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THE EFFECTS OF STATE PARTICIPATION ON EARNINGS QUALITY IN BRAZILIAN COMPANIES

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ABSTRACT

The aim of this article is to analyze the effects of state participation on earnings quality in the Brazilian capital market. This research examined data from companies listed on the B3 stock exchange between 1995 and 2015. The results presented contradict the international literature on the subject, demonstrating that, in the Brazilian environment, state participation has inverse effects on earnings quality when compared to the results of research in other countries.

Keywords: State-owned enterprises (SOEs), state participation, earnings quality, ownership structure, Brazilian capital market.
JEL: R

SUMMARY

1. INTRODUCTION

From the 1990s onwards, the privatization of state-owned companies due to the neoliberal wave led us to believe that state participation in the productive sector was in its final stages. However, a recent trend has been observed, especially in emerging economies: the resurgence of state capitalism (THE ECONOMIST, 2012). In this scenario, state capitalism is defined as the government's participation as a shareholder in various companies listed on stock exchanges in various countries, especially in emerging economies.

With this, relevant corporations have state participation but behave as if they were private sector multinationals (THE ECONOMIST, 2012), thus helping to foster national development in countries where the capital market is still developing (MUSACCHIO et. al., 2015).

In this sense, despite *disinvestment in the* productive sector since the 1990s, companies in which the government is a shareholder, known in international literature as "*state-owned enterprises (SOEs)*", persist and currently account for around 32% of the Gross Domestic Product (GDP), employing around six million people, as well as representing two trillion in market value in emerging countries (MUSACCHIO & LAZZARINI, 2014).

In the above context, Wooldridge (2012) argues that there is a return to the nationalization of economies in emerging countries. However, according to Musacchio and Lazzarini (2013), SOEs have evolved to become *hybrid* SOEs in which state participation is mixed with the participation of private investors. According to Bruton et. al. (2015), this has led today's SOEs to institute important aspects in their management, such as strategy and corporate governance, which has made them different from the old inefficient SOEs that were created after the Second World War.

Despite the significant presence of SOEs in the capital market today, research based on samples of companies in which the government is one of the shareholders is still incipient, especially those in which the state's participation is *shared* with private investors. Most of the international literature presents analyses based on data from companies in which the government holds a controlling stake, or companies in which the capital is one hundred percent state-owned.

In addition, most of the international literature on SOEs is based on a sample of Chinese companies, which are located in a scenario that is very different from the Brazilian environment and the context of other emerging economies, such as India. As such, data samples from companies in which the government shares a stake with private investors (companies or individuals) are rarely analyzed. In this context, the effects of state participation in hybrid SOEs remain little

explored scientifically, especially in Brazil.

Considering the above, this research sought to analyze the data of Brazilian companies listed on B3 at different levels of state participation for a period of twenty years in order to try to access the effects of this participation in this new Brazilian context of hybrid state participation. The effects analyzed consider earnings quality *proxies* presented in the existing literature on the subject, namely: earnings persistence and earnings management.

With this in mind, this research aimed to contribute to the literature in the following aspects: Firstly, to expand the scarce literature on this peculiar type of organization - *hybrid SOEs* - in the Brazilian context, diversifying the limited scope of international literature - which is generally restricted to analyzing a sample of Chinese companies - making it possible to ascertain the effects of this context on *earnings quality*. Secondly, the results of this research shed light on the quality of the governance and regulatory mechanisms of Brazilian SOEs, contributing to possible adjustments. Thirdly, the results of this research make it possible to educate investors about the quality of information provided by companies in which the government is also an investor. And finally, the data presented can contribute to providing *policy makers* with relevant information about the accounting reports of companies that aim to allocate resources from the public budget in order to fill gaps, make strategic investments or implement national development plans.

2. PROFIT QUALITY AND SOEs: LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Companies in which the government is a partner, participating in or influencing resource allocation decisions, are a unique environment for studying the quality of profits. According to Shleifer and Vishny (1994), in these companies, decisions are made by managers chosen by political agents and, as a result, their motivations are not always aligned with the objectives of the other shareholders.

According to Song et al. (2016), in SOEs, a "*dual principal problem*" arises due to the incongruence of interests between the government shareholder and minority shareholders. In this sense, Hart (1980) argues that agency problems can be intensified considering that, in this scenario, management monitoring mechanisms are unable to exercise their function of supervising decision-makers, leading to lower levels of earnings quality.

For Durnev and Fauver (2010), in the specific market environment of low government

accountability and where there is little barrier to government expropriation of corporate resources, there are more incentives to manipulate accounting data in order to hide such expropriations (Ben-Nasr et al., 2014).

According to La Porta et al. (1999), the government, as the controlling shareholder, generally has *control rights* associated with *excess cash flow rights* and, in addition, participates in the management of the company and is not monitored by other shareholders, which leads to low levels of transparency. It is important to note that the premises of the *Soft Budget Constraints Theory* formulated by Kornai (1979) explain the peculiar behavior of SOE managers where there is no possibility of bankruptcy due to the fact that state resources cover losses in situations of poor performance.

According to An et al. (2016), low governance institutional environments can lead managers to have more opportunities and freedom to expropriate other shareholders. According to Watts and Zimmerman (1978), due to the social visibility of these companies, such decisions generate political costs, which motivates managers to make accounting and operational choices to reduce the political costs of the entities' poor performance.

