UNIVERSIDADE FEDERAL DE MINAS GERAIS

FACULDADE DE CIÊNCIAS ECONÔMICAS

CENTRO DE PÓS-GRADUAÇÃO E PESQUISAS EM ADMINISTRAÇÃO

Rafaela de Oliveira Vitória

SHOULD STATE-OWNED ENTERPRISES BE PRIVATIZED IN DEVELOPING COUNTRIES? EVIDENCE FROM BRAZIL

Belo Horizonte

2022

Rafaela de Oliveira Vitória

SHOULD STATE-OWNED ENTERPRISES BE PRIVATIZED IN DEVELOPING COUNTRIES? EVIDENCE FROM BRAZIL

Final Version

PhD Thesis presented to the Center for Graduate Studies and Research in Administration at the Federal University of Minas Gerais

Supervisor: Aureliano Angel Bressan

Belo Horizonte

2022

Ficha Catalográfica

V845s
2022

Vitoria, Rafaela de Oliveira.
Should state-owned enterprises be privatized in developing countries?[manuscrito]: evidence from Brazil / Rafaela de Oliveira Vitoria. – 2022.
94 f., il., gráfs e tabs.

Orientador: Aureliano Angel Bressan.

Tese (doutorado) - Universidade Federal de Minas Gerais, Centro de Pós-Graduação e Pesquisa em Administração.
Inclui bibliografia (f. 75-83) e anexos.

1. Empresas Estatais – Brasil – Teses. 2. Privatização – Teses. 3. Finanças corporativas– Teses. I. Bressan, Aureliano Angel. II. Universidade Federal de Minas Gerais. Centro de Pós-Graduação e Pesquisa em Administração. III. Título.

CDD: 658

Elaborado por Adriana Kelly Rodrigues CRB-6/2572
Biblioteca da FACE/UFMG. – AKR/033/2022

UNIVERSIDADE FEDERAL DE MINAS GERAIS
FACULDADE DE CIÊNCIAS ECONÔMICAS
CENTRO DE PÓS-GRADUAÇÃO E PESQUISAS EM ADMINISTRAÇÃO
PROGRAMA DE PÓS-GRADUAÇÃO EM ADMINISTRAÇÃO

ATA DE DEFESA DE TESE

ATA DA DEFESA DE TESE DE DOUTORADO EM ADMINISTRAÇÃO da Senhora **RAFAELA DE OLIVEIRA VITORIA**, REGISTRO Nº 286/2022. No dia 21 de fevereiro de 2022, às 14:00 horas, reuniu-se remotamente, por videoconferência, a Comissão Examinadora de Tese, indicada pelo Colegiado do Centro de Pós-Graduação e Pesquisas em Administração do CEPEAD, em 01 de fevereiro de 2020, para julgar o trabalho final intitulado "Should state-owned enterprises be privatized in developing countries? Evidence from Brazil**"**, requisito para a obtenção do **Grau de Doutora em Administração,** linha de pesquisa: **Finanças.** Abrindo a sessão, o Senhor Presidente da Comissão, Prof. Dr. Aureliano Angel Bressan, após dar conhecimento aos presentes o teor das Normas Regulamentares do Trabalho Final, passou a palavra à candidata para apresentação de seu trabalho. Seguiu-se a arguição pelos examinadores com a respectiva defesa da candidata. Logo após, a Comissão se reuniu sem a presença da candidata e do público, para julgamento e expedição do seguinte resultado final:

(X) APROVAÇÃO

( ) REPROVAÇÃO

O resultado final foi comunicado publicamente à candidata pelo Senhor Presidente da Comissão. Nada mais havendo a tratar, o Senhor Presidente encerrou a reunião e lavrou a presente ATA, que será assinada por todos os membros participantes da Comissão Examinadora. Belo Horizonte, 21 de fevereiro de 2022.

Prof. Dr. Aureliano Angel Bressan
ORIENTADOR - CEPEAD/UFMG

Prof. Dr. Francisco Vidal Barbosa
CEPEAD/UFMG

Prof. Dr. Robert Aldo Iquiapaza Coaguila
CEPEAD/UFMG

Prof. Dr. Alexandre Vasconcelos Aronne
Skema Business School

Prof. Dr. Sérgio Giovanetti Lazzarini
Insper Instituto de Ensino e Pesquisa

Documento assinado eletronicamente por **Aureliano Angel Bressan**, **Professor do Magistério Superior**, em 21/02/2022, às 16:59, conforme horário oficial de Brasília, com fundamento no art. 5º do Decreto nº 10.543, de 13 de novembro de 2020.

Documento assinado eletronicamente por **Alexandre Vasconcelos Aronne**, **Usuário Externo**, em 21/02/2022, às 17:07, conforme horário oficial de Brasília, com fundamento no art. 5º do Decreto nº 10.543, de 13 de novembro de 2020.

AKNOWLEDGEMENT

I would like to thank those who helped me during this research process, particularly Prof. Aureliano Bressan, whose advisory was fundamental throughout this journey. I would also like to thank Cepead-UFMG and its faculty, for giving me the opportunity to complete this research. And a special thanks to my husband and two children, for their patience and understanding during these past four year.

ABSTRACT

The rise and fall of state capitalism in Brazil have reopened the debate on privatization, a highly polarized topic in the country among economists and policy makers. This study investigated the effects of state ownership on firm performance, trough observable variables such as profitability, valuation, and labor efficiency using econometric models with panel data and dynamic models to control for endogeneity. The results showed that SOEs underperform privatized peers in almost all measures. State control has a significant negative impact on companies' profitability, labor efficiency, and market values. The negative ownership performance relationship can be attributed to the ingrained political policies that abuse state resources and show no constraints, particularly in over employment. This study focused on the aggregate impact of SOEs, and not on their individual performances. The results can shed new light on the issue whether government participation in corporations is worthy as an economic public policy, and at what cost. Privatized entities' performance demonstrate that companies are better managed, generate higher profits, invest more, and ultimately employ more people as they expand. For investors, it is clear that SOEs in Brazil underperform, and that fact is reflected in recurrent discounted market valuations despite the economic cycle or government orientation. Therefore, the privatization debate in Brazil can be enlightened with relevant information for policy makers.

Key Words: State Owned Enterprises, Privatization, Corporate Finance, Profitability, GMM

ABSTRATO

A ascensão e queda do capitalismo de Estado no Brasil reabriu o debate sobre a privatização, um tema bastante polarizado no país tanto entre economistas e formuladores de políticas públicas. Este estudo investigou os efeitos da propriedade estatal no desempenho das empresas, por meio de variáveis como lucratividade, eficiência do trabalho e valorização das ações usando modelos econométricos com dados em painel e modelos dinâmicos para controle de endogeneidade. Os resultados mostraram que as estatais têm desempenho inferior aos seus pares privatizados em praticamente todas as medidas. O controle estatal tem um impacto negativo significativo na lucratividade, na eficiência do trabalho e nos valores de mercado das empresas. Essa relação negativa pode ser atribuída às políticas arraigadas que abusam dos recursos do Estado, particularmente no excesso de emprego nas empresas. Este estudo concentrou-se no impacto agregado das empresas estatais, e não em seus desempenhos individuais. Os resultados pretendem esclarecer questionamentos sobre a participação do governo na gestão de empresas, como política pública e a que custo. A análise do desempenho das empresas privatizadas demonstra que elas são mais bem geridas, geram maior retorno a seus acionistas, investem mais e, no longo prazo, empregam mais pessoas à medida expandem seus negócios. Para os investidores, fica claro que as empresas estatais no Brasil apresentam desempenho inferior, e esse fato se reflete em recorrentes precificações de mercado descontadas, a despeito de ciclos econômicos ou da orientação política do governo. Portanto, o debate sobre privatizações no Brasil ganha novos argumentos com informações relevantes para os formuladores de políticas públicas.

Palavras-Chaves: Empresas Estatais, Privatização , Finanças Corporativas, Rentabilidade, GMM

List of Tables

Table 1 – List of Companies
Table 2 - Variables and Literature Reference
Table 3 – Sample Composition
Table 4 - Descriptive Statistics for SOEs
Table 5 - Descriptive Statistics for Privatized Companies
Table 6 – Univariate and Mann-Whitney Tests
Table 7 – Regression Results – Firm Performance
Table 8 – Regression Results – ESG
Table 9 – Profitability Regression Results – Balanced Panel without Outliers
Table 10 – Panel Regressions endogeneity Test
Table 11 – GMM Regression Results
Table 12 – GMM Results with external Instrumental Variables
Table 13 – GMM Results with external Instrumental Variables - Balanced Panel
Table 14 – Scenario Change Summary
Table 15 – Difference-in-difference estimates
Table 16 – Difference-in-difference estimates without control variables
Table 17 – Shapiro and F-Test
Table 18 - ROA Regressions Results
Table 19 - ROA Regressions Tests
Table 20 - ROE Regressions Results
Table 21 – ROE Regressions Tests
Table 22 - OP Regressions Results
Table 23 – OP Regressions Tests
Table 24 - DY Regressions Results
Table 25 – DY Regressions Tests
Table 26 - SEf Regressions Results
Table 27 – SEf Regressions Tests
Table 28 - AEf Regressions Results
Table 29 – AEf Regressions Tests
Table 30 - MTB Regressions Results
Table 31 – MTB Regressions Tests
Table 32 - ESG Regressions Results

Table 33 – ESG Regressions Tests
Table 34 – DiD Results With Balanced Panel without Outliers
Table 35 – DiD Results With Balanced Panel Without Control Variables

List of Abbreviations

CVM – Comissão de Valores Mobiliários

BNDES - Banco Nacional de Desenvolvimento Social

CIS - Commonwealth of Independent States

CSR – Corporate and Social Responsibility

DiD – Difference in difference

DY – Dividend Yield

CAPEX – Capital Expenditure

ESG – Environmental Social and Governance

FE – Fixed Effects

GDP – Gross Domestic Product

GMM – Generalized Method of Moments

IPO – Initial Public Offering

MTB – Market to Book

OECD – Organisation for Economic Co-operation and Development

OLS - Ordinary Least Square

OP – Operating Profit

PND – Programa Nacional de Privatização

RE – Random Effects

ROA – Return on Assets

ROE – Return on Equity

SIP – Share Issuance Privatization

SOE – State-Owned Enterprise

TWFE – Two-way Fixed Effects

WB – World Bank

WIR – World Investment Report

TABLE OF CONTENTS

1 INTRODUCTION 11

1.1 Research Question 12
1.2 General Objective 12
1.3 Relevance and Justification 13
1.4 Why Brazil? 14

2 THEORETICAL FRAMEWORK 16

2.1 Theory of Public Goods 16
2.2 Principal Agent Theory and SOEs 19
2.3 Economic Theory of Privatization 21

3 REVIEW OF EMPIRICAL LITERATURE 23

3.1 Worldwide Evidence of the Effects of Privatizations 23
3.2 The New Wave of State Capitalism 31
3.3 The Benefits of SOEs 36
3.4 Selection Bias and Endogeneity of Ownership Structure 39

4. HYPOTHESES 41

5. DATA AND METHODOLOGY 43

5.1. Data and Sample Selection 43
5.2. Identification Strategy 45
5.3 Variables Description 46
5.4 Methodology 49
5.4.1 Panel Regressions 49
5.4.2 General Method of Moments 50
5.4.3 Difference in Difference 50

6. RESULTS 51

6.1 Descriptive Statistics and Univariate Test 51
6.2 Panel Regression Results 58
6.3 Panel Regressions Robustness Checks 62
6.4 Endogeneity and the Dynamic GMM model 63

6.5 Changes in the macro and regulatory scenario and Difference in Differences analysis..... 71

7. CONCLUSION..... 73

8. REFERENCES 75

APENDIX 1..... 84

APENDIX 2..... 93

1. INTRODUCTION

Throughout history, scholars and policy makers have debated the role of government in the economy. The literature on the economics of ownership and empirical studies have documented that, in most part, privatization leads to significant improvements in performance of state-owned SOE enterprises (Boardman and Vining, 1989; Boubakri and Cosset, 1998; Schleifer, 1998; Dewenter and Malatesta, 2001; Megginson, 2001; Djankov and Murrel, 2002; D'Souza et al., 2005; Gupta, 2005; Megginson et al., 2004; Estrin et al., 2016). Despite the substantial empirical evidence of performance improvements after privatization, the debate over the relevance of the government, as a shareholder and controller, remains polarized, and state interference in the economy is nonetheless an open issue for debate. The discussion over the growth of the state and its role in the economy is renewed with the rising issues of climate change, the aging of the population, and the recent impacts of the COVID-19 pandemic, all matters in which the state has promptly stepped up and provided necessary solutions with no budget constraints. However, the debate on government interference in the market remains. Perhaps, the issue is not the amount of interference but its nature: with entrenched bureaucracy and inefficiency, should the state operate companies?

The subject of this study is then to investigate the effects of state ownership on firm performance, through observable variables that are proxies for profitability, valuation, and labor efficiency. For the purpose of this study, state ownership is defined as majority control with direct ownership of 50% +1 of voting shares. In the academic literature, an extensive body of work has compared the performance of SOEs before and after privatization and, to a lesser extent, SOEs to private or privatized peers. The vast majority of the results have pointed to significant differences in efficiency and profitability, favoring privately-controlled companies. Several factors have been revealed, including agency theory, the lack of appropriate incentives and poor monitoring of managers, as SOEs pursue objectives other than profitability, such as social and political objectives. State control is an inefficient ownership form that results in poorer financial performance (Boubakri and Cosset, 1998; Schleifer, 1998; Dewenter and Malatesta, 2001; Megginson, 2001; Djankov and Murrel, 2002; D'Souza et al., 2005; Gupta, 2005; Megginson et al., 2004; Estrin et al., 2016; Bachiller, 2017; D'Souza and Nash, 2017; Boubakri et al., 2018; Lazzarini and Musacchio, 2018).

Political influence is especially evident in over-employment and ill-suited investments that meets the interests of voters, rather than those of shareholders. This moral hazard arises

from a monitoring gap that occurs when governments lack the incentives or skills, mostly due to political appointments, to supervise management. To a lesser extent, SOEs may also pursue social objectives, aimed at improving social welfare, or public economic policy, directing ineffective investments and uneconomical pricing policy (Borisova et al.,2015).

Margaret Thatcher popularized the term “privatization”, when she was the prime minister of the U.K. between 1979 and 1990, in reference to the procedures by which a government transfers ownership of assets and control of business to the private sector. Privatization commonly includes the outright sale of companies or assets, service concession, deregulation, and contracting out services to private providers with a change in the control of managers from politicians to private investors.

Despite more than three decades of privatizations worldwide, state capitalism still remains relevant in developed and developing countries, particularly considering the extensive government support given to companies since the 2008 global financial crisis. There are approximately 1500 state-owned multinationals, having more than 86,000 wholly- or partly-owned subsidiaries, of which nearly one-third are operated in European Union countries, and more than 50% of firms are headquartered in emerging economies (WIR, 2017).

1.1 Research Question

Brazil has a rich but understudied history with the rise and fall of SOEs. There were several important privatizations in the 1990s, followed by a growth in state capitalism and a substantial expansion of SOEs, which coincided with the economic growth in Brazil in the 2000s. In this context of ambiguous contribution and relevance, the comparison of SOEs and their privatized peers for the period from 2006 to 2020 is used to determine whether SOEs in Brazil underperform privatized peers in measures related to profitability, efficiency, market value and environmental social governance (ESG).

Therefore, this study explores the issues related to the following research question:

Do state owned companies underperform their privatized peers in Brazil?

1.2 General Objective

The general objective of this study is to analyze the differences in performance between Brazilian SOEs and their privatized peers.

To achieve this general objective, the following specific objectives were formulated in the context of the study:

1) Compare the financial performance and valuation of SOEs and privatized companies for a period comprising 15 years between 2006 and 2020, in different economic scenarios;
2) Investigate if there are any significant performance changes in SOEs after changes in regulations following a new reformist government in 2016.

1.3 Relevance and Justification

This study is motivated by the ongoing debate between economists, investors, and policy makers about the past or future benefits of privatization in Brazil. The Brazilian government has shifted from focusing on privatizations in the 1990s to leading state capitalism in the 2000s and 2010s. New governments at state and federal levels have only recently, since 2016, returned to privatizations with new programs to sell SOEs and other government assets. They have had little success so far. Despite the short-lived privatization program of the 1990s, for most of modern history, Brazil has predominantly pursued nationally driven economic public policies. The number of SOEs vary, but since the 1980s, there have been around 200. According to the most recent survey by the government, Brazil has 203 SOEs only at the deferral level (Boletim das Empresas Estatais Federais, 2019), and 23 state-controlled companies are listed in the Brazilian stock market.

Aguilera et al. (2021) added to the conventional view that SOEs underperform privatized companies with an emerging view that SOEs can accomplish better results, contingent on the type of government and regulatory institutions that control the SOEs. “The political ideology of the government, independently and in conjunction with political institutions, influences the willingness and ability of governments to use their ownership positions in SOEs to improve the financial performance of firms” (Aguilera et al., 2021, p. 2). According to the authors, governments’ political ideology is a core determinant defining the variations of state capitalism around the world. In a more economically liberal environment, SOEs are expected to behave more like private enterprises with the purpose of improving their financial performance. However, even when state executives agree on a policy agenda that leans toward profit maximization, political constraint could still negatively affect the implementation of such objectives. Investigating the case of Brazilian SOEs can then help to answer the

question of how the government has affected the performance of state-owned companies in emerging market economies.

