this influence of politicians on state-owned companies is the case of the scheme that occurred in Petrobras and was discovered by the Federal Police through Operation Lava Jato. One modality of the scheme was the overpricing of contracts with companies to provide the diversion of money from Petrobras to those involved. In the scheme, lobbyists, money changers and other operators were in charge of distributing the money received between politicians and civil servants (Medeiros & Silveira, 2017).

5 FINAL CONSIDERATIONS

This research aimed to analyze the relationship between government effectiveness and investments of state-owned enterprises. Other researchers that studied the decision of investing by the state-owned companies indicated several factors as motivators of this decision, such as competition, board monitoring, career risk and resource slack. This study addresses a perspective that may also affect the decision of state-owned enterprises to make investments: the effectiveness of government. For Lee and Whitford (2009), the comparative study on government effectiveness (in terms of the use of multiple measures and the analysis of many countries) benefits the public administration field of study.

Given the analysis of the results, this study suggests that in environments with low effectiveness, state-owned companies with the government as the majority shareholder invest

more than private companies. However, misuse of resources (Cooray, 2009) can result in operational inefficiency.

This research brings relevant contributions to management theory, especially to strategic management. First, it improves understanding of SOEs' decision to invest, including a new perspective that may also explain SOEs' decision to make investments. As an empirical contribution, the study developed a database that involved the compilation of several data sources. The database, after treatment, is made up of 47,559 observations from companies in 41 countries between 2002 and 2011 and can be used in other future studies related to corporate governance, state-owned enterprises and investments.

Some limitations of this study are linked to the database. The government effectiveness indicator is a corporate governance variable in a macroeconomic level, which makes the results very generic. In addition, corporate governance indicators are measures of perception and, although widely used in academic research, are subject to distortion.

Another possible limitation refers to the fact that the values of the variables related to investments and companies' performance are expressed in dollars in the Compustat Global database. However, as the database contains companies from various countries, fluctuating dollar exchange rates may have interfered with the outcome of the analysis, given that the way each country deals with dollar exchange rates is, in some cases, different.

One suggestion for future research is to include minority state-owned enterprises in the analysis. One proposal is to use the classification of Musacchio and Lazzarini (2012). For this study, we tried to make this classification, but only two types of state-owned enterprises in which the government is the minority shareholder were obtained: partially privatized companies and holdings.

As a control measure, the sector variable could also have been used to give more strength to the results, however, it was not used due to the presence of many missing values. As an alternative to using the Principal-Principal conflict option, the level of development rating of a country could be used to try to verify its impact on the amount invested, as well as on the effectiveness of state-owned investments. In this case, it can be expected that in less developed countries, the influence of politicians on state-owned enterprises is greater, promoting a greater amount of invested resources and less effectiveness of state-owned enterprises in relation to private ones.

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¹ The Government Effectiveness concept is derived from an indicator of the same name in a Worldwide Governance Indicators (WGI) database and is related to how government uses its power to create and enforce policies to benefit citizens.

Efetividade Governamental: Análise dos Investimentos de Empresas Estatais

RESUMO

Objetivo: analisar a relação entre a efetividade do governo e os investimentos realizados por empresas estatais.

Método: esse estudo faz uso de um quase-experimento utilizando a técnica de diferença em diferença (*Difference-in-Differences*). As variáveis utilizadas para a análise dos investimentos foram: Aumento nos Investimentos, Quantidade de empregados, Ativo Intangível, Investimento de Curto Prazo e Retorno dos Investimentos.

Originalidade/Relevância: pouca atenção foi dada para comparações entre países a respeito da efetividade do governo, além disso não foram encontrados estudos que abordaram a relação entre efetividade do governo e investimentos de empresas estatais.

Resultados: as empresas que têm o governo como acionista majoritário só investem mais em relação às empresas privadas quando estão em ambientes com baixa efetividade do governo.


Contribuições teóricas/metodológicas: em termos teóricos, a pesquisa abordou uma nova perspectiva que pode ser crucial para explicar os investimentos das empresas estatais: a efetividade do governo. A principal contribuição metodológica foi o uso de um estudo comparativo sobre a efetividade do governo (em termos da utilização de múltiplas medidas e da análise de muitos países).

Palavras-chave:

Efetividade do Governo; Investimentos; Empresas Estatais.

Elias Pereira Lopes Júnior 

Universidade Federal do Cariri, Ceará, Brasil
E-mail: elias.junior@ufca.edu.br

Pedro Igor de Sousa Damasceno 

Universidade Federal da Paraíba, Paraíba, Brasil
E-mail: pedroigordamasceno.adm@gmail.com

Rodolfo Jakov Saraiva Lôbo 

Universidade Federal do Cariri, Ceará, Brasil
E-mail: rodolfo.jakov@ufca.edu.br

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