In a cross-country study, Ben-Nasr et al. (2015) analyzed the effects of state participation on earnings quality in 350 companies from more than forty countries. The authors show that state participation is inversely associated with *earnings quality and* that the impact of state participation on earnings quality varies according to the institutional environment in which the company operates.

In this work, the authors formulate the *Political Interference Hypothesis*, according to which they argue that, in companies with state participation, the "government leads managers to manipulate results to hide the channeling of corporate resources into activities with political objectives", thereby reducing the quality of profits (Ben-Nasr et al., 2015, p.393).

This research aims to add to the analysis carried out by Ben-Nasr et al. (2015). While the authors evaluated the specific scenario of privatizations among companies in various countries to capture the effects of the institutional environment, this research adopts a different analysis by specifically examining data from Brazilian companies listed on B3 including hybrid state participation to test the *Political Interference Hypothesis* in the specific context of the more recent Brazilian capital market, which is characterized by state participation shared with private investors.

In this context, according to Inoue et. al. (2013), contemporary Brazilian SOEs, the government participates as a majority or minority shareholder - hybrid participation - in compa-

nies that have autonomous management and, not infrequently, good performance (Bruton et. al., 2015).

Unlike their predecessors, today's hybrid SOEs have governance and management that is comparable to, and sometimes better than, publicly traded companies in which the capital is entirely private. In their research on hybrid SOEs, Musacchio et. al. (2015) argue that, in Brazil, the government has become a minority partner in companies in which privatization has been partially carried out, thus becoming a *residual partner*.

In addition, Inoue et. al. (2013) show that, in the Brazilian context, the government becomes a shareholder in companies in order to remedy the "*institutional voids*" characteristic of developing economies, such as: underdeveloped capital markets, a shortage of skilled labor and inefficient legal systems.

Despite the aforementioned studies, the scarcity of studies highlights the gaps in the literature, leading us to consider a contemporary analysis of the effects of state participation in companies with these characteristics to be timely and pertinent, considering that the effects resulting from a *new type of state participation* remain little analyzed and, in the Brazilian context, as far as we know, remain practically unexplored.

In view of this, we considered the most recent studies on Brazilian companies with state participation, which show that Brazilian hybrid SOEs have different characteristics from those companies in which the state had a stake in the capital in the post-war period. This article therefore tests the following hypothesis:

H1: In the Brazilian context, hybrid state participation is negatively associated with earnings management.

H2: In the Brazilian context, state participation is positively associated with the sustainability of profits.

3. METHODOLOGY

3.1. Sample

In order to access the effects of state participation on earnings quality in the Brazilian context, a multivariate analysis was carried out on the panel data time series of companies listed on B3 in the Economática database from 1995 to 2015. The companies in the sample were sub-

divided into (1) SOEs (*state-owned enterprises*); and (2) POEs (*private-owned enterprises*). To test the robustness of the results, five types of state participation were used to run the regression model: **a.** government is the first largest shareholder; **b.** government has a controlling stake; **c.** government has a 20% or more stake; **d.** government is one of the three largest shareholders; **e.** government is one of the five largest shareholders, as shown in Table 2. Table 1 shows the data on government ownership of the companies in the sample.

TABLE 1: State Participation in Brazilian Listed Companies from 1995 to 2015

Panel A: 1st largest shareholder	**Frequency**	**%**
POEs	14.615	85,81
SOEs	2.416	14,19
Total	17.031	100,00
Panel B: Shareholder Control	**Frequency**	**%**
POEs	14.615	88,47
SOEs	1.904	11,53
Total	16.519	100,00
Panel C: Ownership of 20%+ shares	**Frequency**	**%**
POEs	14.161	98,02
SOEs	287	1,98
Total	14.448	100,00
Panel D: Top Three Shareholders	**Frequency**	**%**
POEs	12.654	74,30
SOEs	4.377	25,70
Total	17.031	100,00
Panel E: Top Five Shareholders	**Frequency**	**%**
POEs	12.347	72,50
SOEs	4.684	27,50
Total	17.031	100,00

Source: prepared by the author

The data on state participation in companies listed on B3 was collected manually on the website of the Brazilian Securities and Exchange Commission, on the website of the market consultancy firm EconoInfo and on the websites of the companies in the sample.

Due to the peculiarities of these companies' financial statements, the following were excluded from the sample: (1) Banks, (2) Stock and Commodities Exchanges, (3) Insurance Brokers, (4) Credit Intermediation Institutions and Related Activities, (5) Insurance Companies, (6) Financial Services and Insurance, (7) Other Banks.

3.2 Research design

3.2.1 Multiple Regression Model

The effects of state participation on earnings quality were examined using regression **model 1**, presented below:

$$EARNINGS\_QUALITY_{i,t} = \beta_0 + \beta_1 \, GOV_{i,t} + \Sigma \, \beta_2 \, CONTROLS_{i,t} + \varepsilon_{i,t} \qquad \textbf{(1)}$$

In this model, GOV is the variable of interest and represents the level of state ownership in the companies in the sample. In order to assess the effects of *state ownership* for different levels of shareholding, as a test of the robustness of the results, in this research, GOV represents five different variables as described in Table 2.

According to the extensive literature on the subject, various factors can influence the quality of profits (Ben-Nasr et al., 2015; Sousa & Galdi, 2016). Therefore, to control for the effects of these factors, in the model above, *CONTROLS* represents the different control variables used in the model.