1.4 Why Brazil?

State capitalism differs around the world, and prior studies have documented the variants of government ownership under different regulatory institutions. The bureaucratic form of control is particular to each government (La Porta, et al., 1999; Lazzarini and Musacchio, 2018). The extensive literature on the topic has left a gap regarding the Brazilian case. Despite being one of the largest emerging economies, Brazil has received restricted coverage from specialists in the field. The country was an unmistakable member of the state capitalism trend that dominated the 2000s, with the last nationally driven government, from 2003 to 2015, pouring resources into a handful of "state champions", publicly traded corporations that were financially backed by the state, and in some cases, by replacing direct with indirect ownership through Banco Nacional do Desenvolvimento Social (BNDES), the Brazilian national development bank, and state-controlled pension funds (Lazzarini, 2018).

The political changes in Brazil over the past 15 years offer a rich field for studying the results of privatization, as well as the maintenance and expansion of SOEs. Comparing the firm-level performance, measured by the return on investment, efficiency, and market valuation, between listed Brazilian SOEs and privatized firms, over such a long period of substantial political influence, will shed light on the differences that the state, as a controlling shareholder, can have on firms during different economic cycles and under different political influences. This period, from 2006 to 2020, offers a variety of economic exposures, from the global commodity boom and bust, the increase in SOE investments with special funding from BNDES, national content requirements, and a major corruption scandal, which occurred at the same time as the development of a stronger domestic capital market, allowing more investors to participate in public equity and debt investments. The analysis conducted over a longer period of time can identify economic and aggregate inefficiencies, which in turn will help formulate public policies.

The study of SOEs versus privatized companies in Brazil is also an important contribution to the literature on privatization. The state is a very large and powerful shareholder and, given the size of the country and its relevance and diversity, understanding the differences in the performance and valuation of privatized enterprises and SOEs offers a notable example.

According to Boubakri et al. (2018), SOEs account for nearly one-fifth of the world's stock market capitalization.

Capital market participants can also benefit from enhanced quantitative knowledge about performance differences. This knowledge can alleviate the valuation struggle that occurs because of SOEs' history of erratic performance over so many years. In Brazil, at the end of 2020, the combined market capitalization of state-owned companies was close to a proportion of 20% of the Ibovespa, Brazil's main stock market index. This is a relevant portion of the market for any investor interested in acquiring assets in the country. SOEs are distributed in key sectors, including commodities, utilities, and financial services. Analyzing the performance of Brazilian SOEs is of particular importance to investors in addition to public policymakers (Vitoria et al., 2020).

Privatization programs have slowed down globally and have even been suspended in several countries (Borisova et al., 2015). The government remains a shareholder both in fully state-owned and mixed ownership enterprises. Scandinavian countries, for example, still have numerous SOEs. Bortolotti and Faccio (2009) found that, in countries belonging to the Organization for Economic Co-operation and Development (OECD), "governments retained control of 62.4% of privatized firms." The use of sovereign wealth funds and share purchases, the introduction of golden shares owned by governments, and the use of indirect ownership and control mechanisms that obscure government ownership underline the reality of the continued influence of governments on corporations. Therefore, investigating the long-term impacts of privatization is highly relevant to the field of policy making, especially when these positive effects are counterbalanced by political pressures that work against privatization and other forms of economic liberalization (Dyck and Zingales, 2004; Dinç and Gupta, 2011).

In this sense, the data used in this study are a unique sample that represents the performance of SOEs and their privatized peers for a period of 15 years ranging from 2006 to 2020, an important period that includes the substantial growth of state capitalism and, in particular, the expansion of SOEs. Additionally, this period includes a change in political leadership in Brazil, from state-oriented growth to a potentially more liberal and reformist government, which according to Aguilera et al. (2021) leads to a more supportive environment in which SOEs can pursue financial performance objectives. Despite a campaign promoting a renewed privatization program, the current government has not made substantial progress in selling SOEs. More recently, the COVID-19 pandemic has also put privatization back in the public eye. Support has increased for a resilient and robust public sector that focuses on basic

social concerns, such as public health and welfare. Additionally, the increase in government debt during the pandemic will again put pressure on politicians to act fiscally responsible, and new privatizations may be considered to reduce public debt. The debate on privatization benefits in Brazil remains open and this study tries to shed some light on this issue.

Thus, this research is motivated by the long ongoing debate in Brazil between economists, market participants, and policy makers about the role of state as corporate owners and managers. It then tries to contribute to the debate through an empirical analysis which intends to expose the costs and benefits of former privatization proposals.

2. THEORETICAL FRAMEWORK

The theoretical debate on state ownership and privatization can be summarized into three themes: the theory of public goods, with the state being a provider of services in inefficient markets; principal-agent conflicts, with information asymmetry between ownership and control; and the theory of privatization, where bureaucrats focus on addressing objectives outside of profit maximization.

2.1 The Theory of Public Goods

The discussion of government participation in the economy is not recent. As Samuelson (1954) stated in the theory of public expenditure decades ago, economists favored government ownership of firms due to market inequities and imperfections. The origins of SOEs can be traced to the need for the state to provide services to the public, considering such inefficiencies as monopolies and externalities that the private sector could not overcome. As Shleifer (1998) pointed out, half a century ago, economists were quick to favor government ownership of firms as soon as any market imperfections, such as monopoly power or externalities, were even suspected.

According to Samuelson's (1954) definition, a public good could be considered one that, once produced for some consumers, could be consumed by additional consumers at no additional cost. The definition of public is even broader and related to the community; therefore, public or collective goods would be available for consumption to all citizens. A distinctive feature of such goods is that they are not used up in the process of being consumed or utilized as an input in a production process. A public good must also be of interest to more than one consumer or firm. This definition was of particular relevance to the history of public policy and

the creation of SOEs because they were believed to be inefficiently and uneconomically provided by private entities (Samuelson, 1954).

After World War II, states assumed enormous roles in production worldwide, owning everything from land, mines, factories, communications, banks, insurance companies, hospitals and schools (Belsey and Gathak, 2001). Even in market economies, state ownership met little resistance and questioning regarding an efficient allocation of resources by the public sector, consistent with the lack of controversy to state ownership. In economies such as Japan, the United States, and the Federal Republic of Germany, government ownership was restrained, while in others, such as Italy, France, and Austria, the state assumed control over substantial parts of production.

In some countries, state ownership was concentrated in so-called strategic sectors, such as energy, but in socialist economies, the state ended up owning everything. This lack of aversion to state ownership justified the creation of several SOEs in Brazil from 1950 to the 1980s, such as the public corporations in the energy sector, Eletrobras and Petrobras; in steel and mining, Vale, Usiminas, and CSN; and in the financial markets, Caixa and Banco do Brasil.

The privatization debate often links public or private ownership to competition. Hart et al. (1997) pointed out that misleading conclusions, such as SOEs that compete to serve the public, and the private sector that operates a monopolistic service, are based on the fundamental differences between private and public ownership. This concerns the allocation of control rights, rather than the degree of competition. According to Hart, public provision, as originally considered by Samuelson, is generally stronger when noncontractible cost reductions have large deleterious effects on quality, corruption in government procurement is a substantial problem, or when innovations are not important. The case for privatization, conversely, is stronger when quality reductions can be controlled through competition, when innovations are key, or when patronage is a problem inside the government. Competition strengthens the case for privatization, but only because the allocation of residual control rights is different (Hart et al., 1997). Shleifer (1998) later argues that cases where government ownership is superior are very limited, even in a country with good contract enforcement, and involve particular cases where soft incentives are extremely valuable.

Belsey and Gathak (2001) argued that, if the value created by an investment constitutes a public good, then the investor with the highest valuation should be the owner irrespective of the relative importance or other aspects, such as technology. Considering the baseline model

where the government and private sector are able to invest in a project, the owner should be the one that attaches the largest valuation to the project. In contrast to Samuelson, the authors provided a basis for systematic thinking about the ways in which the private sector can be involved in providing public goods.

Holcombe (1997) also criticized the theory of public goods because public goods can be produced by the private sector with more efficiency, derived from the ability to reveal consumer preferences from a profit motive, and many successful examples can be seen, ranging from television and radio broadcasts to computer software. Therefore, identifying a good as public was no longer sufficient to argue that market inefficiency considerations require public-sector production. Empirical studies of public sector outputs showed that, when the Samuelson's (1954) rigorous definition of publicness is used to characterize public-sector output, public-sector production does not have the characteristic of joint consumption as identified in Samuelson's theory.

Empirical evidence has shown that government output fails the test of publicness, as economists define the term, therefore, public goods theory can no longer be used as a basis for explaining or justifying public expenditures in enterprises. However, the theory of public goods persisted as a justification for government production. In addition, this persistence makes sense if the theory of public goods is considered a tool for governments to justify the legitimacy of their activities and because it is cheaper for governments if citizens do not question their decisions to maintain SOEs (Holcombe, 1997).

Samuelson (1954) refers to a lighthouse as an example of government activity, which is something that is justifiable because of its external effects. Lighthouses provide true social and economic benefits because they save lives and cargoes. However, their keepers cannot reach out to collect fees from the ships. The lighthouse has been often used in literature to justify the existence of state services, but Coase (1974) showed, through historical research, that even a lighthouse can be provided as a private service and concluded that economists should not use the lighthouse as an example of a service that could only be provided by the government. "I think we should try to develop generalizations which would give us guidance as to how various activities should best be organized and financed. But such generalizations are not likely to be helpful unless they are derived from studies of how such activities are actually carried out within different institutions' frameworks" (Coase, 1974, p. 374).

2.2 Principal Agent Theory and SOEs

Agency theory has been the leading theoretical approach in explaining the conflicts between shareholders and managers, and it has also been applied in the study of SOEs' inefficiencies. According to Jensen and Meckling (1976), conflicts of interest can be found between managers and controlling shareholders, as well as between controlling and minority shareholders, known as the principal-principal conflict. Despite being developed in the 1970s, agency theory is still key to the analysis of management issues in the modern corporation, either private- or state-controlled.

Corporate insiders can use assets for purposes that are detrimental to investors, such as diversions, excess employee benefits, or service contracts for themselves or corporations that they control at favorable terms (Jensen and Meckling, 1976). In the case of SOEs, these terms can be translated into signs of corruption. Within the context of SOEs, the private benefits of control can also extend to include a politician's use of company resources for political or personal advantages. Managers, appointed by politicians, can alternatively use corporate assets to pursue investment strategies that yield them political benefits. The private benefits of control were studied by La Porta (1999), Dyck and Zingales (2004), and D'Souza and Nash (2017), who pointed out the relevance of understanding a key issue in modern thinking about corporate governance and finance in state-controlled firms. When extracting personal and political gains, politicians may capture private benefits by engaging in related party transactions or direct expropriation of SOE resources (D'Souza and Nash, 2017). However, because private benefits of control are difficult to observe and quantify (Dyck and Zingales, 2004), state ownership is still defended around the world.

Although agency theory focuses on the separation of management and control, La Porta et al. (1999) pointed out that minority shareholders are often victims of policies that benefit controlling shareholders and the managers they appoint. SOEs listed on the stock market will mostly hurt minority private investors, especially in countries with poorly developed regulatory institutions and corporate laws that are not strong enough to protect investors (Boubakri et al., 2018). Ultimately, the state as a shareholder is only a representative of the general public; therefore, when appointed politicians favor themselves, the public, who are the true controlling shareholders, are harmed. Board members appointed by politicians are often selected based on political criteria, and not for their managerial skills. This interference can be harmful to firm performance. Shleifer and Vishny (1994) cite as examples of such negative interference the

number of employees and consequent labor cost increases, investments that ramp up to coincide with electoral cycles, and even accounting distortions.

The extent of legal protection for outside investors differs enormously across countries (La Porta et al., 1999). Legal protection consists of both the content of the laws and their enforcement. In common law countries, such as the U.S. and the U.K., minority shareholders are effectively protected, and outright expropriation of corporate assets by managers are rare. However, agency problems can still manifest through non-value-maximizing investment choices, and interference in a company's administration by politicians, who are appointed based on political criteria rather than management skills. This can be harmful to firm performance. In fact, La Porta et al. (1999) suggested that a country's legal and regulatory framework plays a significant role in capital market development, governance, and the conduct of the state. The weak incentives of government employees to implement both cost reductions and quality innovations are a core reason for the superiority of private ownership, confirmed by a variety of empirical studies.

A state has other means through which it can extract private benefits of control. In addition to expropriating economic value to maximize personal wealth, politicians and bureaucrats who manage SOEs can use their control over those firms to pursue political objectives. The use of a company's money to pay for perquisites is the most common example of such private benefits. For an SOE, those benefits can translate into over-employment, excess employee benefits, and investments with low returns based on voters' influence. The common feature is that certain benefits, regardless of their sources, are not shared among all of the shareholders in proportion to their shareholdings, but are only enjoyed by the party in control (Dyck and Zingales, 2004). Referring to the state's activities in exploiting these advantages of control, Shleifer and Vishny (1998) described the "grabbing hands" of the state and noted how the state could divert SOE resources in attempts to achieve political or social means.

The perception that SOEs are inefficient is grounded in the literature as the cost of government ownership because firms are politically connected and therefore pursue political objectives that differ from profit maximization, and managers of SOEs are typically entrenched bureaucrats. The result is that government control is associated with agency problems, resulting in weak corporate governance and poor performance. State companies are inefficient not only because their managers have weak incentives to control costs but also because inefficiency is the result of a government's deliberate policy to transfer resources to supporters (Shleifer and Vishny, 1994, 1998).

State ownership is higher in countries with low levels of per capita income, retrograde financial system, inefficient government, and weak protection of property rights (La Porta, 2000). Corporate governance has better controls and therefore improves efficiency. The improvement of corporate governance involves changing a nation's corporate and securities laws, strengthening the listing and disclosure requirements of its stock exchanges, enhancing the independence and effectiveness of the national judiciary, and establishing a regulatory control capable of balancing the competing demands of managers, in addition to shareholders and creditors. The combination of weak regulatory institutions and the absence of effective governance mechanisms results in frequent principal-principal conflicts between controlling and minority shareholders. A low level of institutional development in emerging markets can be an obstacle to the creation of controls (Young, 2008). Ramamurti (1999) also points to the failures of agency and property rights as SOE property rights are poorly outlined in socialist economies, often leading to the agency problem of "an agent without a principal" in which society as the principal cannot hold an SOE manager accountable. The result is the misuse of government assets.

2.3 Economic Theory of Privatization

Following the success of the first privatization programs and the initial evidence of performance improvements, Boycko et al. (1996) developed a model that explains the relative inefficiency of public firms and the rationale for improvement after privatizations. The authors argued that public enterprises are inefficient because they address objectives, such as social welfare, instead of profit maximization. The condition where a political benefit per extra dollar of spending on labor exceeds the political costs of profit foregone by a government can be explained as:

$$m(1 - \alpha) < q$$

where α is the fraction of the firm owned by private shareholders. In a public firm, α is close to zero, while 1 - α indicates government participation, *m* is the cost incurred of a dollar of profits foregone by a government because of spending on excess labor due to the hiring of a politician instead of a business manager, and q is the excess employment.

Privatization causes two changes: First, the control of a company's turnover and expenses is moved from politicians to managers. Second, the cash flow is no longer owned or

managed by the government. The model presented by the authors illustrate how privatization drives a wedge between politicians and managers:

$$k\alpha + m(1 - \alpha) > q$$

where k is the measure of the political cost of subsidies, and m < k since it is easier for politicians to spend profits on excess employment than to obtain government subsidies. Privatization leads to restructuring because politicians can no longer successfully use subsidies to convince managers to employ excess labor.

Boycko et al. (1996) expressed efficiency in terms of labor use. The model is designed based on politicians' preferences for spending on excess labor for political benefits, such as voting support. This is possible because in a politician's objective function there is a tradeoff between the political benefits of excess employment and the disadvantages of lower profits for shareholders, in this case, the government. When privatization happens, and the politician is removed from the decision-making process, the equation will favor profit seeking instead of overspending, due to privately employed managers' objective functions.

Excess labor is a key issue in the inefficiency of SOEs. Politicians interested in pleasing voters are keen on over-hiring and highly reluctant to lay off workers. Politicians cause SOEs to employ excess labor and firms are pressured to hire politically connected people rather than those best qualified to perform managerial tasks. Boycko et al. (1996) defined political control as politicians offering higher labor spending to procure political benefits. Privatization effectively drives a wedge between politicians and managers and depoliticizes firms, leading to their restructuring which changes the model. The critical agency problem, which explains the inefficiency of SOEs, is a problem caused by politicians rather than managers. Managerial discretionary problems are minor relative to political problems: "Privatization works because it controls political discretion" (Boycko, 1996).

Theory	Description	Relevance
Theory of public goods (Samuelson, 1954)	Public goods are considered non-excludable and non-rivalrous, collective goods that are available for all consumers. The origins of SOEs can be traced to the need of the state to provide goods or services for the public, considering inefficiencies as monopolies and externalities that the private sector could not overcome	Justification for the creation of SOEs *Why SOEs exist*
Agency Theory (Jensen and Meckling, 1976)	Principal-agent and principal-principal conflicts Interference in a company's administration by politicians	Reasoning for SOEs' inefficiencies *Why SOEs are inefficient*
Theory of Privatization (Boycko, 1996)	SOEs are inefficient because they address objectives other than profit maximization.	Political use as the main source of inefficiency can be eliminated with privatization *How privatization corrects the inefficiencies*

Source: Elaborated by the author.