Following the methodology used by Wang and Yung (2011), in the model above, *CONTROLS* includes the following control variables: (1) logarithm of total assets (LogAssets), used to control for firm size; (2) *market-to-book ratio* (M2B), calculated by the quotient between the firm's total market value and the difference between assets and liabilities, used to control for growth opportunity (Ben-Nasr & Cosset, 2014); (3) *debt-to-equity ratio* (D2E), measured by the quotient between total liabilities and total equity, which controls for capital structure and leverage; (4) *return-on-assets* (ROA), calculated by the quotient of earnings before taxes (EBIT) divided by the book value of total assets, used to control for profitability; and (5) *Tobin's Q ratio* (QRatio), a variable calculated by the sum of the book value of total assets and the market value of the company's share capital minus the book value of share capital divided by the book value of total assets, this being a variable used to control for market value and growth opportunity.

Also among the variables included in *CONTROLS*, following the extensive literature which shows that governance mechanisms affect the quality of earnings (Gaio & Raposo, 2014), the following variables were added: (1) audit firm (BIG4), where 1 is if the company is audited by audit firms included in the group of the four largest and 0 otherwise; and (2) Differentiated Levels of Corporate Governance (NDGC), where 1 represents companies listed on B3's Diffe-

rentiated Levels of Corporate Governance (NDGC) and 0 otherwise.

The dependent variable *EARNINGS_QUALITY*i,t of the empirical model consists of the earnings quality variable which, in this research, in line with previous research (DECHOW et al., 2010); (BEN-NASR et al., 2015), is measured by two *proxies*:

(1) *discretionary accruals* - AD;

(2) *earnings persistence* - EP.

TABLE 2: Definition of Multiple Regression Model Variables

Variable	Description of Variables
1. Dependent Variables: Earnings Quality Proxies (EARNINGS_QUALITY)	
ADJ91	*Discretionary accruals according to the Jones Model (1991)*
ADJ95	*Discretionary accruals using the Modified Jones Model (Dechow, et al.,1995)*
EP	*Earnings Persistence*
2. Variables of Interest: State Ownership Dummies (GOV)	
GOVT1	1 largest shareholder government, 0 otherwise
GOVTCTRL	1 government holds controlling stake, 0 otherwise
GOVT20	1 government owns more than 20% of the shares, 0 otherwise
GOVT3	1 government is among the three largest shareholders, 0 otherwise
GOVT5	1 government is among the five largest shareholders, 0 otherwise
3. Control Variables: Control Variables for Other Factors (CONTROLS)	
ROA	*Return-on-assets*
D2E	*Debt-to-equity*
M2B	*Market-to-book*
QRatio	Q ratio
LogActive	Logarithm of total assets
NDGC	NDGC dummy variable, where 1 is NDGC, 0 otherwise
BIG4	Audit firm dummy variable, where 1 is BIG4, and 0 otherwise

Source: author

3.2.1.1 Measures of Earnings Quality: Dependent Variable

In this research, the quality of earnings represents the dependent variable of the model, so we used two *proxies* described below (Dechow et al., 2010; Ben-Nasr et al., 2010).

3.2.1.1.1 Discretionary Accruals (DA)

The literature presents various models for measuring total discretionary *accruals*. In this

research, in order to measure the robustness of the results from the regression of *accruals models*, two models were used: Jones (1991) and Modified Jones (Dechow et al, 1995). According to Jones (1991), discretionary *accruals* are measured using the following model:

$$AT_{i,t} = \alpha + \beta_1 \Delta REV_t + \beta_2 PPE_t + \varepsilon_t \quad (2)$$

Where $\Delta REV_{i,t}$ represents the change in revenue at time t; t; $PPE_{i,t}$ the total fixed assets at time t and ε_t are the residuals of the model that are considered discretionary *accruals* (DA).

According to Dechow et. al. (1995), discretionary *accruals* are estimated using the following model:

$$AT_{i,t} = \alpha + \beta 1\ (\Delta NetRev_{i,t} - \Delta Rec_{i,t})/At_{i,t-1} + \beta_2\ PPE_{i,t}/At_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

Where $\Delta NetRev_{i,t}$ represents the change in company i's net revenue between period t and period t-1; $\Delta Rec_{i,t}$ company i's trade receivables between period t and period t-1;$PPE_{i,t}$ company i's fixed assets in period t; and $At_{i,t-1}$ company i's total assets in the previous year.

In order to estimate discretionary *accruals*, it is necessary to calculate the values of total *accruals*. Therefore, two different calculation methods were used. For the sample data from 1995 to 2009, due to the absence of operating cash flow data, total *accruals* were calculated using the indirect method, or balance sheet approach (Consoni, Colauto & Sampaio Franco de Lima, 2017), in which total *accruals* are measured using the following formula:

$$AT_{i,t} = (\Delta AC_{i,t} - \Delta Cash_{i,t}) - (\Delta PC_{i,t} - \Delta FE_{i,t}) - Depr_{i,t} / A_{i,t-1} \quad (4)$$

Where, $AT_{i,t}$ are the total *accruals* of company i in period t; $\Delta AC_{i,t}$ the change in current assets of company i between period t and t-1; $\Delta Cash_{i,t}$ the change in cash and cash equivalents of company i between period t and t-1; $\Delta PC_{i,t}$ the change in current liabilities of company i between period t and t-1; $\Delta FE_{i,t}$ the change in company i's short-term loans and financing between period t and t-1; $Depr_{i,t}$ company i's depreciation, amortization and depletion in period t; and $A_{i,t}$ company i's total assets in period t-1.

For the period from 2010 to 2015, data from the cash flow statement is available due to the obligation to prepare this statement from that date. Total *accruals* are therefore calculated using the direct method, using the following formula:

$$AT_{i,t} = EBIT_{i,t} - FCO_{i,t} \quad (5)$$

Where $EBIT_{i,t}$, stands for *Earnings Before Interests and Taxes of* company i in period t and $FCO_{i,t}$, the operating cash flow of company i in period t.

For both models, the discretionary *accruals* were generated by running the respective regressions in a *loop in* Stata, establishing a minimum of six observations and, in this procedure, storing the residuals of each model, which are the discretionary *accruals* to be used in the empirical model of the research.

3.2.1.1.2 Earnings Persistence (EP)

According to Dechow et al. (2010), earnings persistence indicates better earnings quality, considering that they represent the sustainability of accounting results. The following model was used to measure the earnings persistence of the companies in the sample:

$$EARNINGS_{t+1} = \alpha + \beta_1 EARNINGS_t + \varepsilon_t \quad (6)$$

In this model, $EARNINGS_{t+1}$ represents the profit for the year, $EARNINGS_t$ the profit for the previous year and the coefficient β_1 measures the persistence of profits, where the higher β_1 the greater the persistence of profits, and consequently the better the quality of profits.

According to Ben-Nasr et al. (2015), β_1 close to 1 indicates more persistent profits and β_1 close to 0 indicates more temporary profits. To calculate PE, regressions were run in a *loop* for sector and year in the Stata module, storing the β_1 coefficient from model 7. All the *proxies* generated were *winsorized* at 2.5% to reduce the effects of *outliers* in the sample.

4. RESEARCH RESULTS

4.1 Empirical analysis

Table 3 shows the descriptive statistics of the variables in the empirical model that were generated using procedures in the STATA module.

TABLE 3: General Descriptive Statistics of the Sample

VARIABLES	N	Average	Standard Deviation	Min.	Max.
ADJ91	17.031	0,012	0,021	0	0,072
ADJ95	17.031	0,011	0,020	0	0,072
EP	8.257	0,305	0,571	-0,853	1,597
GOVT1	17.031	0,142	0,349	0	1
GOVCTRL	16.519	0,115	0,319	0	1
GOVT20	17.031	0,169	0,374	0	1
GOVT3	17.031	0,257	0,437	0	1
GOVT5	17.031	0,275	0,447	0	1
ROA	17.031	0,052	0,096	-0,207	0,274
D2E	17.031	2,791	4,205	0,021	19,253
M2B	12.285	0,960	1,418	0	6,478
QRatio	12.284	1,009	0,493	0,193	2,701
LogActive	17.031	13,521	2,032	8,906	17,373
BIG4	13.361	0,631	0,482	0	1
NDGC	8.757	0,436	0,496	0	1

N represents the number of observations and SD the standard deviation.

Table 4 shows the correlation matrix of all the variables in the regression model.

TABLE 4: Correlation matrix

	ADJ91	ADJ95	EP	GOVT1	GOVCTRL	GOVT20	GOVT3	GOVT5	ROA	D2E	M2B	QRatio	LogAtivo	BIG4	NDGC
ADJ91	1														
ADJ95	0,910	1													
EP	0,022	0,018	1												
GOVT1	-0,092	-0,074	-0,072	1											
GOVCTRL	-0,092	-0,074	-0,072	1,000	1										
GOVT20	-0,059	-0,035	-0,032	0,893	0,893	1									
GOVT3	-0,012	-0,012	-0,033	0,699	0,699	0,782	1								
GOVT5	0,014	-0,004	-0,018	0,672	0,672	0,752	0,961	1							
ROA	-0,056	-0,036	0,278	0,024	0,024	0,036	0,058	0,060	1						
D2E	-0,020	0,021	-0,042	-0,097	-0,097	-0,080	-0,087	-0,092	-0,182	1					
M2B	0,039	0,019	0,041	-0,133	-0,133	-0,124	-0,091	-0,078	0,094	0,022	1				
QRatio	0,071	0,041	0,210	-0,079	-0,079	-0,076	0,003	0,019	0,277	-0,148	0,743	1			
LogAtivo	0,146	0,159	0,149	0,250	0,250	0,281	0,340	0,358	0,187	-0,010	-0,129	0,097	1		
BIG4	0,061	0,037	0,198	0,121	0,121	0,138	0,211	0,220	0,270	-0,153	0,040	0,153	0,519	1	
NDGC	0,155	0,141	0,169	0,057	0,057	0,093	0,167	0,193	0,093	-0,151	0,100	0,179	0,518	0,421	1

The result of the correlation matrix of the variables in the empirical model (TABLE 5) shows a slight negative correlation between *discretionary accruals* (ADJ91 and ADJ95) and the state participation variables (GOV), leading us to infer that state participation leads to lower levels of earnings management in Brazilian companies and, therefore, better earnings quality, in line with the results of research on Chinese companies carried out by Wang and Yung (2011). It is worth noting that both measures of accruals show similar results, confirming their robustness.