3. REVIEW OF EMPIRICAL LITERATURE

3.1 Worldwide Evidence of the Effects of Privatizations

The previously mentioned theoretical arguments are generally based on the assumption that state- and privately-owned organizations differ in their objectives, financing, resourcing, and management practices. These differences have been documented in extensive empirical studies. As privatizations became more common in the late 1980s and 1990s, the benefits to reducing the roles of governments as producers became apparent and began to be examined in the literature. The first studies were published following the first wave of privatized companies, which started in Europe and quickly spread to Asia and Latin America. Empirical research on privatized companies and SOEs in the 1990s and the beginning of the 2000s found a negative association between government ownership and firm performance (Boardman and Vining, 1989; Megginson and Nash, 1994; Boubakri and Cosset, 1998; Schleifer, 1998; Dewenter and

Malatesta, 2001; Megginson, 2001; Boubakri et al., 2005; D'Souza et al., 2005; Gupta, 2005). This finding was consistent in developing countries as well as in emerging markets and was more pronounced in countries with weaker regulatory institutions. The weak incentives of government employees to introduce both cost reductions and quality innovations are core reasons for the superiority of private ownership (Megginson, 1994).

In the 1990s, evidence of the failures of SOEs began to accumulate, and a wave of privatization spread across the globe (Megginson, 2001). When opportunities for government contracts are misused, the benefits of outright state ownership become intangible, even when social goals are considered. Moreover, it becomes clear that private ownership is the crucial source of incentives to innovate and become efficient, accounting for what Samuelson (1954) called "the tremendous vitality of the free enterprise system".

Megginson and Nash (1994) produced detailed empirical evidence on how the benefits of privatization improved the performance of companies in the first wave of privatizations. The authors examined firm-level effects of privatization using a sample of 149 companies from various countries. In their findings, there were significant increases in profitability, output per employee capital spending, and even total employment after companies were privatized.

Shleifer and Vishny (1994) also modeled the bargaining relationships between managers and politicians addressing the issue of corruption and inefficiency. They found that privatization could work when accompanied by restrictions in politicians' abilities to provide subsidies, thereby reducing the benefits of voters' support. They argue that true reform can only come from social forces that are concerned with business. As the quality of the regulatory institutional environment is an important factor in firm value (La Porta et al., 1999), country-level corporate governance also has an impact on the changing benefits and costs of government ownership. Weak institutions and lack of investor protection make it easier for governments to exploit the firms that they control.

Broadbent (1992) concluded that privatizations can correct inefficiencies in public management. Although nationalization has been perceived by some authors as necessary to promote growth, especially after WWII, it lost ground during the 1990s. Transferring the control of SOEs to private capital was proved to enhance efficiency by introducing competition, obtaining resources in financial markets, reducing public debts, decreasing trade union influences, transferring decision-making processes in the markets of goods and services from

the public to the private sector, encouraging capitalism growth, empowering employees by selling them company shares, and redistributing social wealth.

Dewenter and Malatesta (1997) studied the returns of investors who bought shares in share issue privatizations, in which governments sell companies by listing then on stock markets. The authors concluded that most offerings were underpriced, and that investors obtained abnormal returns after the acquisitions. However, the reasons were assumed to be consistent with the theory of information asymmetry in markets during the early stages of development. The results, however, did not support the hypothesis that the government purposely underpriced the shares to attract investors to support privatization programs. A turnaround with changes in management and efficiency gains were later found in other comparative studies (Megginson, 2001) and could have caused these changes in valuations.

Boubakri and Cosset (1998) also examined the change in the financial and operating performance of privatized companies in developing countries that experienced full or partial privatization from 1980 to 1992. Using accounting measures, the results showed relevant increases in profitability, operating efficiency, capital investment spending, employment levels, and dividends. Nevertheless, trade unions worldwide are typically the strongest opponents of privatization, precisely because they obtain substantial benefits for their members in exchange for political support (Lopez-de-Silanes, 1997; Shleifer, and Vishny, 1999). The case for government ownership is weakest when the transfer of wealth to constituents, using government-owned assets in exchange for political support, is common. At the same time, the prevalence of support also explains why government provisions are much more widespread than what is socially desirable. Moreover, many of the issues concerning private firms fail to address social goals and can be addressed through government contracts and regulations without resorting to corporate ownership (Boubakri and Cosset, 1998).

D'Souza and Megginson (1999) analyzed share issue privatization during the 1990s and concluded that operating performance improved significantly in all industries in several countries. The authors observed that the 1990s saw an important shift, both in the industries being privatized and in the number of countries participating, including traditionally regulated sectors, such as banking, telecommunications, and electric utilities. The study showed significant increases in output and profitability, as well as a decrease in leverage combined with higher capital expenditure, implying greater gains in efficiency. Schleifer (1998) concluded that private ownership should generally be preferred to public ownership when the incentives to innovate and to contain costs are stronger.

Megginson (2005) followed up his first analysis of privatization results with a larger sample, and the same results were obtained. Boubakri et al. (2005) studied privatized companies in developing countries and concluded that even across borders, privatized companies became more efficient. Megginson (2005) proceeded to use both results to investigate the reasons that privatized companies' performance improved. Although the results of improvement were similar in emerging and developed countries, the reasons appeared to be different. In developing countries, institutional factors are more frequently significant determinants of post-privatization performance improvements; for example, trade openness significantly affects revenue and profitability of newly privatized companies. In addition, stock market liberalizations assist efficiency improvements. Privatization exposes managers to the pressures of financial markets and to the monitoring and discipline of profit-oriented investors.

Other additional factors in changing ownership, such as competition, can also expose a firm to the discipline of the market and the pursuit of greater efficiency. A firm privatized during a period of overall economic growth (perhaps brought about by greater trade liberalizations, advantageous capital market conditions, or a combination of factors other than privatization) can experience improved performance in post-privatization years. The most influential factor in performance improvement is a change in ownership (Boubakri et al., 2005; Megginson, 2005; Borisova et al., 2012) because SOEs can pursue objectives other than profit maximization, and new owners provide different managerial orientations, in addition to better expertise and greater access to new markets.

Even a partial privatization has proved to be beneficial in terms of performance gains (Gupta, 2005). Partial privatizations occur when a government sells only a minority participation right and remains a controlling shareholder. Raising capital by selling a minority share in the SOE is common in both Brazil and worldwide. Gupta (2005) collected data on companies with non-controlling shares held by the government in India between 1990 and 2000 and concluded that even partial privatizations can significantly impact the operating performance of firms. One explanation is the change in human capital, when a new CEO is appointed and is pressured by private investors, whose valuations of public companies are based on their knowledge of the markets, rather than political influence. By eliminating political interference, which forced managers to employ surplus labor and pursue other inefficient policies, and by reducing agency problems that impede management efficiency, partially privatized firms that were later sold continued to improve, even in terms of labor productivity

and profitability. Therefore, as long as politicians are in control, public-sector firms will be characterized by political interference.

Dewenter and Malatesta (2001) analyzed the differences in performances between SOEs and privately owned firms in a comprehensively researched study. The authors analyzed measures for profitability, leverage and employee efficiency, and the results showed that SOEs consistently underperformed when compared to privately owned companies over 20 years, across different countries, sectors, and economic cycles. The cross-sectional comparisons also showed that government firms tended to use more leverage and display greater labor intensity than private firms: "The difference was not only statistically significant, but large. The implication is that in competitive markets without significant externalities private ownership is the superior organizational form" (Dewenter and Malatesta, 2001, p. 332).

Megginson and Netter (2001) published the first survey on privatization – perhaps the most cited article in the field of privatization to date. They researched the first two decades of privatization and estimated that in this first wave, approximately US$ 1 trillion was raised by governments through the sale of companies, with the peak years of 1997 to 1999 reaching a value of US$ 150 billion. From the perspective of an advisor on government policy who is wrestling with the practical problems of whether and how to implement a privatization program, Megginson and Netter (2001) concluded that privatization works, because divested firms almost always become more efficient, more profitable, financially healthier, and that they increase their capital investment spending, ultimately contributing further to economic growth. The main driver was that state ownership had other non-declared objectives compared to private capital's single purpose of maximizing profits. In general, the state wants to maintain employment, increase tax collection, improve social welfare, control prices, and maintain the stability of the financial system, which are all goals that are incompatible with profit maximization in the case of a business (Megginson and Netter, 2001).

In a quantitative survey on transition economies in Europe, Djankov and Murrel (2002), explored several studies that compared the performance of companies when ownership structures changed in Eastern Europe in the 1990s. Transition economies were those in Central and Eastern Europe and in the Commonwealth of Independent States (CIS) that replaced the Soviet Union, following major economic system changes. The authors surveyed the early literature, which focused on how the different types of owners impacted companies' performance and concluded that privatization to outside owners resulted, on average, in 50% more restructuring and the effects were typically positive and statistically significant. The

studies were classified into three groups, based on the quality of their analyses and methodologies and the results were similar even when using detailed methodical research. Privatization is strongly associated with more enterprise restructuring and "economic effects are quite often very large, for example adding several percentage points to enterprise growth rates" (Djankov and Murrell, 2002, p. 740).

Estrin et al. (2009) also surveyed the literature that evaluated the effects of privatization in transition economies. In Central and Eastern Europe, the effects of privatization were mostly positive but quantitatively smaller than those with foreign owners and increased in the later periods of the transitions. In the CIS, privatization to foreign owners yielded either a positive or insignificant effect, while privatization to domestic owners generated either a negative or insignificant effect. The articles on China found diverse results, with the effect of private ownership on total factor productivity being mostly positive. Most notably, the authors concluded from a macro perspective that the results suggested that "privatization, especially when accompanied by complementary reforms, may have a positive effect on the level of aggregate output or economic growth" (Estrin et al., 2009, p. 702).

Megginson and Nash (2004) studied the impact of political, institutional, and economic factors that affect the choice of privatizing through a direct sale to private capital or through a share issue in the public capital markets and concluded that the choice is influenced by where governments can raise the most money. Nevertheless, selling through capital markets has proved to be an important tool in developing equity markets, and it strengthens public capital markets. Public market sales are also more likely when there are stronger legal institutions and greater protection of shareholder rights and minority interests. As such, when a country develops its capital markets, privatizations through public offerings can become more common and, at the same time, indicate that the government can sell at higher prices. Additionally, larger SOEs are more likely to be sold in public capital markets because more expensive sales require deeper investor pockets.

Bortolotti et al. (2004) showed that share issue privatizations had major impacts on the growth and liquidity of non-U.S. stock markets and on the participation of individual and institutional investors therein, particularly through the shares offered to foreigners in initial public offerings of privatized firms, because these foreign direct investment flows lead to economic growth and institutional development. Moreover, the authors conjectured that privatization positively influences globalization since the process of fostering private sector participation often involves the allocation of substantial shares to foreign investors in newly

privatized firms. Foreign investments boost technology and the managerial skills that accompany globalization and therefore the economic environment is more competitive, thus fostering GDP growth. The results suggest that privatization can be instrumental in attracting foreign capital, which can contribute to domestic economic growth.

Dinç and Gupta (2011) studied political and financial factors in the selection of firms for privatization. Despite privatization of state-owned companies having documented benefits, they found that there are still widespread delays in the process, with the government choosing to sell some firms, but not others. They collected data on more than 260 SOEs in India between 1990 and 2004 and compared firms that were privatized to those that remained state-owned. The conclusion was that the decision to privatize was affected by firm-level characteristics and location-specific electoral considerations. While the benefits of privatization are widespread, increases in revenue from sales, development of financial markets, efficiency gains, and productivity gains and the losses for politicians are concentrated among a small group, such as employees and unions, resulting in a loss of voters, and these costs often impede the privatization process. Differences between government controls and regulations in developing and developed countries can explain why privatization has different outcomes in these two types of countries. However, competition could be a key factor in improvement; thus, liberalization, in addition to privatization, forces public companies to be more efficient.

Privatization has always attracted foreign investors from multinational corporations, foreign direct investments, or even institutional foreign portfolio investments. Therefore, Boubakri et al. (2013) studied the relationship of privatization with direct and portfolio foreign investments in developing countries, with a focus on BRICS countries (Brazil, Russia, India, People's Republic of China, and South Africa) from 1984 to 2006. They found that globalization, measured through foreign direct investment, had a positive impact on privatization by providing strong evidence of a bidirectional positive relationship between privatization proceeds and foreign investments.

Private benefits of control in SOEs directly translate into corruption, since the use of a public position to derive private gains will negatively impact the institutional environment (D'Souza and Nash, 2017). Corruption in SEOs facilitates the diversion of resources and the obtaining of private benefits. D'Souza and Nash (2017) expanded the research on the private benefits of control, for companies controlled by governments, by extensively studying how corporate governance was applied in SOEs, in which the government was the majority owner, to examine if the problem was a lack of corporate governance, similar to the agency problems

in the private sector. However, a major issue with SOEs is how politicians use their resources to achieve political, social, and personal goals. The authors concluded, as did La Porta (1999), that regulatory institutions clearly matter, since there is an inverse relationship between institutional quality and the private benefits of state control. For example, cross-listings are more likely when there are fewer private benefits of control, so when a government privatizes firms using a cross-listing, it foregoes private benefits and exposes itself to more controls from foreign markets.

Control benefits are difficult to document and measure, which is why many SOEs maintain their status. In countries where private benefits are large, control is more concentrated, and privatizations are less likely to occur. Dyck and Zingales (2004) concluded that corporate control is on average worth 14% of the equity value and is the premium paid for being in command and a source of private benefits for top executives. These premiums are higher when there is less protection for investors. Advanced financial development protects minority shareholders by reducing such private benefits. Developed security markets, legal regulations, and even tax enforcements, help to prevent these benefits; for example, if minority shareholders can take legal action against management, it limits management's ability to engage in misconduct. In addition to the law, controlling and regulatory bodies, competition, labor pressures, moral norms, and public opinion can also help to reduce the appropriation of such benefits (Dyck and Zingales, 2004).

The aggregate efficiency benefits of privatizations were demonstrated by Boardman et al. (2016). According to their research, long-term privatization results in higher productivity that continues to improve over time with a peak after approximately 14 years. This has important implications for public policies. SOEs that operate in reasonably competitive markets should be completely privatized. The benefits go beyond higher returns for shareholders by including advantages such as efficiency gains that can be passed on to consumers and employees. These are the social values of privatization. Changing politically appointed managers and implementing new strategies, including changes in corporate cultures, take many years to fully develop: "Thus, the benefits of privatization are a long-run process rather than a short run event" (Boardman et al., 2016, p. 1013).

In a meta-analysis of 60 empirical studies that compared the performance of privatized companies, Bachiller (2017) investigated how a change in ownership affected the performance of privatized companies. The findings indicated that companies privatized by public offerings performed better than companies privatized using other methods, such as a private sale or

voucher privatization. This did not support the general assumption that privatization in developing countries did not improve financial performance. When privatization is achieved by issuing shares, in a developing country, profitability and efficiency is much higher.

Cosset et al. (2016) concluded that privatization progression (i.e., the sustainability of a privatization program) is associated with lower systematic and idiosyncratic volatility in a stock market. Privatization reforms sustained over time increase investor confidence and reduce political risk, hence lower market volatility. The privatization-volatility relationship varies with the level of economic development. Lower market volatility is associated with smaller impacts on political risk, as well as consequential increases in the levels of economic development. It is more pronounced in developing countries. Privatization through share offerings in the stock market greatly reduces systematic and idiosyncratic volatility, while privatization through asset sales to the private sector only slightly reduces systematic volatility. By reducing political uncertainty and volatility, a privatization program can increase the investment level in a country over time. The stock market can also benefit from an increase in stock liquidity (Boubakri et al., 2019).

A critical issue, which is less often discussed, is the positive correlation between privatization and corporate social responsibility (CSR). Lins et al. (2017) showed that firm-specific social capital, through higher CSR initiatives, can improve the financial performance of firms, especially in times of crisis. In other words, CSR activities are more important when trust in corporations is weaker. Boubakri et al. (2019) examined privatized companies in different countries that posted higher CSR scores than other publicly-traded companies. In contrast to the common political view that the state is the guardian of social welfare and privatization could undermine socio-economic development, privatized companies increased CSR in an effort to enhance their reputations and to align their objectives with the government, ultimately leading to increased valuations by investors and lower costs of capital.

3.2 The New Wave of State Capitalism

Despite the evidence that privatization improves companies' performance and efficiency, a new wave of state capitalism has emerged over the past 15 years, led by the Chinese government as a result of China's substantial growth in the 2000s. It also emerged in Europe, which implemented bailout programs after the financial crisis in 2008. Not only SOEs, but development banks, public pension funds, but also sovereign wealth funds, are now at the

center stage in the global economy. The economic rise of China dominated by SOEs, the rise in global oil prices fueled by national oil companies owned by non-democratic governments, and the re-emergence of autocratic states (Russia, Iran, Venezuela) led the world towards a new wave of state capitalism, in which governments sometimes own but always promote the interests of national champions in key industries, and restrict foreign investment and competition. Governments have acquired more assets than those sold between 2003 and 2013, which according to Borisova (2015), amounts to US$ 1.52 trillion compared to US$ 1.48 trillion.

The new supporters of state capitalism in the 2000s argued that the state can provide stability as well as growth, despite these not being new ideas. Most of the newly risen national champions were outward looking, acquiring contracts all over the world and even listing on foreign exchanges. Governments were not randomly selecting their corporate holdings (The Economist, 2012). The costs continued to rise, as large state companies could be momentarily efficient in copying ideas, although they would soon lose their competitiveness to new rising networks of small start-ups. The defenders of state capitalism continue to hide the most relevant reason for its comeback: the political advantage of control. Even in democratic regimes, such as Brazil, politicians can simply tell large companies what to do. For example, Petrobras underwent a massive capital expenditure program from 2009 to 2015, including rules that obliged the company to include more than two-thirds of national content in their acquisitions.