According to the literature, one of the factors that we believe may lead to this result is the fact that the government is an institutional shareholder, a context that can lead to lower levels of earnings management (Hadani et al., 2011). In addition, the incentive structure in which SOEs

are inserted, where there are no property rights (performance bonuses) assigned to managers and there is less pressure to meet market analyst targets, means that managers have fewer incentives to manage results.

In line with the international literature, the PE variable shows a weak negative correlation with the state participation variables, which indicates lower sustainability of profits in companies in which the government is a shareholder and, consequently, lower quality of profits. Considering that companies manage earnings to reduce earnings variability (*smoothness*), the fact that Brazilian SOEs have less earnings management may justify this result.

When we look at the correlation between the control variables used in the model and the state participation variables, we see that companies in which the government has a greater stake have higher profitability, since the ROA variable and the GOV variables have positive values. The control variables for market value and growth opportunity (B2M and QRatio) both show a negative correlation with the GOV variables, which leads us to infer that companies in which the government is a shareholder have lower market values and growth potential. In this sense, we attribute this result to the fact that these companies suffer less pressure from investors to achieve market goals.

The LogAssets variable shows a slight positive correlation with the state participation variables, which indicates that, in the Brazilian scenario, companies in which the government participates are larger in terms of assets. The governance variables (BIG4 and NDGC) also both show a positive correlation with the GOV variables, which indicates better governance in companies with state participation. Also among the control variables, it is worth noting the slight negative association between D2E and the GOV variables, which leads us to infer that companies in which the government participates have lower indebtedness or are more conservative in their financing decisions. In order to compare the effects of government participation on earnings quality in SOEs and POEs, the difference of means test was carried out and the results are shown in Table 5 below.

TABLE 5: Difference of Means Test

Panel A: 1st largest shareholder

Variables	SOEs (A)			POEs (B)			Difference of Averages	
	N	Average	DP	N	Average	DP	(B - A)	p-value
ADJ91	2416	0,009	0,018	14615	0,013	0,022	0,004	0,000***
ADJ95	2416	0,008	0,017	14615	0,012	0,021	0,004	0,000***
EP	1513	0,226	0,512	6744	0,322	0,582	0,096	0,000***

ROA	2416	0,068	0,094	14615	0,05	0,096	-0,019	0,000***
D2E	2416	2,445	3,676	14615	2,848	4,283	0,403	0,000***
M2B	1823	0,808	1,238	10462	0,986	1,446	0,178	0,000***
QRatio	1823	1,008	0,461	10461	1,009	0,499	0,001	0,92
LogActive	2416	14,685	1,953	14615	13,329	1,98	-1,356	0,000***
BIG4	1523	0,76	0,427	7869	0,609	0,488	-0,151	0,000***
NDGC	1522	0,432	0,499	7235	0,459	0,495	-0,028	0,048**

Painel B: Controle Acionário

Variables	SOEs (A)			POEs (B)			Difference of Averages	
	N	Average	DP	N	Average	DP	(B - A)	p-value
ADJ91	1904	0,009	0,018	14615	0,013	0,022	0,004	0,000***
ADJ95	14615	0,012	0,018	1904	0,007	0,021	0,004	0,000***
EP	1145	0,189	0,493	6744	0,322	0,582	0,133	0,000***
ROA	1904	0,063	0,091	14615	0,05	0,096	-0,013	0,000***
D2E	1904	2,442	3,908	14615	2,848	4,283	0,406	0,000***
M2B	1442	0,621	0,892	10462	0,986	1,446	0,365	0,000***
QRatio	1442	0,949	0,389	10461	1,009	0,499	0,06	0,000***
LogActive	1904	14,666	1,882	14615	13,329	1,98	-1,337	0,000***
BIG4	1167	0,753	0,431	7869	0,609	0,488	-0,144	0,000***
NDGC	1186	0,394	0,489	7235	0,432	0,495	0,038	0,015**

Painel C: Propriedade de 20%+ ações

Variables	SOEs (A)			POEs (B)			Difference of Averages	
	N	Average	DP	N	Average	DP	(B - A)	p-value
ADJ91	2870	0,010	0,019	14161	0,013	0,022	0,003	0,000***
ADJ95	2870	0,009	0,019	14161	0,012	0,021	0,003	0,000***
EP	1690	0,264	0,518	6567	0,315	0,583	0,051	0,001***
ROA	2870	0,067	0,091	14161	0,049	0,097	-0,017	0,000***
D2E	2870	2,74	4,243	14161	2,802	4,197	0,062	0,472
M2B	2123	0,885	1,459	10162	0,976	1,409	0,091	0,007***
QRatio	2123	1,003	0,469	10161	1,01	0,498	0,008	0,518
LogActive	2870	14,649	1,987	14161	13,292	1,87	-1,357	0,000***
BIG4	1754	0,745	0,436	7638	0,608	0,488	-0,137	0,000***
NDGC	1814	0,483	0,5	6943	0,424	0,494	-0,059	0,000***