The trend toward state capitalism, nationalizations, and government bailout programs after 2008 has also revived the debate about government ownership and the extent to which this level of involvement in the economy is beneficial. Notwithstanding the competing views on this yet current debate, empirical evidence continues to show that free markets should prevail, and government ownership should be reduced to a minimum (Megginson, 2017).

State capitalism in the twenty-first century has taken the combination form of majority ownership of SOEs with a hybrid one of ownership that includes minority equity investments, and also other forms of support for private firms. Musacchio and Lazzarini (2012) stated that governments, particularly in emerging markets, have justified the rise of hybrid forms of capitalism to solve market failures. For private companies, in contrast, the rise of new SOEs – firms with minority government ownership and private companies backed by loans from development banks – can be seen as threats because governments can use its interference to influence markets, for example, by dictating their pricing strategies, or by providing them with

privileged access to resources, such as low-cost favorable loans, unavailable to private enterprises.

Lazzarini and Musacchio (2018) then investigated why, with so much evidence documenting the inferior performance of SOEs, there is still large presence of SOEs and resistance to privatization. According to their research, in 2013, among the top 100 firms ranked in the Fortune 500, 25 were SOEs. Considering the resilience of SOEs, Lazzarini and Musacchio (2018) studied whether their performance changed and the factors causing that. The authors analyzed a global sample of 477 large companies in 66 countries between 1997 and 2012. They also introduced a comparable sample, with matching techniques that selected privately-controlled companies and concluded that the key question in state capitalism is not whether SOEs underperform private companies but when and where. They found that SOEs underperform their private peers during economic downturns because they tend to be less efficient in cutting costs and adjusting to shocks. They also noted that SOEs that are controlled by the state underperform, while companies in which the state is only a minority shareholder do not present significant differences in performance, since they tend to be less influenced by the government. Finally, they concluded that a government's negative influence on SOEs is higher in countries with weaker local institutions formed to constrain political interference, which is a similar conclusion to those of Gupta (2005) and Boubakri (2005).

The slow process of full privatization was the subject of Boubakri's (2011) research. When governments sold SOEs gradually, it took, on average, seven years before the SOE was completely privatized. Full privatization is a slower process in socialist societies and when political constraints and employment protection laws are more inflexible. The positive effects of full privatization on firm outcomes, mainly risk-taking investments, labor efficiency, profitability, and growth, support previous theoretical and empirical arguments that full renunciation of control by the government is required to change firms' objectives. Governments influence markets through various rules, such as taxes, laws, and regulating competition. Unexpected changes in those rules can elicit strong market reactions. Thus, perceived political influence can result in decreased stock prices and market volatility. (Cosset et al., 2016)

Nasr and Cosset (2015) extended the studies on privatization by analyzing the impact of government ownership worldwide on stock price informativeness. The political characteristics of governments affect the relationships between state ownership and stock price informativeness. Less transparent environments cause costly private information acquisitions, discourages informed trading, and prevent the incorporation of firm-specific information into

stock prices. They found strong and robust evidence that state ownership is associated with lower stock price informativeness especially in countries with fewer political rights. This is consistent with the conjecture that state ownership is associated with less transparency and discourages investors from trading according to private information by reducing the incorporation of private, firm-specific information into stock prices.

Megginson and Boubakri (2017) analyzed listed SOEs to determine whether governments influence the valuations of publicly-traded firms. Specifically, they investigated whether the relationship between government ownership and corporate valuations was influenced by the quality of the existing institutions and governments. Market valuation is relevant because it represents investor expectations of future cash flows, which is different from accounting standards for efficiency. The result was that government controlling rights in excess of 50% translated into lower valuations.

In a qualitative study of Brazilian electric power companies with mixed ownership, Loch et al. (2019) found that while a government stake in a firm's ownership can provide a channel for a government to seek support and resources, it also creates distortions and uncertainties and aggravates agency conflicts, impairing minority shareholders. The authors acknowledged the evolution of corporate governance in Brazil; however, minority shareholders are still largely ignored in decision-making processes.

The possibility that improvements in corporate governance could result in enhanced performance in SOEs has also been studied (Lattanzio and Megginson, 2021; Ruggiero et al., 2021). In a study based on earnings management, Ruggiero et al. (2021) show that SOEs' publicness is either irrelevant or detrimental to the quality of SOEs' financial accountability, depending on the dimension of publicness considered. SOEs are privately run entities subject to public control. To safeguard the public's interest in their activities, efforts should be made to define policies and governance arrangements that are able to influence managers' behavior to preserve SOEs' financial accountability. The authors conclude that the role of political authority and how its influence can be exerted to improve financial accountability in SOEs is still an open debate.

It has been observed that some improvements in privatized companies occurred before privatization, during the process of preparing the companies to be sold. Hence, the question of whether improvements in corporate governance in SOEs could replace the change in control was also researched in the privatization field. Lattanzio and Megginson (2021) collected a

sample of withdrawn privatizations – companies that were reformed to be privatized but were not privatized for various reasons. After privatizations are relinquished, agency costs reappear with reductions in operating efficiency and payout ratios, resulting in a suboptimal level of employment and overinvestment. “As the expectation of being exposed to market discipline disappears state ownership induced agency costs reemerge, absorbing back the efficiency gains achieved by target SOEs over the pre-treatment period. Therefore, while the successful transfer of ownership and control to private investors is not sufficient for the long-term efficiency gains, it is a necessary condition for the long-term success of privatization programs” (Lattanzio and Megginson, 2021, p. 10). They concluded that, in the absence of a permanent ownership change, most gains realized during the restructuring process are re-absorbed in the post treatment period. Agency conflicts reappear with reductions in operating efficiencies and payout ratios, resulting in suboptimal levels of employment and overinvestment. The study also suggested that these inefficiencies are ultimately transferred to consumers or taxpayers, either directly or through subsidizations.

Restructuring SOEs prior to privatization has also been studied by Santos (2016). To overcome the skepticism of private investors or to increase market values, governments usually proceed with financial and operational restructuring of SOEs, which may include CEO change, replacing mostly politically appointed managers, labor reductions, and debt restructuring. The author concluded that these restructuring measures did not necessarily result in higher selling prices in SIP (Share Issuance Privatization). Instead, the prices were more dependent on the final ownership structure, with a more concentrated private ownership leading to higher SIP.

Goya et al. (2020) studied the dividend distribution of privatized firms and concluded that privatized companies are not only more profitable than SOEs, but also pay a significantly higher share of profits to shareholders. Firms increased dividend payouts after privatization, and payments and payouts are considerably higher compared to SOEs. The authors suggest that a higher dividend payout is the result of a change in ownership to a larger number of shareholders with a reduced incentive to monitor management, and the resulting agency conflicts. The observed increase in dividends immediately following privatization was mainly driven by improvements in firm efficiency, profitability, growth opportunities, and new incentives for privatized firm managers to reduce agency costs.

Despite the new wave of state capitalism, Megginson’s (2017) second round of extensive research on privatization literature for the period 2004–2017 continued to prove that SOEs are still less efficient than privatized or private corporations across industries, countries,

and economic cycles. The results emphasized that different types of state owners have very different impacts on corporate values and performance, and state ownership generally has a significant, and mostly pernicious, impact on corporate investments and financial policies.

The recent privatizations still impacted global capital markets and truly altered the development path of important national economies, particularly in China. In fact, almost 20% of recent empirical studies on Asia – and particularly on China – analyzed the performance of companies after privatization. The research documented significant performance improvements after companies were divested through share issue privatizations, after control was transferred from state to private owners through asset sales or private share trades, after government ownership was reduced through equitization (Vietnam), or by primary share offerings in which the government did not participate (China). The World Bank report states: "A carefully structured and well-articulated program for privatizing major SOEs, combined with efforts to establish a suitable regulatory and legislative framework, can give a stock market the needed boost in size and quality" (Liberman and Fergusson, 1998).

After reviewing almost 100 recent studies on privatization, Megginson wrote (2017, p. 50):

> *Finally, the research surveyed here convinces me that "state capitalism" is an essentially failed model, at least for all but the most under-developed economies. The economic rise of China and the high oil-price regime of 2005-2014 made this seem a plausible model for development, but the abysmal relative performance of state-controlled versus private owned firms in key industries—especially petroleum, banking, and technology—clearly shows the model's inherent weakness. State ownership of business will certainly remain an important economic fact, due to the size of the economies where state ownership is most prevalent and the currently dominant ownership position of national oil companies over petroleum reserves, but state capitalism is not the future. In addition, unless the price of oil unexpectedly returns to the $100 level, we will soon witness a series of oil company privatizations of unprecedented scale.*

3.3 The Benefits of SOEs

Divergent results in previous studies on privatization can usually be attributed to whether the privatization was in full or partial, the institutional environment, and the regulatory and investor protections in the country (Radic et al., 2021). The benefits of SOEs are concentrated in cases where the government is a minority shareholder and where regulatory institutions are well developed and offer stronger protection to investors.

The global financial crisis of 2008 was one of the catalysts of the new wave of state capitalism. Governments in many market-oriented countries helped to capitalize companies and financial institutions, becoming state shareholders and sometimes even controllers. Under certain circumstances, state ownership was also associated with better monitoring and governance (Borisova et al., 2012) and, most importantly, protection in times of financial distress (Faccio et al., 2006; Borisova et al., 2015). Most common advantage of SOEs were related to soft budget constraints and implicit bailout guarantees in times of distress (Kornai et al., 2003; Faccio et al., 2006; Beuselinck, 2017). Soft budget constraints allowed easier access to low-cost financial resources that provided SOEs with comparative advantages, which led to higher valuations (Boubakri et al., 2018).

According to Beuselinck et al. (2017), government ownership can benefit firms. This study focused on the relationship between government ownership and the value of European firms during the 2008 crisis and found that SOEs were less volatile during the crisis because state control was perceived as a positive indicator in weathering the storm. However, this assumption was true only in countries with strong investor protections and high-level governance institutions, rather than in developing countries with higher rates of corruption. The study concluded that governments could help stabilize firms' costs of debt with implicit and explicit government guarantees to alleviate financial supply shocks.

Government benefits were also found in SOEs in which the state maintained minority participation. Boubakri (2018) analyzed the minority participation of states in listed companies in European and Asian valuations, and stock returns fared better during crises, especially in countries with strong regulatory institutions. Lazzarini and Musacchio (2018) pointed out that the state can provide such companies with protection since differences between SOEs and private firms are not static but vary depending on contingencies affecting the likelihood of government intervention. According to Beuselinck (2017) and Boubakri et al. (2018), most of the benefits observed in companies were found in situations where the state was a minority shareholder and did not control the relevant decisions, and in countries with strong institutions that protect investors.

Borisova et al. (2015) studied the influence of government ownership on the cost of debt and whether the influence of government, through implicit guarantees, impacts this cost. They analyzed annual credit spreads for publicly traded bonds between 1991 and 2010 for firms with and without government ownership in 43 countries and found that state ownership was associated with a higher cost of debt during the pre-crisis period of 1990 to 2007. However,

from 2008 on, as the cost of debt increased sharply, state ownership became associated with a significantly lower cost of corporate debt. SOEs were perceived as lower-risk investments that relied on government protection, amid a scenario of several bailout programs. It is less likely that a firm with state ownership will be allowed to fail. During times of firm-specific or economic distress, the dominant effect of government ownership is a reduction in the cost of debt.

Credit rating agencies take into account the fact that a company is an SOE in their risk assessments. The consideration varies depending on the strategic importance and influence of the firm. This can result in several credit rating increases, which indicate that the ultimate risk is borne by the government that owns the SOE. The government has the ability and willingness to service the debt because it does not want to be associated with failure and default would impact the cost of government debt.

Government ownership can carry an implicit guarantee of repayment, thus reducing the chance of default and leading to a lower cost of debt. During a financial crisis, the importance of this guarantee is increased. However, the cost of debt can also be increased if an SOE is perceived as a moral hazard, if there is inefficient monitoring, or by imposing social and political goals that reduce corporate profitability and repayment capabilities. To a certain extent, government regulation and managerial incentives also apply to companies that remain SOEs. Bartel and Harrison (2005) argued that public-sector inefficiency is due to the soft budget constraints and the level of internal and external competition, which implies that efficiency gains in SOEs could be achieved by reducing or eliminating government financing for public enterprises and by increasing import competition.

Estrin (2018) listed some concerns that might have limited the spread of privatization programs. First, the record of privatization as it spread to middle income and then transition economies (including China) was not always as positive as in developed economies. The performance of the applicable firms might not have been enhanced, if the method of privatization was inappropriate, or the market environment was uncompetitive (Estrin et al., 2009). Additionally, privatization programs were often associated with scandals where inappropriate valuations led to the emergence of excessive inequalities in wealth. Second, in developing economies where institutional environments, particularly with respect to the regulation of monopolies, were sometimes even weaker than in transition economies, the benefits of privatization were even less immediate, depending on the sector, and were significantly conditioned upon the design of privatization programs.

Finally, distributional issues were especially significant in developing economies, therefore, privatization programs also had to consider distributional impacts more than developed economies had to, and opposition emerged from issues raised by efficiency-equity trade-offs. Finally, political economic issues were more important in policy choices in developing economies, and privatization programs were especially open to manipulation by extractive political institutions and elite groups in fragmented political environments (Estrin, 2018).

In contrast, according to Megginson and Boubakri (2017), the government as a minority shareholder results in a higher valuation because there is no direct influence that can impact efficiency and cash flow but can still offer some security during crises. Again, this outcome was more pronounced in countries with better protection for investors and where governments were more effective and stable. Most of the positive impacts come from financing and the soft budget constraint view that lowers the cost of debt and discounts the rates investors use to value cash flows. These findings were also documented by Beuselinck et al. (2017) who found a positive relationship between SOE valuations and financial market developments because governments can favor companies that benefit from lower cost of capital. These valuation differences were found before and during the financial crisis of 2008 and 2009. The relationship between government ownership and firm value helps to shed light on the relative costs, such as agency problems and weak corporate governance, and benefits like soft budget constraints and monitoring of management by state investors of state ownership. Thus, when the government is a minority shareholder, there are benefits to this ownership, in an environment with stronger market regulatory institutions that protect investors.

3.4 Selection Bias and the Endogeneity of Ownership Structure

Prior studies have pointed out the potential selection bias and endogeneity in econometric models used when comparing SOEs and privatized companies, since governments do not select companies to privatize at random (Dewenter and Malatesta, 2001; Chong and Lopez-De-Silanes, 2004; Megginson et al., 2004; Lazzarini and Musacchio, 2018). As Megginson and Netter (2001) noted, governments may privatize the healthiest firms first to make privatization look good to attract potential private investors, especially foreign capital.

The decision to privatize may be a deliberate choice that is likely to be viewed favorably by investors (Goyal et al., 2020). Likewise, this constrains the set of firms and industries that

remain government owned. SOEs with better market prospects, for example, because of improved competitiveness, are more likely to generate stronger cash flows for the state when divested. This biased selection also makes techniques such as propensity score matching within a single country a challenge, because it would be difficult to generate a control sample that is similar to the remaining SOEs.

Demsetz (1983) also argues that the ownership structure should be thought of as an endogenous outcome of decisions that reflect the influence of shareholders. Therefore, empirical studies about this relationship seem to have yielded conflicting results. “Persistent diffuseness of a firm’s ownership structure plausibly serves the firm’s shareholders better than would a concentrated ownership structure, even if more diffuseness of ownership does allow professional management to divert more of the firm’s resources to serve its own narrow interests” (Demsetz and Villalonga, 2001 p. 215). In the present research, the issue of diffuse ownership is not at stake, but rather the difference of control between two distinct entities, government and private investors. Therefore, Demsetz and Villalonga’s argument that markets respond to forces that create suitable ownership structures for firms and remove the predictable relationship between ownership and performance may not apply to privatizations. Nonetheless, the authors conclude that single equation models on the effect of ownership structures on performance may lead to results that could be biased due to unobservable factors, and endogeneity should be taken into consideration. Privatization, albeit not a market force, is not a random event.

Djankov and Murrell (2002) surveyed several studies dealing with the effects of privatization on transition economies during the 1990s. Following Demsetz’s arguments on endogeneity, they rated papers on a scale of 1 to 3, reflecting the effort applied to the problems of selection bias and endogeneity. A score of 1 suggested that nothing was done to address these issues. A score of 2 was applied to a partial attempt in which the authors considered using fixed effects without strong justifications for it. A score of 3 indicated that a lot of work was done to address the problem, using both fixed effects and instrumental variables (IVs). Djankov and Murrell (2002) recognized that although selection bias and endogeneity have long been pointed out in literature, solutions are not always easy to obtain. The IV method is a powerful weapon that can help estimate an average causal effect for a population even if the instrument does not affect the entire population (Angrist and Pischke, 2008). Despite the differences in quality in the examined research, the conclusion was the same: empirical evidence demonstrated the positive effects of privatization on transition economies where the most

significant gains were obtained with outside privatizations in which control was transferred to foreign investors, investment funds, blockholders, or banks.

Estrin et al. (2009) followed Djankov and Murrel (2002) and surveyed the literature on privatization, classifying the studies into those that employed fixed effects or IVs to attack the selection bias and endogeneity found in privatization and those that ignored the problem, performing ordinary least squares (OLS) regressions. The bias arising from unobservable heterogeneity, due to the selection of firms for privatizations, can be removed by estimating the fixed effects model. According to Estrin et al. (2009), when unobservable ownership effects vary over time, the estimation using IVs will account for potential endogeneity. In their survey, the authors also found robust results when difference-in-differences (DiD) or a matching technique were used.

Despite potential endogeneity, consistency in results when more modern or sophisticated models are used to control for these issues show that even earlier or rudimental studies cannot be disregarded in terms of their contributions to literature.

Considering this background, this study contributes to the literature on privatization and government ownership of companies in two fields. First, it measures the relative performance of SOEs and privatizations over a period of 15 years, ending in the current environment of a renewed debate on privatization. This debate follows years with waves of privatization and the subsequent dominant view on state capitalism. Second, it investigates the important case of Brazil in an original way, with a unique data sample aimed at answering relevant questions regarding investment and economic public policy issues. The recent growth of state capitalism in Brazil coupled with the diverse results from global privatizations offer a unique opportunity to investigate this issue, since it is still undetermined whether Brazilian SOEs follow the general pattern found in literature and underperform private-controlled companies, or if it is advantageous for the government, as a shareholder and public policy maker, to control these corporations.

4. HYPOTHESES

Considering the theoretical and empirical research on privatization effects on firms presented in the last section, the following hypotheses were tested.

H1. There is a negative relationship between state ownership and firm performance.

This hypothesis is tested along with two ancillary hypotheses:

H1.a There is a negative relationship between state ownership and a firm's profitability.

H1.b There is a negative relationship between state ownership and a firm's labor efficiency.

This first set of hypotheses investigates the negative relationship between a firm's financial performance and state ownership. The tests were conducted using the profitability and labor efficiency of SOEs and their private peers, as done in previous research comprising global samples (Dewenter and Malatesta, 2001; Gupta, 2005; Boardman et al., 2016). Accounting ratios are used because they are reasonable proxies for economic rates of return (Boardman and Vining, 1989; Megginson et al., 1994; Dewenter and Malatesta, 2001).

H2. State ownership is negatively related to market value.

The second hypothesis evaluates the impact of government ownership on market performance. In addition to the historic performance represented by accounting measures such as profitability, market values can help shed light on how the relative costs of government ownership, such as weak corporate governance and improper investment decisions affect market performance. Market values reflect prospects for the firm's future cash flows and contain more information than accounting ratios (Beuselinck, 2017; Boubakri et al., 2018).

H3. State ownership is negatively related to ESG scores.

The third hypothesis explores how Brazilian SOEs score on ESG compared to privatized companies. Previous empirical evidence shows that higher CSR leads to abnormal rates of return (Dimson et al., 2015; Lins et al., 2017). Considering that privatized firms tend to increase their competitive positions, this may result in larger ESG investments. In contrast, SOEs tend to pursue social objectives, which may also translate into higher ESG scores. Given the common perception that the state is the guardian of social welfare, and that privatization could undermine socio-economic development, as suggested by Boubakri et al. (2019), the association of higher ESG scores in privatized firms and their extra efforts to increase value can be investigated.

H4. Changes in policies and regulations impact SOEs' financial and market-based performances.

The fourth hypothesis is related to changes in the environment that may result in variations on how companies react. Using a global sample, Lazzarini and Musacchio (2018) concluded that in a challenging economic environment, government intervention may negatively impact a company' results. With different results, Beuselinck et al. (2017) found that during a financial crisis, European companies with government ownership experienced smaller reductions in firm values. Both studies indicated differences in the results depending on companies' locations, hence the relevance of investigating these results using a Brazilian sample. The quality of the institutional environment is an important factor in firm value (La Porta, 1998). Vitoria et al. (2020) showed that a portfolio of SOEs underperformed privatized peers during 2014 to 2016. In addition, there were significant risk increases in the performance of SOEs. This hypothesis may provide empirical evidence to counter the argument that SOE performance can be improved by only improving corporate governance.

5. DATA AND METHODOLOGY

5.1 Data and Sample Selection

Brazil has not experienced a major privatization in recent years. Most notable SOEs privatized were sold by public share issuances during the 1990s. Currently, Brazil's most relevant SOEs are listed on the local stock market, B3, and include minority private investors as shareholders. Two major exceptions are *Caixa Economica* (a public bank) and *Correios* (the national mail service), both 100% owned by the federal government. Because this study largely focuses on market performance and its significance for minority investors, the sample only includes Brazilian companies that are publicly listed on the B3 exchange. Out of the 350 listed companies, a total of 50 firms are either state owned or were previously privatized. A privatized company is defined as a company or concession that was once state owned and then auctioned to private investors, with at least 51% of control being transferred to private shareholders. Most privatizations in Brazil occurred in the early 1990s under the National Privatization Program (PND), led by BNDES. Shares auctioned were acquired by large domestic investors (financial institutions, pension funds, and industrial firms) and foreign groups. To create a sample in which companies could be compared to each other, certain companies, such as financial entities,

were excluded, and producers of commodities, such as steel, iron ore, and oil and gas, because most of these companies were privatized and only Petrobras remained an SOE.

Table 1 – List of Companies

SOEs		Privatized Companies	
B3 Ticker	**Company Name**	**B3 Ticker**	**Company Name**
CEBR6	CEB	AESB3	AES Brasil
CASN4	Casan	ALUP11	Alupar
CEED4	CEED	CCRO3	CCR
CMIG4	Cemig	TRPL4	Cetep
CESP6	Cesp	COCE3	Coelce
CLSC4	Celesc	CGAS5	Comgás
CSMG3	Copasa	CPFE3	CPFL
CPLE6	Copel	ECOR3	Ecorodovias
ELET6	Eletrobrás	ENBR3	EDO
EMAE4	Emae	ELPL3	Eletropaulo
SBSO3	Sabesp	ENGI11	Energisa
SAPR4	Sanepar	ENEV3	Eneva
		EGIE3	Engie Brasil
		EQTL3	Equatorial
		LIGT3	Light
		NEOE3	Neoenergia
		OIBR3	Oi
		OMGE3	Omega Energia
		RAIL3	Rumo
		VIVT4	Telefônica Brasil
		TIMP3	Tim Participações
		TAEE11	Taesa

Source: Elaborated by the author.

The final sample comprises 34 listed non-financial companies in regulated sectors, under concessions regulated by the state, 22 of which were privatized and 12 have remained under government control. Regulated sectors include energy, water utilities, road and rail concessions, and telecom services. Only two companies were privatized during the analyzed period, CESP in 2019 and CEB in 2020 (EMAE and CEED were privatized in 2021). On the privatized list, a few companies were publicly listed during the period, after acquiring either new greenfield concessions (Alupar, Eneva, and Omega) or assets that were previously government owned (AES and Taesa) and were included in the sample for the year in which

they became listed or operational. Table 1 presents a list of all the companies included in the sample.

The final sample is a unique dataset that represents the performance of SOEs and privatized companies for a period of 15 years, ranging from 2006 to 2020, with over 11,000 data points. The increase in government spending after the global financial crisis in 2008, resulted in fiscal constraints that led Brazil into a severe recession between 2014 and 2016, with GDP dropping 10% during the economic downturn. This caused an abrupt change in the government, followed by new rules for SOEs. To further study the impacts of political influence on SOEs' performance prior to the crisis and the impacts on companies' results after the changes, the sample is divided into pre- and post-2016 to identify potential differences in companies' performances.

Annual accounting and market data were collected from Bloomberg and from the companies' annual reports, available at CVM, Brazil's securities regulator.

5.2 Identification strategy:

Considering the concern with the endogenous effect of privatization, this section presents a detailed description of this study's rationale to treat this issue.

By focusing the study on one country, Brazil, the selection bias across different privatization programs from governments with different political ideologies is avoided (Aguilera et al., 2012). Nevertheless, Brazilian privatized companies, mostly sold during the 1990s during the PND program, might have been subject to the selection bias observed by Megginson and Netter (2001). To avoid this bias, the sample was limited to companies in regulated sectors, excluding the firms in competitive industries such as steel, mining, oil, gas, chemicals, and aircraft. Moreover, since the selected companies fell under the same regulatory framework and shared similarities in terms of operations and size, for comparative purposes, industry factors that could affect performance were not an issue that could impact results. It is often argued that regulated industries form their own subset of industrial organizations (Boubakri et al., 2009), because they are generally state monopolies subject to regulations and political and institutional issues that hardly concern manufacturing or competitive industries. The regulation issue is particularly important in utility firms, specifically natural monopolies, since consumers need to be protected from abuses once the monopoly switches from public to private ownership through a well-designed regulatory framework, which covers both types of

existing companies, if they co-exist. Additionally, Megginson and Netter's (2001) empirical analysis suggests that privatization outcomes in terms of performance are also industry specific. Therefore, narrowing the sample to the regulated sector in Brazil attempts to reduce the selection bias related to industry selection.

Second, the panel regression models with random and fixed effects were also designed to solve the unobserved heterogeneity in units' problem. With an individual specific constant that captures all time-variant observed and unobserved characteristics, the bias arising from unobserved heterogeneity can be removed (Djankov and Murrel, 2002; Estrin et al., 2009).

Finally, the dynamic generalized method of moments (GMM) with IVs (Gupta, 2005) and DiD models were applied to further compare the performance of SOEs and privatized firms (Lazzarini and Musachio, 2018). The models are explained in detail in the next section.

Other biases, when comparing privatizations from different countries, occur because industrialized nations have better performing companies and more data available (Megginson et al., 2004). Another bias is survivorship, which happens when firms go bankrupt after privatization and are excluded from the sample (Boardman et al., 2016). These biases were avoided in the sample selection process in this study because only Brazilian companies and regulated listed SOEs and privatized firms were included in the sample. Conversely, some scholars have argued that low-performing SOEs are more likely to be privatized (Radic, 2021) because governments are unwilling or unable to provide the investments and close monitoring required to restore profitability, which would explain why the most inefficient firms experience the greatest improvements in efficiency. This study's sample selection also avoids these biases.

5.3 Variables Description

In order to examine the companies' performance, financial ratios were used based on the premise that they are reliable proxies to access firms' economic performance and have been used in prior studies, such as Boubakri and Cosset (1998), Dewenter and Malatesta (2001), Megginson et al. (2004), Gupta (2005), Lazzarini and Musacchio (2018) and Attia et al. (2017) when comparing SOEs against privately-owned companies or comparing SOEs before and after privatizations. The first group of variables are related to firms' profitability. Return on assets (ROA), return on equity (ROE) and operating profit margin (OP). ROA can be highly influenced by leverage and capital intensity, and the use of control variables were added in the models. In addition to the analysis of profitability, dividend yield was included to measure

potential difference in the return to the shareholder in the form of actual dividend payment over the 15-year period.

The second group of variables aim to investigate efficiency, mostly regarding labor use. Labor efficiency has been analyzed by La Porta and Lopez-de-Silanes (1999), Gupta (2005) and Boardman et al. (2016). State ownership has been often associated with labor inefficiency and, consequently, value destruction to shareholders. In one of the earlier studies of the theme, Shleifer (1998) pointed out that SOE inefficiencies were a natural outcome of the absence of incentives for firm managers due to the separation of ownership and control. Even listed firms in so-called partial privatizations (Gupta, 2005), which are exposed to market pressures, presented signs of government interference through political goals, including maximizing employment and wages, related to investment decisions. The measure for labor efficiency was derived by dividing total assets and total sales by the number of employees for each fiscal year. (Gupta, 2005 and Dewenter and Malatesta, 2001).

Thirdly, we investigated the impact of state ownership on firms' market value. Boubakri, et al, (2018) compared market value of listed companies in Asia to associate a value premium for SOEs. Prior research (Lins, 2003, Beuselinck et al., 2017, Lazzarini and Musacchio, 2018) also compared firm value with ownership to identify the impact of control on the market view. Because market valuation often considers cash flow generation forecasts, the analysis adds to the study the perception of future prospects in addition to historical measures from accounting numbers.

Finally, considering the recent discussion on the impact of ESG on firms' value, we also investigated if there is a relationship between ESG scores and state ownership. ESG scores from Bloomberg were used, which comprises scores for a range of attributes such as governance, social work and carbon emissions.

Performance results, that will be measured by the dependent variables, can also be an effect of market power and economic conditions, as opposed to management efficacy. Therefore, the following controlling variables were used: firm size, measured by the logarithm of total assets, leverage, capital expenditures by total assets and GDP growth, variables that might confound a clear understanding of the effect of ownership on firm performance. (Dewenter and Malatesta, 2001, Lins, 2003, Beuselinck et al., 2017, Lazzarini and Musacchio, 2018, Boubakri et al., 2018). Variables and descriptions are detailed in Table 2.

Table 2 – Variables description and reference

Symbol	Variable	Description	Previous Research
	Dependent		
Profitability			
ROA	Return on Assets	$Net\ Profit_{\ t}/Total\ Assets_{\ t\ t-1}$	Boubakri and Cosset (1998), La Porta and Lopez-de Silanes (1999), Gupta (2005), Dewenter and Malatesta (2001), Megginson et al., (2014) Boardman et al (2016), Lazzarini and Musacchio (2018), and Boardman et al (2016)
ROE	Return on Equity	$Net\ Profit_{\ t}/Total\ Equity_{\ t\ t-1}$	
OP	Operating Profit Margin	$Operating\ Profit_{\ t}/Total\ Revenue_{\ t}$	
Dividend Yied			
DY	Dividend Yield	$Dividend_{\ t}$ / $Total\ Equity_{\ t}$	
Efficiency			
SEf	Sales Efficiency	$Total\ Revenues_{\ t}/Employees_{\ t}$	
AEf	Asset Efficiency	$Total\ Assets_{\ t}/Employees_{\ t}$	
Market Value			
MTB	Market to Book	$\frac{Share\ Price \times Total\ Shares\ Outstanding_t}{Book\ Value\ of\ Equty_{\ t}}$	Boubakri et al (2018) and Beuselinck (2017)
ESG			
ESG	Environment Social Governance	*Bloomberg ESG Score*	Boubakri et al (2019)
	Explanatory and Control		
GOV	Ownership	*Dummy variable set to 1 if government controlled and 0 otherwise*	Dewenter and Malatesta (2001), Tian and Estrin (2008) Lazzarini and Musacchio (2018), Boubakri et al. (2018)
SIZE	Total assets	$ln\ Total\ Assets_{\ t}$	Boubakri (1998), Gupta (2005), Lazzarini and Musacchio (2018)
LEV	Leverage	$Total\ Debt_{\ t}/Total\ Assets_{\ t}$	Boubakri and Cosset (1998), Nars and Cosset (2014), Boubakri et al (2018), Lazzarini and Musacchio (2018)
CAPEX	Capital Expenditures/ Total Assets	*Fixed Assets Cash Flow* $_t$ / *Total Assets* $_t$	
GDP	GDP growth	*% GDP* $_{t-1}$	Gupta (2005), Lins et al (2017)

Source: elaborated by the author.

5.4 Methodology

5.4.1 Panel Regressions

To compare the effects of state ownership on firm performance, the study mainly employed panel regressions. This statistical method allows both cross-sectional and time-series variations of the sample data to be captured. Hsiao (2014) points to the advantages of controlling the impact of omitted variables that correlate to explanatory variables, by utilizing information on both the intertemporal dynamics and individuality of companies being analyzed. As the results can be relevant for future investment decisions, panel data also generate more accurate predictions for individual outcomes, especially when the number of companies is limited. Different estimation methods were included: pooled, fixed effect (FE), time fixed effect (TFE), two-way fixed effects (TWFE) and random effects (RE). Panel data models and fixed effect estimations reduce the potential problem that omitted variables are correlated to explanatory variables (Arellano and Bover, 1995). Other firm characteristics, such as company growth, capital expenditure, institutional ownership, and foreign ownership, may be potentially endogenous to firm performance.

Lastly, panel regressions are ideal for investigating homogeneity versus heterogeneity between cross-section units. The models' basic assumption is that the effects of omitted variables are driven by individual time-invariant, period individual-invariant and individual time-varying variables (Hsiao, 2014), while the TWFE estimator simultaneously adjusts for unobserved unit-specific and time-specific confounders.

The following equation is used for the panel regression models:

$$DEP_{it} = \alpha_t + \beta_1 GOV_{it} + \beta_2 Controls_{it} - + \varepsilon_{it} \quad (1)$$

Dependent and controlled variables are described in Table 2. GOV is a dummy variable, which is 1 if controlled by the government and 0 if it is privatized. Given the governance model used in Brazil, although government participation in companies varies, full control is determined by holding 50% +1 shares with voting rights. Thus, the use of a dummy variable for SOEs in Brazil is more appropriate than the percentage of shares owned by the state (Megginson, 2001).

5.4.2 Generalized Method of Moments (GMM)

In addition to panel regressions, the models were also estimated using system GMM. Due to the potential bias of endogeneity, the efficiency of estimates and the independence between effects and regressors may be questioned. The dynamic nature can then be captured by the system GMM estimator without bias or inconsistency, and the precision of estimators can be improved. Researchers can consider more explanatory variables in a regression without being concerned about inconsistencies caused by the correlation between regressors and errors. Despite ample evidence in empirical research presented by panel regressions, the use of system GMM adds further compliance to the validity of results. System GMM regressions were used with lagged terms of predetermined variables as instruments as well as with external instruments, which are detailed in Section 6.4. Another major advantage is that the dynamic model can address endogeneity from different sources, including unobserved heterogeneity, simultaneity, and reverse causality. Therefore, the use of dynamic models with IVs were used to retest the hypotheses.