Painel D: Três Maiores Acionistas

Variables	SOEs (A)			POEs (B)			Difference of Averages	
	N	Average	DP	N	Average	DP	(B - A)	p-value
ADJ91	4377	0,011	0,020	12654	0,013	0,022	0,002	0,000***
ADJ95	4377	0,010	0,020	12654	0,012	0,021	0,002	0,000***
EP	2448	0,287	0,522	5809	0,312	0,59	0,025	0,074*
ROA	4377	0,067	0,095	12654	0,047	0,096	-0,019	0,000***
D2E	4377	2,719	4,184	12654	2,816	4,212	0,097	0,188
M2B	3338	0,931	1,45	8947	0,971	1,406	0,039	0,173
QRatio	3338	1,019	0,459	8946	1,005	0,505	-0,014	0,174
LogActive	4377	14,445	1,928	12654	13,201	1,969	-1,244	0,000***
BIG4	2568	0,773	0,419	6824	0,581	0,493	-0,192	0,000***
NDGC	2545	0,543	0,498	6212	0,393	0,488	-0,151	0,000***

Painel E: Cinco Maiores Acionistas								
Variables	SOEs (A)			POEs (B)			Difference of Averages	
	N	Average	DP	N	Average	DP	(B - A)	p-value
ADJ91	4684	0,011	0,020	12347	0,013	0,022	0,002	0,000***
ADJ95	4684	0,010	0,019	12347	0,012	0,021	0,002	0,000***
EP	2608	0,29	0,523	5649	0,311	0,592	0,021	0,129
ROA	4684	0,067	0,093	12347	0,047	0,096	-0,02	0,000***
D2E	4684	2,834	4,344	12347	2,775	4,151	-0,059	0,416
M2B	3590	0,93	1,423	8695	0,973	1,416	0,043	0,127
QRatio	3590	1,023	0,456	8694	1,003	0,508	-0,02	0,046
LogActive	4684	14,483	1,885	12347	13,156	1,966	-1,327	0,000***
BIG4	2706	0,778	0,415	6686	0,574	0,494	-0,204	0,000***
NDGC	2642	0,551	0,497	6115	0,387	0,487	-0,164	0,000***

*, ** and *** represent significance levels of 10%, 5% and 1%, respectively.

According to the results presented in TABLE 5, the discretionary *accruals* variable shows a statistically significant difference with a confidence level of 1%, in the five state participation variables, leading us to infer that state participation affects the quality of earnings for the variable that measures earnings management, so it can be inferred that state participation affects earnings management in Brazilian companies as has been shown in previous research (Wang and Yung, 2011; Ben-Nasr et al, 2015).

For the PE variable, the results show that there is a significant difference for GOVT1, GOVCTRL and GOVT20. Therefore, we can infer that, for these variables, state participation affects the persistence of profits, in line with the results presented by Ben-Nasr et al. (2015) and Alipour et al. (2014). However, as the level of state participation decreases, the difference between SOEs and POEs is no longer statistically significant. This result leads us to infer that state participation has an influence on the persistence of profits in the Brazilian scenario.

4.2 Analysis of Multiple Regression Results

For the empirical analysis, five models were created for each of the four earnings quality variables, giving a total of twenty regression models shown in Tables 6 and 7, where the results of the multiple regression are also presented below.

TABLE 6: MULTIPLE REGRESSION - PROXY: DISCRETIONARY ACCRUALS

Painel A: *Accruals* Discricionários - Modelo Jones (1991)

Variables	(1)	(2)	(3)	(4)	(5)
GOVT1	-0,007	-	-	-	-
	(0,000)***	-	-	-	-
GOVCTRL	-	-0,006	-	-	-
	-	(0,000)***	-	-	-
GOVT20	-	-	-0,006	-	-
	-	-	(0,000)***	-	-
GOVT3	-	-	-	-0,005	-
	-	-	-	(0,000)***	-
GOVT5	-	-	-	-	-0,004
	-	-	-	-	(0,000)***
ROA	-0,028	-0,026	-0,028	-0,028	-0,028
	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***
D2E	-0,000	-0,000	-0,000	-0,000	-0,000
	(0,122)	(0,094)*	(0,196)	(0,215)	(0,227)
M2B	0,000	0,000	0,000	0,000	0,000
	(0,310)	(0,097)*	(0,260)	(0,227)	(0,232)
QRatio	0,004	0,003	0,004	0,004	0,004
	(0,000)***	(0,001)***	(0,000)***	(0,000)***	(0,000)***
LogActive	0,001	0,001	0,001	0,001	0,001
	(0,000)***	(0,000)***	(0,001)***	(0,002)***	(0,003)***
BIG4	0,001	0,001	0,001	0,001	0,001
	(0,258)	(0,399)	(0,268)	(0,193)	(0,200)
NDGC	0,005	0,005	0,005	0,006	0,006
	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***
R^2	0,064	0,064	0,060	0,058	0,056
R^2 Adjusted	0,062	0,062	0,058	0,056	0,054
Prob > F	0,000	0,000	0,000	0,000	0,000

The data above are the results of the empirical models presented below:

Panel A Model (1): $ADJ91_{i,t} = \beta_0 + \beta_1 GOVT1_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel A Model (2): $ADJ91_{i,t} = \beta_0 + \beta_1 GOVCTRL_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel A Model (3): $ADJ91_{i,t} = \beta_0 + \beta_1 GOVT20_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel A Model (4): $ADJ91_{i,t} = \beta_0 + \beta_1 GOVT3_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel A Model (5): $ADJ91_{i,t} = \beta_0 + \beta_1 GOVT5_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel B: Discretionary Accruals - Modified Jones Model (DeChow et al.,1995)

Variables	(1)	(2)	(3)	(4)	(5)
GOVT1	-0,006	-	-	-	-
	(0,000)***	-	-	-	-
GOVCTRL	-	-0,005	-	-	-
	-	(0,000)***	-	-	-
GOVT20	-	-	-0,046	-	-
	-	-	(0,000)***	-	-
GOVT3	-	-	-	-0,004	-
	-	-	-	(0,000)***	-
GOVT5	-	-	-	-	-0,004
	-	-	-	-	(0,000)***

ROA	-0,022 (0,000)***	-0,021 (0,000)***	-0,022 (0,000)***	-0,022 (0,000)***	-0,022 (0,000)***
D2E	-0,000 (0,766)	-0,000 (0,760)	-1.610 (0,985)	-4,830 (0,956)	-7,640 (0,931)
M2B	0,000 (0,201)	0,000 (0,108)	0,000 (0,174)	0,000 (0,141)	0,000 (0,135)
QRatio	0,002 (0,010)**	0,002 (0,017)**	0,002 (0,010)**	0,002 (0,009)**	0,002 (0,010)**
LogActive	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***
BIG4	0,001 (0,386)	0,000 (0,490)	0,001 (0,397)	0,001 (0,302)	0,000 (0,302)
NDGC	0,005 (0,000)***	0,005 (0,000)***	0,005 (0,000)***	0,005 (0,000)***	0,005 (0,000)***
R^2	0,052	0,052	0,047	0,049	0,049
R^2 Adjust	0,050	0,050	0,046	0,047	0,047
Prob > F	0,000	0,000	0,000	0,000	0,000

Panel B Model (1): $ADJ95_{i,t} = \beta_0 + \beta_1 GOVT1_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel B Model (2): $ADJ95_{i,t} = \beta_0 + \beta_1 GOVCTRL_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel B Model (3): $ADJ95_{i,t} = \beta_0 + \beta_1 GOVT20_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel B Model (4): $ADJ95_{i,t} = \beta_0 + \beta_1 GOVT3_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel B Model (5): $ADJ95_{i,t} = \beta_0 + \beta_1 GOVT5_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

The results in TABLE 6 - Panels A and B - show that, for the earnings quality *proxy* discretionary *accruals* (ADJ91 and ADJ95), the coefficients of all the state participation variables are significant and negative, which leads us to accept **H1, thus** contradicting the results found in the *cross-country* research carried out by Ben-Nasr et al. (2015), but in line with the results presented by Wang and Yung (2011) with samples of Chinese companies. We attribute this result to the fact that managers in SOEs are less exposed to the pressures of the capital market to beat targets (*target beating*) and analysts' forecasts, and therefore have fewer incentives to manage results in order to achieve specific performance targets (Wang and Yung, 2011).

For this earnings quality *proxy*, the coefficients of the control variables are significant for the ROA, QRatio, LogAtivo and NDGC variables, leading us to infer that profitability, growth opportunity, company size and governance levels affect earnings management in the Brazilian context, in line with the literature.

TABLE 7: REGRESSION RESULTS - PROXY: EP

Variables	(1)	(2)	(3)	(4)	(5)

GOVT1	-0,133 (0,000)***	- -	- -	- -	- -
GOVCTRL	- -	-0,126 (0,000)***	- -	- -	- -
GOVT20	- -	- -	-0,075 (0,000)***	- -	- -
GOVT3	- -	- -	- -	-0,117 (0,000)***	- -
GOVT5	- -	- -	- -	- -	-0,103 (0,000)***
ROA	1,289 (0,000)***	1,283 (0,000)***	1,289 (0,000)***	1,282 (0,000)***	1,280 (0,000)***
D2E	0,012 (0,000)***	0,011 (0,000)***	0,012 (0,000)***	0,012 (0,000)***	0,012 (0,000)***
M2B	-0,102 (0,000)***	-0,103 (0,000)***	-0,103 (0,000)***	-0,105 (0,000)***	-0,104 (0,000)***
Qratio	0,362 (0,000)***	0,366 (0,000)***	0,365 (0,000)***	0,373 (0,000)***	0,374 (0,000)***
LogActive	-0,009 (0,212)***	-0,010 (0,177)	-0,012 (0,093)*	-0,008 (0,241)	-0,009 (0,201)
BIG4	0,117 (0,000)***	0,114 (0,000)***	0,117 (0,000)***	0,123 (0,000)***	0,122 (0,000)***
NDGC	0,119 (0,000)***	0,124 (0,000)***	0,120 (0,000)***	0,125 (0,000)***	0,127 (0,000)***
R^2	0,145	0,146	0,140	0,145	0,143
R^2 Adjust	0,143	0,143	0,137	0,143	0,141
Prob > F	0,000	0,000	0,000	0,000	0,000

The data above are the results of the empirical models presented below:

Panel C Model (1): $EP_{i,t} = \beta_0 + \beta_1 GOVT1_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel C Model (2): $EP_{i,t} = \beta_0 + \beta_1 GOVCTRL_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel C Model (3): $EP_{i,t} = \beta_0 + \beta_1 GOVT20_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel C Model (4): $EP_{i,t} = \beta_0 + \beta_1 GOVT3_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

Panel C Model (5): $EP_{i,t} = \beta_0 + \beta_1 GOVT5_{i,t} + \beta_2 ROA_{i,t} + \beta_3 D2E_{i,t} + \beta_4 M2B_{i,t} + \beta_5 QRatio_{i,t} + \beta_6 LogAtivo_{i,t} + \beta_7 BIG4_{i,t} + \beta_8 NDGC_{i,t} + \varepsilon_{i,t}$

*, ** and *** denote confidence levels of 10%, 5% and 1%, respectively.