5.4.3 Difference-in-Differences (DiD)

Brazil's change in government in 2016 due to an impeachment of the former president was followed by economic reforms, including the approval of Law 13.303, which introduced superior governance rules for SOEs (Fontes-Filho, 2018). In finance, a natural quasi-experiment can be defined as a change in variables that occurs for exogenous reasons (Angrist, 2008). The ways in which SOEs' performance was affected by these changes can be estimated with the DiD method. Profitability and market values were compared before and after 2016, removing the fixed unobservable factors, since firms were subjected to the same environmental changes (Heckman et al., 1997). Considering the law change and the political swing as a natural quasi-experiment, the DiD model was used to compare the performance of SOEs and privatized firms before and after 2016.

To explore how SOEs performed during the years 2006 to 2015, the following equation was estimated:

$$DEP_{it} = \alpha t + \beta 1\,(NewSOELaw)_{it} + \beta 2\,(GOV)_{it} + \beta 3\,(GOVxNewSOELaw)_{it} + \beta 4(Controls)_{it} + \varepsilon_{it} \quad (2)$$

Regression is used to identify whether SOEs underperformed during the years prior to the change in the political environment, including approval of Law 13.303 in 2016, which introduced superior governance rules for SOEs (Fontes-Filho, 2018). A dummy variable *NewSOELaw* was used to indicate the years 2016 to 2020. In accordance with panel regressions, dependent variables include ROA, ROE, OP, SEf, AEf, MTB, and ESG. Using ROA, inferences can be made about firm performance regardless of leverage. ROE and MTB assist in making additional comparable inferences regarding shareholder value, from either historic or market perspectives. Control variables include company size and financial leverage (Lins, 2003; Beuselinck et al., 2017; Boubakri et al., 2018; Lazzarini and Musacchio, 2018). Variables are described in Table 2.

6. RESULTS

6.1 Descriptive Statistics and Univariate Tests

Table 3 provides a summary of the sample composition. Out of all the regulated SOEs listed in the Brazilian stock exchange in the past 15 years, only CEB and CESP were recently privatized, in 2019 and 2018, respectively (CEED and EMAE were privatized in 2021). In the other group, new concessions were auctioned, and new companies were listed as they developed those newly earned concessions, such as Alupar, Eneva, Omega and Taesa. All companies in both groups operate in regulated sectors, having acquired concessions to operate under the same rules and regulatory frameworks, despite the differences in ownership controls.

Table 3 – Sample Composition

This table presents the panel of companies included in the study with the initial year, final year, and number of observations for all variables. There are a total of 12 companies that are SOEs and 22 companies that are privatized listed in the Brazilian stock exchange B3 in the regulated sectors that are concessions of the state (utilities, telecom, road and rail).

SOE				Privatized			
Company	**Initial Year**	**Final Year**	**Total of Observations**	**Company**	**Initial Year**	**Final Year**	**Total of Observations**
Casan	2006	2020	15	AES Brasil	2009	2020	12
CEB	2006	2019	14	Alupar	2013	2020	8
CEED	2010	2020	11	CCR	2006	2020	15
Celesc	2006	2020	15	Coelce	2006	2020	15
Cemig	2006	2020	15	Comgas	2006	2020	15
Cesp	2006	2018	13	CPFL	2006	2020	15
Copasa	2006	2020	15	CTEEP	2006	2020	15
Copel	2006	2020	15	Ecorodovias	2006	2020	15
Eletrobras	2006	2020	15	EDP	2006	2020	15
Emae	2006	2020	15	Eletropaulo	2006	2020	15
Sabesp	2006	2020	15	Energisa	2006	2020	15
Sanepar	2006	2020	15	Eneva	2015	2020	6
				Engie	2006	2020	15
				Equatorial	2006	2020	15
				Light	2006	2020	15
				Neonergia	2006	2020	15
				Oi	2006	2020	15
				Omega	2017	2020	4
				Rumo	2006	2020	15
				Taesa	2007	2020	14
				Tim	2006	2020	15
				Vivo	2006	2020	15
TOTAL			**173**	**TOTAL**			**295**

Source: estimation results.

Tables 4 and 5 present the descriptive statistics for SOEs and privatized companies. In addition to being part of regulated industries, the two samples share similarities in firm attributes. It stands out that, despite the higher number of total assets on average, market capitalization standard deviations were not significantly different. The samples also share similarities in terms of revenue, and the average number of employees for an SOE is 7200, while it is 5900 employees for privatized companies during the analyzed period.

Table 4 - Descriptive Statistics for SOEs

This table presents the summary statistics for SOEs. The average annual ROE for SOEs was 7,6% and the median 8,9% for the period 2006-2020, while the average ROA was 2,4% with median of 3,5%. The lower number of ROE observations is due to the negative equity for CEED from 2015 to 2020. Efficiency is measured by the ratio of revenue to the number of employees (SEf) and total assets to employees (AEf). MTB is the ratio of market value to book value, and for SOEs, both mean and median are below 1x. Leverage (LEV) was calculated by dividing total liabilities to total assets. ESG score was not available for the entire series, thus the lower number of observations. The average number of employees of an SOE is 7.247 thousand, with the smallest company being EMAE, with 393 and the largest one, Eletrobras with 28.544.

		Obs.	Median	Mean	Std. Deviation	Min.	Max.
Profitability							
ROE	Return on Equity (%)	166	8,90	7,62	12,58	-43,70	41,10
ROA	Return on Assets (%)	173	3,50	2,44	6,78	-39,51	16,60
OP	Operating Margin (%)	173	15,70	12,44	21,80	-73,30	94,30
DY	Dividend Yield (%)	173	2,93	4,80	8,17	0,00	58,19
Efficiency							
SEf	Revenue/Employee (%)	171	1,00	1,20	0,96	0,10	5,10
AEf	Assets/Employee (%)	171	2,10	3,65	4,16	0,40	21,50
Valuation							
MTB	Market to Book Value	155	0,70	0,83	0,60	0,10	5,10
ESG							
ESG	ESG Score	104	46,10	45,3	12,2	19,4	66,1
Others							
NP	Net Income Margin (%)	173	9,20	6,72	19,39	-95,00	68,10
LEV	Total Liability/Total Assets	173	0,54	0,57	0,26	0,22	2,43
CAPEX	Capital Exp./Tot. Assets (%)	173	5,00	5,10	4,12	0,00	28,00
DEBT	Total Debt (R$ millions)	173	1.763	6.675	11.530	0	55.817
CASH	Cash (R$ millions)	173	534	1.863	3.599	6	19.645
SIZE	Total Assets (R$ millions)	173	9.498	25.295	42.020	914	181.210
LIABILITY	Total Liabilities (R$ millions)	173	4.785	14.611	25.680	218	130.223
EQUITY	Total Equity (R$ millions)	173	4.809	10.684	17.760	-5.743	80.349
REVENUE	Revenue (R$ millions)	173	3.521	7.447	8.565	96	33.927
MKTCAP	Market Capitalization (R$ millions)	155	5.401	8.908	10.970	131	59.377
DIVIDEND	Dividend Paid (R$ millions)	173	54	384	846	0	4.982
EMPLOYEES	Number Employees (thousands)	171	6.382	7.247	6.740	393	28.544

Source: estimation results.

Table 5 - Descriptive Statistics for Privatized Companies

This table presents the summary statistics for privatized companies. The average annual ROE for SOEs was 17,0% and the median was 15,8% for the period 2006-2020 while average ROA was 6,5% and median 5,9%. Efficiency is measured by the ratio of revenue to the number of employees (SEf) and total assets to employees (AEf). MTB is the ratio of market value to book value, and for privatized companies, the mean is 1,9x while the median is 2,75x. Leverage (LEV) was calculated by dividing total liabilities to total assets. ESG score was not available for the entire series, thus the lower number of observations. The average number of employees of a privatized company is 5.856 thousand, with the smallest company being Omega Energia, with 92 and the largest one, Vivo with 33.847.

		Obs.	Median	Mean	Std. Deviation	Min.	Max.
Profitability							
ROE	Return on Common Equity (%)	295	15,84	16,96	19,77	-70,97	207,40
ROA	Return on Assets (%)	295	5,90	6,50	5,94	-17,54	34,15
OP	Operating Margin (%)	295	23,30	28,77	21,06	-27,90	107,00
DY	Dividend Yield (%)	295	5,02	8,10	18,86	0,00	227,03
Efficiency							
SEf	Revenue/Employee (%)	293	1,80	2,48	1,96	0,30	9,30
AEf	Assets/Employee (%)	293	3,60	6,66	8,42	0,80	75,56
Valuation							
MTB	Market to Book Value	264	1,85	2,75	3,68	0,08	39,10
ESG							
ESG	ESG Score	189	47,9	46,9	11,9	18,2	72,7
Others							
NP	Net Income Margin (%)	295	11,60	14,73	16,40	-55,57	90,90
LEV	Total Liability/Total Assets	293	0,62	0,58	0,21	0,06	0,99
CAPEX	Capital Exp./Tot. Assets (%)	295	5,31	5,97	4,48	0,00	28,00
DEBT	Total Debt (R$ millions)	295	4.237	6.411	7.078	1	59.857
CASH	Cash (R$ millions)	295	1.180	1.870	1.960	12	16.826
SIZE	Total Assets (R$ millions)	295	12.768	18.880	20.010	1.308	108.738
LIABILITY	Total Liabilities (R$ millions)	295	7.865	11.450	11.790	774	83.478
EQUITY	Total Equity (R$ millions)	295	4.276	7.426	11.010	56	71.607
REVENUE	Revenue (R$ millions)	295	5.867	8.674	8.727	509	44.268
MKTCAP	Market Capitalization (R$ millions)	262	7.448	13.195	13.636	1.058	82.814
DIVIDEND	Dividend Paid (R$ millions)	295	408	939	1.583	0	8.839
EMPLOYEES	Number of Employees (thousands)	287	4.160	5.856	6.384	92	33.847

Source: estimation results.

Table 6 shows the results for the univariate and Mann-Whitney tests, and the differences in their means and medians between the two groups. The differences in firm performance between the two groups indicate preliminary insights. The mean and median differences in

profitability, efficiency and market values are positive and significant at a 1% level. From the raw data, it appears that relative to privatized firms, SOEs are less profitable and less efficient, invest less, and are somewhat less leveraged. It also seems that the market penalizes SOEs with a significantly lower valuation with SOEs trading on average below 1x their book value, compared to almost 3x higher book value for privatized companies. It becomes apparent in the comparisons that the difference in performance is not only statistically significant, but also large. Referring to the studies of Dewenter and Malatesta (2001), Boardman et al. (2016), and Musacchio and Lazzarini (2018), the preliminary analysis of the Brazilian sample has resulted in similar conclusions: SOEs underperform their privatized peers in all measures, financial or market based, from 2006 to 2020.

Table 6 – Univariate and Mann-Whitney Tests

This table presents the statistical tests of differences in means and medians of firm characteristics for SOEs, companies that are state-controlled, and for privatized companies, for all variables in the sample. The p-values report the significance of the differences in the tests.

	SOEs Mean	Privatized Mean	T-Test	SOEs Median	Privatized Median	MW Test
Profitability						
ROE	7,62	16,96	-6.1914***	8,90	15,84	15293***
ROA	2,44	6,50	-6.536***	3,50	5,90	17006***
OP	12,44	28,77	-7.9194***	15,70	23,30	16407.5***
DY	4,80	8,10	-2.6107***	2,93	5,02	20458***
Efficiency						
SEf	1,19	2,48	-9.4724***	1,00	1,80	13390***
AEf	3,65	6,66	-5.1401***	2,10	3,60	16080.5***
Valuation						
MTB	0,83	2,75	-7.5636***	0,70	1,85	5374***
ESG						
ESG	45,34	46,90	-1,3836	46,10	47,90	8981
Others						
NP	6,72	14,73	-4.5602***	9,20	11,60	20531***
LEV	0,57	0,58	-0,2994	0,54	0,62	20469.5***
CAPEX	5,10	5,97	-2.3794***	5,00	5,30	23358***
DEBT	6.675	6.411	0,2718	1.763	4.237	17550.5***
CASH	1.863	1.870	-0,0251	534	1.180	18536***
SIZE	25.295	18.880	1.8878*	9.498	12.768	21723.5***
LIABILITY	14.611	11.450	1,5256	4.785	7.865	20705.5***
EQUITY	10.684	7.426	2.1804*	4.809	4.276	24663
REVENUE	7.447	8.674	-1,4851	3.521	5.867	21340***
MKTCAP	8.908	13.195	-3.7298***	5.401	5.515	14288.5***
DIVIDEND	384	939	-4.9338***	54	408	15965***
EMPLOYEES	7.247	5.856	2.1788*	6.382	4.160	27711

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

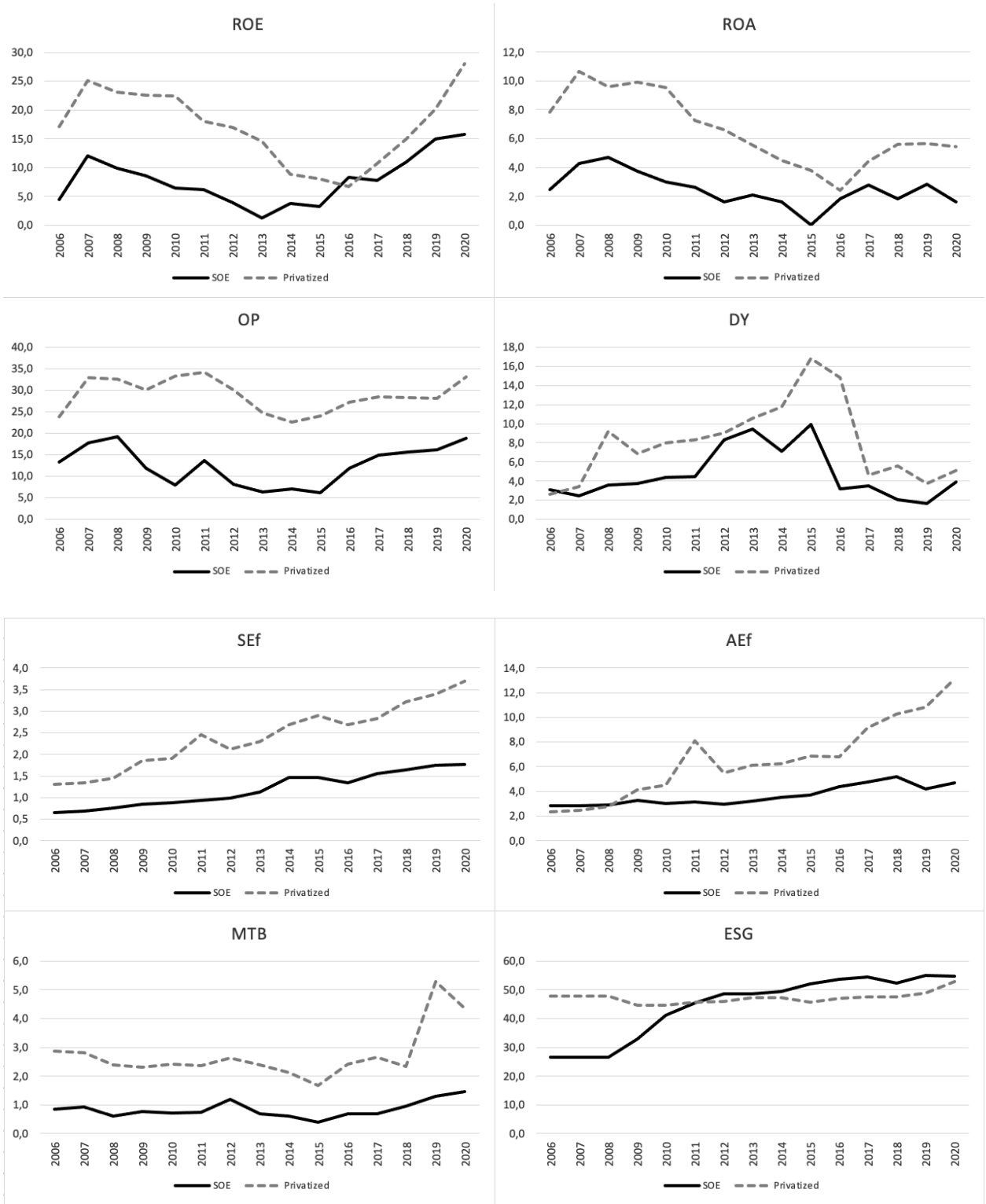
Figure 1 illustrates that the overperformance of privatized companies is, on average, consistent throughout the years. Privatized companies exhibit, on average, higher profits measured by both ROE, ROA, and operating profit, regardless of the economic cycle or the political inclination of the government. It is apparent, however, that SOEs' average performance increased at a faster pace after 2016, which is further analyzed in section 6.5. Higher leverage for privatized companies can partly explain the higher ROE, but not the difference in ROA, which is also consistent across the period.