In the table above, the coefficients of the variables are shown in the top row and the p-values of the variables are shown in brackets in the bottom row.

TABLE 7 shows the regression results for the EP - *earnings persistence proxy*. This variable assesses the persistence of the company's earnings, in the sense that greater persistence implies greater sustainability and, therefore, the possibility of making more accurate earnings

projections (Sousa and Galdi, 2016). This leads to a higher market value for companies with more sustainable earnings, which is why the literature establishes it as a *proxy for* earnings quality.

According to the results presented in TABLE 7, for the PE variable, the coefficients of all the state participation variables are significant and negative, leading us to reject **H2, which** states that SOEs have greater sustainability of results, which corroborates the results presented by Ben-Nasr et al. (2015).

Considering that lower earnings persistence is indicative of lower earnings quality, the results for the two *proxies* (discretionary *accruals* and *earnings persistence*) used in this research are therefore conflicting.

However, when analyzing the results in opposite directions, we consider that in the Brazilian context, a scenario presented in Dechow et al. (2010) can be applied in which discretionary *accruals* are used to smooth profits (what the authors call "*abnormal smoothness*"), and consequently, to improve the persistence of profits.

In this way, it can be considered that the absence of earnings smoothing to present better company sustainability denotes more reliable information, i.e. without data manipulation, which ultimately results in better quality accounting information.

Dechow et. al. (2010) point out that abnormal smoothing is considered to be a level of earnings management. Considering lower levels of discretionary *accruals* in SOEs, we can infer that lower earnings persistence in Brazilian SOEs can be attributed to less earnings management by these companies, however, further studies are needed to evaluate this specific context.

Another fact to be considered for the lower persistence of profits in Brazilian SOEs is the fact that Brazilian companies have a high concentration of ownership which, according to Sousa and Galdi (2016), leads to lower persistence of profits and, consequently, lower sustainability of future results.

Consistent with the results of the previous regressions, the regression of the EP earnings quality *proxy* shows significant coefficients for all the control variables (with the exception of LogAtivo), corroborating the notion that, in Brazilian companies, earnings persistence affects market value, profitability, indebtedness and governance levels.

In conclusion, the regressions of the two earnings quality proxies are conflicting, with SOEs showing lower levels of discretionary *accruals* (earnings management) but lower earnings persistence.

In this scenario, we believe that lower earnings persistence may be associated with lower

earnings management for earnings smoothing, which may lead to lower earnings persistence. However, further studies are needed to evaluate this scenario.

5. CONCLUSION

The aim of this study is to analyze the effects of state participation on earnings quality in Brazilian companies listed on B3. This research contributes to the earnings quality literature by expanding existing studies on the subject in the Brazilian institutional environment. Although there are studies with samples of companies in emerging economies, as far as we know, there are no studies in this sense with samples of Brazilian companies in the Brazilian and international literature. In addition, this study sheds light on the real implications of state participation in the Brazilian capital market, thereby helping to inform investors about the quality of earnings in these companies.

The data analysis carried out in this study shows conflicting results with those of previous studies in different scenarios. Most of the international literature on the subject (the subject is still unexplored in national research) shows greater earnings management in companies in which the government is a shareholder, which they attribute to the fact that these companies are less transparent and have worse governance.

However, using discretionary *accruals* as a measure, the results of this study point in the opposite direction, i.e. the greater the state participation, the lower the earnings management in Brazilian companies, corroborating the results of research carried out with a sample of Chinese companies (Wang and Yung, 2011).

The incentive structure peculiar to these entities, such as the absence of *stock options for* managers, as well as the fact that these companies exert less pressure on managers to achieve earnings targets, may explain these results. In addition, we also consider the fact that Brazilian SOEs (including mixed-capital companies and other companies in which the government has indirect control) are subject to public law rules and, therefore, to external control by the Federal Court of Auditors to be a determining factor in this result.

The results of the EP *proxy* regression show that, in the Brazilian scenario, SOEs have lower earnings persistence, which leads to lower accuracy in projecting future results. Understanding the reason for this evidence requires further study, but may be related to the quality of analysts who follow the companies and to projections voluntarily provided to the market by private companies in greater volume than those controlled by the government.

Another factor to consider is the lower levels of earnings management to smooth earnings in these companies, which may result in lower earnings persistence.

The analysis of the results found leads to the following conclusions: in the Brazilian scenario, SOEs have lower levels of earnings management, which leads to greater transparency and higher quality earnings, and consequently greater reliability of the data presented. The lower persistence of earnings in Brazilian SOEs leads us to infer that the concentration of capital, characteristic of the Brazilian scenario, affects the accuracy of predicting future results of these companies.

In conclusion, according to the results presented in this paper, we can see that the Political Interference Hypothesis formulated by Ben-Nasr et al. (2015) applies to the reality of the Brazilian scenario, however, in the opposite direction to the results presented by the authors of greater earnings management and lower earnings quality. In this sense, it can be inferred that, in Brazilian SOEs, state participation contributes to better earnings quality, greater investor response to earnings, but less persistence and sustainability of reported earnings.

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