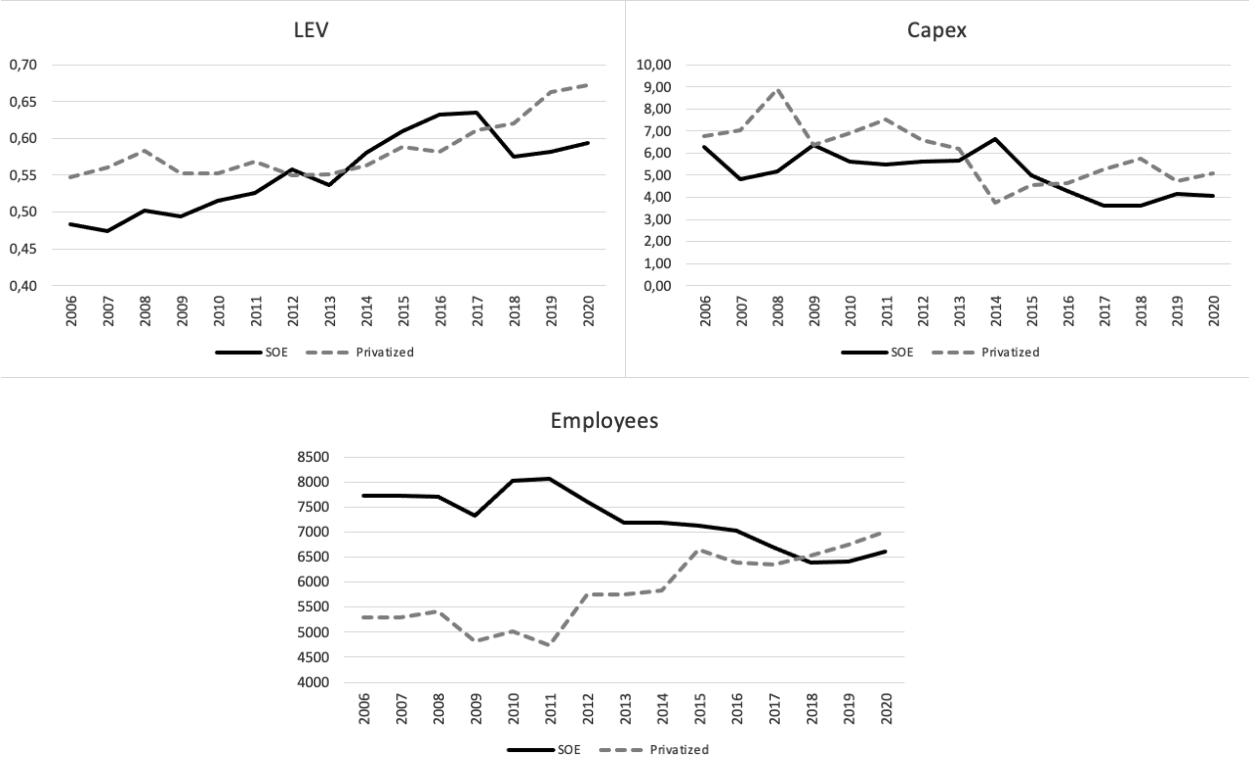
Comparing the efficiency between the two groups from 2006 to 2020, the advantages to privatized companies are clear. Interestingly, efficiency improvements seem to be continuous during the time series, with accelerated gains after the crisis in 2014 and 2015, for both SOEs and privatized companies. Specifically, for SOEs, the divesture of some subsidiaries and assets after the change in government in 2016 has resulted in a lower number of employees on average, which is also analyzed using regressions on labor efficiencies and government ownership in Section 6.2.

The difference in market valuations between the two groups is also present and consistent during the period. Market participants apply greater discounts to the values of SOEs, probably reflecting a perception of higher risk perceived. There was an increase in market to book ratios for SOEs after the change in government in 2016, with the newly implemented Law N. 13.303 and the announcement of a new privatization program. There was also a noticeable reduction in the average number of employees, with divestures from Eletrobras, which sold its energy distribution subsidiaries, and the sale of CEB and CESP in 2018 and 2019 contributing to this trend. DiD analysis were performed to account for these changes and are presented in Section 6.5. Conversely, ESG scores and capital investments, as measured by Capex cash flow per total assets do not appear to differ between the two groups over time. Capex has slowed down, consistent with a weaker economy overall, while ESG scores continue to improve for both groups, as companies take measures to increment environmental, social, and governance matters, following a more global trend.

Figure 1. Average performance by type of control

In Figure 1, graphs show the variable comparisons across the period for the two samples: SOEs and privatized companies. Means were calculated using the variables for the period 2006 to 2020. The black line refers to the SOEs' mean, while the dotted gray line shows the mean for Privatized companies.





Source: estimation results.

6.2 Panel Regressions

First, the panel regressions with versions of Equation (1) in a variety of specifications were used, before addressing issues of dynamics and endogeneity with the GMM method.

Table 7 contains the panel regression results for firm performance in terms of profitability, efficiency, and market value. Ownership structure is an important factor in shaping corporate governance (La Porta, 1999) and the present study found that SOEs in Brazil underperform their privatized peers in all measures: ROE, ROA, operating profit, labor efficiency, and market value. On profitability measures, on average, SOEs' returns on assets are 4 percentage points lower, their returns on equity are 9.7 percentage points lower and their operating profit margins are 18 percentage points lower. These findings are consistent with several previous empirical studies of global SOEs (Dewenter, and Malatesta, 2001; Djankov and Murrel, 2002; Gupta, 2005; Megginson, 2017; Lazzarini and Mustachio, 2018). Leverage was negatively related to profitability in the case of ROA and OP. Capex is not statistically significant in explaining performance. Size, measured by the log of total assets, is also positively correlated with efficiency. Regulated companies, especially in the utility sector, are known to be less responsive to economic cycles, and during the analyzed period, GDP growth

had only a small positive impact on the companies' ROE, ROA, OP. Although ROE was significantly higher in the case of privatized companies, the panel regressions with dividend yield did not result in statistical difference between the two groups, a different result compared to previous global research that showed privatized companies also pay higher dividends than SOEs (Goyal et al., 2020).

Table 7 – Regression Results – Firm Performance

This table presents the Random Effects panel regression results for all 34 companies from 2006 through 2020. The dependent variables ROE, ROA, Operating Profit and Dividend Yield are measured in %, while SEf, AEf and MTB are ratios (describe in table 1). The explanatory variables were GOV, a dummy 1 if the company was state-controlled or 0 otherwise. The definition of state control is 50% + 1 of voting shares. SIZE, the log of total assets, is measured in R$ millions, LEV is the ratio of total debt to total assets, CAPEX, the ratio of capital expenditure to total assets, and GDP growth was measured in % annual change. The values in parenthesis are the robust standard errors. All estimated models, Pooled, Fixed Effect, Time Fixed Effect, Two-way Fixed Effects and Random Effects are presented on Appendix 1.

	ROA	**ROE**	**OP**	**DY**	**SEf**	**AEf**	**MTB**
GOV	-4.4300***	-9.7320***	-18.2500***	-2,471	-1.4140***	-4.6330*	-1.3370***
	(-1.499)	(-3.279)	(-5.33)	(-2.318)	(-0.5464)	(-2.77)	(-0.4598)
SIZE	-1,245	-0,2869	-0,6092	3,568	0.7023***	2.3630***	0,0593
	(-0.8188)	(-1.193)	(-1.421)	(-2.756)	(-0.1465)	(-0.5198)	(-0.1873)
LEV	-12.2700***	11,18	-7.0920*	-22,75	0,3337	1,448	7.1200*
	(-4.422)	(-15.59)	(-4.033)	(-18.49)	(-0.3784)	(-1.176)	(-3.995)
CAPEX	0,0702	0,2914	-0,0845	0,038	-0,0073	-0,049	0,0294
	(-0.1284)	(-0.1838)	(-0.2931)	(-0.1096)	(-0.0112)	(-0.0455)	(-0.0327)
GDP	0.1532**	0.6231***	0.3218**	-0,2024	-0,0225	0,0098	0.0380**
	(-0.0781)	(-0.2182)	(-0.1386)	(-0.2589)	(-0.0139)	(-0.0575)	(-0.0183)
Constant	24.4300***	9,575	39.6200***	-11,78	-3.9090***	-13.930***	-2,288
	(-8.084)	(-11.8)	(-14.23)	(-14.63)	(-1.378)	(-4.505)	(-3.543)
Observations	466	459	466	466	464	464	417
R2	0,1974	0,0407	0,042	0,0862	0,2888	0,2446	0,1054
Adjusted R2	0,1887	0,0301	0,0316	0,0763	0,2811	0,2364	0,0945
F-statistics	115.700***	22.250***	15.590***	42.540***	173.400***	134.700***	47.540***

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

The "grabbing hand of the government", as described by Shleifer and Vishny (1998) continues to play a role in the Brazilian case, despite the privatization program in the country starting many years ago. The differences found in the analysis of Brazilian SOEs are economically relevant. For example, being controlled by the government can lead to annual

returns on equity being, on average, 9.7 percentage points lower if privatized. Over a period of 15 years, that difference accumulates almost 300% in additional shareholder return. Besides the negative impact on minority shareholders, the lower returns over the years can also reduce potential growth and investments, resulting in a loss of productivity for the economy at an aggregate level (Djankov and Murrel, 2002, Megginson, 2017).

Operating efficiency, measured by the ratio of sales as well as assets to employees, also shows a significant negative relationship to state ownership. Lower profitability can be attributed to distortion in labor, as agency and information asymmetry problems allow politicians to influence managers and ignore the financial objective of generating value for shareholders. With R2 varying from 0.24 to 0.29 in the random effects model, in table 7, labor intensity associated with government ownership is quite significant, particularly considering the comparison of companies that operate in the same regulated sector. These findings on labor inefficiency and state ownership associations in Brazil are comparable to those documented in previous global studies (Boardman and Vining, 1989; Megginson, 1994; Boubakri, 1998; Dewenter and Malatesta, 2001). In the Brazilian context, the high employment rate at SOEs was predictable, since protective laws and labor unions restrict layoffs in companies since most SOE employees belong to well-organized labor unions that are directly affiliated to major political parties. Private firms employ human resources more efficiently, focus on profitability, maximize returns to shareholders, and are free from political interference, which in most cases result in better labor practices. In contrast, managers in SOEs not only pursue political objectives that differ from profit maximization, but are also entrenched bureaucrats (Boycko, 1996). The persistent inefficiency in SOEs is a substantial factor that weakens economic growth through lower productivity gains. Reducing surplus employment would then probably lead to further improvements in the allocative efficiency and profitability of Brazilian SOEs, thus improving aggregate productivity in the economy, which could be a subject for future research.

Panel regressions on market performance, measured by market to book ratios, also confirmed that state control is perceived as a negative component of value by investors. MTB ratios for SOEs are, on average, 1.3 times lower than privatized peers, controlled by size, leverage, capex, and economic growth. Although previous research has found a positive association between market value and government ownership, it usually applies when the government is a minority shareholder or in developed countries with stronger regulatory institutions that offer better protection to minority investors (Beuselinck, 2017; Lazzarini and Musacchio, 2018). In such instances, the soft budget constraint, or the ability of SOEs to access

less expensive loans, reflect in lower costs of debt and extra support during financial crises, which leads to a high valuation by market participants.

However, when a government is in control, the political view dominates, and this results in a discounted valuation (Boubakri et al., 2018). The case of Brazilian SOEs that are controlled by the government falls into the latter, lower valuation by investors, who may discount future cash flows at a higher equity premium, or by lowering future prospect for value creation, considering the risk that the government may negatively interfere, using the firm for political purposes, that goes against value creation for shareholders. Higher equity premium for a portfolio of Brazilian SOEs, especially during financial crises, have been previously documented (Vitoria et al., 2020) and the difference found in panel regressions for MTB for SOEs and privatized companies confirms that view.

The combination of weaker financial performance, lower efficiency, and lower market value demonstrates the negative impact of government control over corporations in Brazil. The relatively large number of employees result in lower efficiency and lower returns to shareholders, a clear sign of weak governance related to agency problems. The consistent underperformance of SOEs can be interpreted that being controlled by the government means that a company in Brazil can be used for political purposes that are not oriented to creating value for its shareholders, even if the company is listed on the stock exchange and relies on private capital from minority investors, who will suffer the most from this mismanagement. The long period over which the sample was analyzed, including different economic cycles and different governments, shows consistent underperformance. Consequently, investors penalize SOEs by constantly valuing them at lower multiples, which results in a higher cost of equity for government-owned firms, compounding their difficulties when there are economic slowdowns or government budget constraints.

The final panel regression compared ESG scores for SOEs and privatized firms, in Table 8 below. The coefficient GOV was not statistically significant, and we cannot conclude there is a relationship between ESG and private or state ownership in Brazil. However, ESG scores appear to be positively related to size. Large companies are better prepared to improve measures related to social, environmental, and corporate governance issues. Literature on the subject is still sparse, as ESG scores are relatively new. Further investigation on the subject might be conducted in order to reevaluate this relationship, since corporate governance, social and environmental responsibility are associated with higher valuation (Lins et al. 2017,

Boubakri et al. 2018). Particularly in Brazil, the breakdown of the score can help further studies identify relationship between performance and corporate governance metrics, as conflicts of interest and the political use of SOE can be detrimental to profitability.

Table 8 – Regression Results – ESG

This table presents the Random Effects panel regression results for the dependent variables ESG, measured by Bloomberg score. The explanatory variables were GOV, a dummy 1 if the company was state-controlled or 0 otherwise. The definition of state control is 50% + 1 of voting shares. SIZE, the log of total assets is measured in R$ millions, LEV is the ratio of total debt to total assets, CAPEX, the ratio of capital expenditure to total assets, and GDP growth was measured in % annual change. The values in parenthesis are the robust standard errors. All models, Pooled, Fixed Effect, Time Fixed Effect, Two-way Fixed Effects and Random Effects are presented on Appendix 1

	ESG
GOV	-1,721
	(-3.191)
SIZE	6.2160***
	(-1.645)
LEV	0,9501
	(-7.51)
CAPEX	0,1513
	(-0.1711)
GDP	-0.6284***
	(-0.2098)
Constant	-14,1
	(-17.19)
Observations	293
R2	0,2117
Adjusted R2	0,198
F-statistic	79.5600***

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

6.3 Panel Regressions Robustness Checks

To test the robustness of the results, several different models were tested. These included a balanced panel which included only firms with complete data from 2006 through 2020, eliminating companies that were privatized during the period or new companies that began operations after 2006, a data panel excluding outliers (using the Mahalanobis distance criterion), and a panel considering only the companies in the electricity and water sectors, in

which regulations are even more similar and all SOEs are controlled by regional governments. The results did not vary, as the GOV coefficient was negative for all cases with a similar significance and magnitude. Table 9 presents the regression results for the balanced panel without outliers.

Table 9 – Profitability Regression Results – Balanced Panel without Outliers

This table presents the panel Random Effects regression results using a balanced panel without outliers, reduced to 20 companies. The dependent variables ROE, ROA, Operating Profit are measured in %, while SEf, AEf and MTB are ratios (describe in table 1). The explanatory variables were GOV, a dummy 1 if the company was state-controlled or 0 otherwise. The definition of state control is 50% + 1 of voting shares. SIZE is the log of total assets measured in R$ millions, LEV is the ratio of total debt to total assets, CAPEX, the ratio of capital expenditure to total assets, and GDP growth was measured in % annual change. The values in parenthesis are the robust standard errors. All models, Pooled, Fixed Effect, Time Fixed Effect, Two-way Fixed Effects and Random Effects are presented on Appendix 1.

	ROA	ROE	OP	Sef	AEf	MTB
GOV	-2.2360**	-7.5410***	-8.5080*	-1.2320**	-1,693	-1.4310***
	(-1.046)	(-2.624)	(-5.002)	(-0.6014)	(-2.107)	(-0.2966)
SIZE	-1.8320***	-3.4620***	-1,726	0.7080***	2.0580***	-0,0728
	(-0.5377)	(-1.285)	(-1.5)	(-0.1795)	(-0.4859)	(-0.1967)
LEV	-5,084	7,055	-8,164	-0,2247	1,319	1.2910*
	(-3.609)	(-7.486)	(-7.286)	(-0.796)	(-1.694)	(-0.6654)
CAPEX	0.1829*	0.3953*	-0,0453	0,0139	-0,0073	0,0204
	(-0.1009)	(-0.223)	(-0.3723)	(-0.0149)	(-0.0588)	(-0.0163)
GDP	0,0913	0.3705**	0,2969	-0.0433***	-0,07	0.0353***
	(-0.0641)	(-0.1835)	(-0.1868)	(-0.015)	(-0.0441)	(-0.0096)
Constant	26.0500***	44.4200***	48.2100***	-4.2790**	-14.6100***	2,111
	(-5.349)	(-12.48)	(-16.67)	(-1.838)	(-4.832)	(-1.937)
Observations	282	282	282	282	282	282
R2	0,1855	0,1245	0,0666	0,2977	0,3902	0,0987
Adjusted R2	0,1708	0,1086	0,0497	0,285	0,3791	0,0823
F-statistics	62.1400***	38.9700***	11.5400**	114.700***	171.900***	27.1900***

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

6.4 Endogeneity and the Dynamic GMM Model

Despite the narrowed sample and the robust panel regressions with pooled, random, and fixed effects, there are still indications of endogeneity in some results. Findings could be biased due to a correlation between the error terms and explanatory variables. The Hausman test detected endogenous regressors in some models, as presented in Table 10.

Table 10 – Panel Regressions endogeneity Test

This table show the Hausman test statistics for all regression residuals.

	Pooled	FE	FTE	FTW	RE
ROE	2,5656**	1.4451	2.5150**	1.1469	1.4481
ROA	3.3743***	1.6029	3.3971***	1.1596	1.6816*
OP	1.2754	2.0029**	1.2587	2.4886**	0.3433
SEf	5.5061***	6.6447***	5.8300***	4.9488***	2.3177**
AEf	4.4977***	11.7583***	4.5843***	10.0844***	2.8884***
MTB	-0.6765	-0.5526	-0.7563	-1.0419	-0.1025

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

Unobservable ownership effects, including those stemming from the selection of firms for privatization, can be correlated with the explanatory variables and error terms in the model and do not change over time (Estrin, 2009). Therefore, fixed effect estimators can potentially be biased on the assumption of time-invariant or group-invariant omitted variables (Goyal et al., 2020). Although this issue was addressed by limiting data to the regulated sector in a single economy that was not completely privatized, as was the case in competitive industries such as steel and mining, endogeneity may still exist, and the random and fixed effects model does not address a selection bias. In addition, other firm characteristics, such as size, leverage, capital expenditure, and economic growth, may be potentially endogenous to firm performance. (Djankov and Murrel, 2002; Dinç and Gupta, 2011; Ben-Nars and Cosset, 2014; Megginson et al., 2014).

Therefore, the endogeneity issue is further addressed using the system GMM estimation technique (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundel and Bond, 1998). Following Gupta (2005), Ben-Nars and Cosset (2014), and Megginson et al. (2014), some of the assumptions of the fixed effects model were relaxed and a lagged dependent variable was used as an instrument in the specification. The idea is to reduce the bias in the estimates by accounting for potential endogeneity in lagged variables in the panel models. Additionally, GMM allows the models to control for time-varying unobservable factors that companies in the sample may face (Arellano and Bond, 1991). The system GMM method is appropriate considering that the study comprises an unbalanced panel covering a time span of 15 years and uses dummies as dependent variables (for government ownership). All independent variables

are assumed to be endogenous and lagged and used as IVs. Robust standard errors clustered around the firm are used to control for heteroskedasticity. The validity of instruments is detected using the Hansen or the Sargan tests.

Table 11 contains the results for the system GMM models using the lagged variables as instruments. The significance of GOV was slightly weaker for ROA and operating profit when using the system GMM method compared to the Random Effects Regression (Table 7), but the results still report a negative relationship between state ownership and performance with a similar magnitude for the coefficients presented in the panel regressions. The coefficient for GOV related to efficiency and measured by total assets per employee (AEf) was not statistically significant, but sales per employee (SEf) presented a similar negative result as the previous models. Finally, MTB is also negative and has a strong significance related to government ownership, although with a lower magnitude of 1.5x.

Columns AR (1) and AR (2) tests for first- and second-order serial correlations in the first differenced residuals, under the null hypothesis of no serial correlation, indicate that the null hypothesis of there not being any second-order serial correlations cannot be rejected. The Hansen test of over-identification is used to examine the validness of IVs in the system GMM method, under the null hypothesis that IVs are valid.

Table 11 – GMM Regression Results

This table presents the results from system-GMM regression approach to addressing potential endogeneity problems with state-ownership. The variables are 1-year lag differences. Robust standard errors clustered around the firm are presented below the estimates in parenthesis. The results of AR (1) and A (2) are first order and second order serial correlation tests. Hansen tests the exogeneity of the lagged instruments. Sargan tests that the over-identifying restrictions are valid.

	ROA	**ROE**	**OP**	**SEf**	**AEf**	**MTB**
GOV	-2.6492*	-7.8723***	-12.922**	-0.9893**	-2.2901	-1.4767***
	(1.3226)	(3.1993)	(6.2443)	(0.3694)	(1.4894)	(0.4648)
SIZE	-0.0001*	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
LEV	-8.1464**	9.4743	-5.9394	0.3133	-0.6961	3.3804
	(3.3764)	(11.8252)	(14.1121)	(0.7575)	(3.1063)	(2.0167)
CAPEX	0.3840***	0.8249***	0.0080	-0.0071	-0.2312	0.0359
	(0.1390)	(0.26680)	(0.6600)	(0.0365)	(0.1816)	(0.0422)
GDP	0.1340	0.4488*	-0.0321	-0.1021***	-0.2993**	0.0137
	(0.1472)	(0.2595)	(0.2827)	(0.0284)	(0.1118)	(0.0226)
Constant	9.1359***	6.9329	33.2021**	2.2504***	8.2906**	0.2716
	(2.0731)	(5.5222)	(14.0131)	(0.5304)	(3.709)	(0.9073)
Observations	466	459	466	464	464	417
Instruments	30	23	30	28	28	20
AR (1)	-2.94***	-2.06***	-1.95**	-0,62	-0,12	-0,75
AR(2)	-0,39	-0,71	-0,08	-1,83	-95	0,55
Sargan-Test	54.74***	19,59	20,42	42.19***	29,3	3,28
Hansen-Test	11,39	13,78	12,06	13,85	13,77	9,31

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

Next, in addition to using lags for the original variables, three other IVs were included in the GMM models. The first IV was the log of the number of employees, as the state would probably be more inclined to retain ownership in a company with a larger number of employees, due to political concerns over job losses (Borisova and Megginson, 2011; Borisova, 2012). The second IV was foreign ownership of privatized companies. Privatization to foreign investors have resulted in significant performance improvements, compared to other types of privatizations (Megginson 2001, 2017; Djankov and Murrel, 2002). Companies that are controlled by foreign investors could have been selected first for privatization considering the attractiveness and potentially higher bids from foreign investors compared to domestic players, especially for the early PND in the 1990s, when domestic capital markets were not able to fully acquire newly privatized firms in Brazil. The third IV was the economy unemployment rate change, which was included as an explanatory variable for the motivation to privatize or the lack thereof (Borisova et al., 2015; Goyal et al., 2020).

The system GMM method's results, with external IVs, are presented in Table 12. The results were again consistent with previous models, and government ownership remains negative relative to firm performance. For profitability measures, ROE, ROA, and OP coefficients were larger and statistically significant at 10%. This suggests that even after controlling for potential endogeneity of state ownership, unobserved firm heterogeneity, and potential endogeneity of other regressors, overall results are robust to the extent that companies' profitability is negatively related to government ownership. Capex is also positively related to ROA and ROE, although with lower significance. Efficiency was negatively associated with state control, although not significant when measured by total assets (AEf), but only by Sales (SEf). Even after controlling for potential endogeneity, the conclusion is that privatized firms perform better in terms of profitability and are more efficient in allocating human capital when compared to state-owned companies.

Again, AR (1) and AR (2) tests for first- and second-order serial correlations in the first differenced residuals, under the null hypothesis of no serial correlation, indicate that the null hypothesis of there not being any second-order serial correlations cannot be rejected. The Sargan test indicates that the over-identifying restrictions are also valid. The use of external IVs, in addition to the lags of the dependent variables, have improved the models at the same time the results were consistent with previous analysis. Even after controlling for potential endogeneity, state controllership negatively results in lower profitability.

Table 12 – GMM Results with external Instrumental Variables

This table presents the results from system-GMM regression approach to addressing potential endogeneity problems with state-ownership. The variables are 1-year lag differences. Robust standard errors clustered around the firm are presented below the estimates in parenthesis. The results of AR (1) and A (2) are first order and second order serial correlation tests. Hansen tests the exogeneity of the lagged instruments. Sargan tests that the over-identifying restrictions are valid.

	ROA	ROE	OP	SEf	AEf	MTB
GOV	-8.4557**	-16.924*	-36.2471**	-2.9704*	-8.8265	-2.4876
	(3.2714)	(8.5438)	(14.7543)	(1.6454)	(5.5501)	(1.6027)
SIZE	-0.9226	-1.2334	-3.1088	-0.0759	-0.2627	-0.055
	(0.7457)	(1.927)	(3.045)	(0.299)	(0.9852)	(0.2457)
LEV	-9.5416	11.0633	-7.9451	0.5324	-2.266	3.9232**
	(5.8256)	(14.6662)	(12.2708)	(0.9778)	(4.754)	(1.7193)
CAPEX	0.3439*	0.5374*	-0.0948	-0.0294	-0.3642	0.0151
	(0.1786)	(0.2917)	(0.6719)	(0.0408)	(0.2333)	(0.0568)
GDP	0.1668	0.5627**	0.1233	-0.0749***	-0.2285***	0.0299
	(0.1205)	(0.264)	(0.2671)	(0.0238)	(0.0771)	(0.0314)
Constant	19.5234**	20.153	65.5939*	3.547	13.9747	0.6754
	(8.761)	(19.7192)	(33.3663)	(3.148)	(11.4503)	(2.8608)
Observations	428	421	428	426	426	375
Instruments	23	22	23	23	23	23
AR (1)	-2.95**	-1.98	-1.95*	-0,17	-0,14	-0.75
AR(2)	-0.47	-0.75	-0.14	-1,42	-0,92	0.36
Sargan-Test	321.37***	448.60***	401.07***	4476.08***	517782***	665.86***
Hansen-Test	20,56	19,22	20,07	26,72	24,65	21.57

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

As additional robustness checks, system-GMM models with external IVs were also performed using a balanced panel, with more restricted data excluding outliers. Table 13 presents the results which were consistent with the previous models with all coefficients negatively associating state ownership with firm performance, although the magnitude was more similar compared to the panel regression models. For more restricted data, GOV coefficient was also significant, at the 10% level, for AEf and MTB. The coefficient for MTB for SOEs was 3.3x lower, a similar result compared to the panel regression models. The use of different econometric models has provided consistent results when analyzing the impact of state ownership on firm performance.

Table 13 – GMM Results with external Instrumental Variables - Balanced Panel

This table presents the results from system-GMM regression approach to addressing potential endogeneity problems with state-ownership. The variables are 1-year lag differences. Robust standard errors clustered around the firm are presented below the estimates in parenthesis. The results of AR (1) and A (2) are first order and second order serial correlation tests. Hansen tests the exogeneity of the lagged instruments. Sargan tests that the over-identifying restrictions are valid.

	ROA	ROE	OP	SEf	AEf	MTB
GOV	-4.8328*	-13.1168	-21.4156	-1.6457	-3.5979*	-3.3488*
	(2.3333)	(9.1041)	(19.1244)	(1.3724)	(1.9156)	(1.6774)
SIZE	-0.6441	-0.7014	0.8098	0.1184	0.9185	-0.076
	(0.4879)	(1.3989)	(3.1233)	(0.2059)	(0.5459)	(0.266)
LEV	-4.5725	15.6878	-1.4222	0.8625	0.5783	3.8661*
	(4.1136)	(15.4131)	(20.7103)	(1.2372)	(3.1576)	(1.961)
CAPEX	0.2242	0.3584	0.2994	0.0314	-0.0038	-0.0002
	(0.1927)	(0.2914)	(0.6744)	(0.0528)	(0.1531)	(0.0876)
GDP	0.155	0.5441**	0.3308	-0.0628***	-0.1126	0.0033
	(0.131)	(0.2401)	(0.2828)	(0.0211)	(0.0723)	(0.0467)
Constant	14.4918**	14.3508	18.1016	0.2294	-3.9051	1.7177
	(6.7479)	(16.0945)	(36.905)	(2.0575)	(5.8275)	(3.0582)
Observations	311	311	311	311	311	311
Instruments	23	23	23	23	23	23
AR (1)	-2.14**	-1.23	-1.55	-1,27	0,37	-0.65
AR(2)	-0.56	-0.01	-0.26	-1.25	1,4	0.72
Sargan-Test	266.81***	478.44***	189.30***	5419.32***	6771.82***	596.51***
Hansen-Test	13,72	14,79	20,22	13,38	17,27	17.47

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

6.5 Changes in the Macro Scenario and Difference in Differences Analysis

Despite the long period used in the data sample, 2006 to 2020, there was only one major change in the government after the economic crisis that started in 2014 and ended with the impeachment of former president Dilma Rousseff in 2016. The new government started fiscal reforms aimed at controlling the growing government deficit and, more importantly, introduced new legislation for SOEs in 2016 to improve firm regulations (Law 13.303). This created optimism that SOE governance would be strengthened, their autonomy would be increased, and their managements would be professionalized (Fontes-Filho, 2018). Considering these

regulation changes, the analysis of a possible change in SOEs' results, relative to privatized companies, was performed by comparing their metrics before and after 2016, testing if SOEs' indicators would outperform privatized companies, considering the new law. This change in the regulatory environment was investigated using a DiD model, in order to remove unobservable fixed effects and allow the analysis of the possible existence of discrepancies in firm performance (Lazzarini and Musacchio, 2017; Lins et al. 2017).

Table 14: Scenario Change Summary

	Before – 2006-2015	**After – 2016-2020**
Scenario	Previous Government – State Capitalism	New SOE Law
Hypothesis	SOEs underperform Privatized Companies	SOEs performance improve relative to Privatized Companies

Source: Elaborated by the author

Table 15 shows the results for the DiD models for the previously analyzed variables. During 2016 to 2020, the period underwent the new regulations, SOEs did not present statistically significant differences in performance. Despite improvements in certain SOEs, the changes are insignificant and cannot be attributed to better SOE governance. SOEs continue to underperform compared to privatized companies even under a new regulatory scenario. Previous research on economic changes found mixed results, with performance being impaired when firms are controlled by the government, but with positive results when those firms are based in countries with stronger regulatory institutions (Beuselinck, 2017; Lazzarini and Musacchio, 2018). DiD models were also performed without the control variables, but the significance levels did not change much from the results presented in Table 14. The alternative models are presented in Appendix 2. For the Brazilian case, the conclusion is that SOEs underperform privatized companies in any scenario and under any government orientation. Only privatization can actually result in significant and meaningful performance improvements.

Table 15 – Difference-in-difference estimates

This table presents the DiD results comparing the performance of SOEs before and after the 2016 law change. NewSOEsLaw refers to the years 2016-2020 within the total period analyzed from 2006 to 2020. Although some coefficients were positive, as expected, it was not statistically significant. The values in parentheses are robust standard error. The explanatory variables were GOV, a dummy 1 if the company was state-controlled or 0 otherwise, SIZE, the log of total assets measured in R$ millions, LEV, the ratio of total debt to total assets, CAPEX, the ratio of capital expenditure to total assets, and GDP growth.

	ROA	ROE	OP	SEf	AEf	MTB	ESG
GOV	-4,8725	-10.4838*	-16,8512	-0,9859	-1,7473	-1.4520***	-5,9782
	(-5.8536)	(-5.8808)	(-17.0917)	(-1.4245)	(-3.403)	(-0.4093)	(-6.3244)
SIZE	-0,0001	-0,0001	-0,0001	-0,0000	-0,0001	-0,0001	0,0001
	(-0.0001)	(-0.0001)	(-0.0002)	(-0.0000)	(-0.0001)	(-0.0001)	(-0.0001)
LEV	-11,339	6,4827	-14,2256	0,303	-2,5275	4,4136	-9,1188
	(-43.3253)	(-54.953)	(-42.7185)	(-1.7892)	(-7.6708)	(-17.4498)	(-10.4249)
CAPEX	0,3525	0,8446	0,2735	-0,003	-0,2836	0,0332	-0,2596
	(-0.5323)	(-0.8649)	(-1.621)	(-0.1052)	(-0.8117)	(-0.2108)	(-0.3107)
GDP	0,2749	1.0024***	0,5759	-0,0277	0,0362	0,1121	-0,2717
	(-0.2311)	(-0.3469)	(-0.409)	(-0.0439)	(-0.4239)	(-0.4458)	(-0.355)
NewSOEsLaw	-0,1688	3,792	5,6029	1,2051	5,5208	1,2474	0,4704
	(-3.3216)	(-12.3613)	(-5.4474)	(-0.9479)	(-13.2628)	(-8.0274)	(-4.3323)
NewSOEsLaw *GOV	3,5085	7,5616	4,4886	-0,7299	-3,9227	-0,6173	9,678
	(-3.6944)	(-14.2316)	(-15.6554)	(-1.0919)	(-11.4218)	(-6.4329)	(-7.3731)
Constant	10,9531	5,5303	33,2182	2.0297**	7,9382	-0,6052	52.8528***
	(-22.213)	(-26.8698)	(-46.7145)	(-1.0048)	(-12.1583)	(-11.682)	(-8.2199)
Observations	466	459	466	464	464	409	299
R2	0,3102	0,1512	0,1515	0,2193	0,1559	0,1944	0,1768
Adjusted R2	0,2997	0,138	0,1386	0,2073	0,143	0,1803	0,157

Note: *p<0.1; **p<0.05; ***p<0.01

Source: estimation results.

Table 16 – Difference-in-difference estimates without control variables

This table presents the DiD results comparing the performance of SOEs before and after the 2016 law change. NewSOEsLaw refers to the years 2016-2020 within the total period analyzed from 2006 to 2020. Although some coefficients were positive, as expected, it was not statistically significant. The values in parentheses are robust standard error. The explanatory variables were GOV, a dummy 1 if the company was state controlled or 0 otherwise.

	ROA	ROE	OP	SEf	AEf	MTB	ESG
GOV	-3,0527	-9,1569	-10,4332	-1,001	-1,2755	-1,5532	-4,0408
	(-3.0282)	(-8.6724)	(-16.3551)	(-1.7951)	(-3.7232)	(-1.9579)	(-16.2824)
NEWSOELAW	-2.6013***	-4.1655*	-2,5834	0,979	2,7752	0,3122	5,834
	(-0.9715)	(-2.2283)	(-2.961)	(-1.0422)	(-3.5898)	(-1.0847)	(-5.1774)
NEWSOELAW*Gov	2,785	5,2134	6,7032	-0,3375	-0,9363	-0,192	-1,5267
	(-2.045)	(-4.3172)	(-11.5069)	(-1.0699)	(-3.7523)	(-1.0853)	(-11.1206)
Constant	7.6580***	19.3779**	25.9201***	1,7773	3,3965	2,3663	35.9224**
	(-2.6967)	(-7.7891)	(-9.4342)	(-1.7816)	(-3.5308)	(-1.9572)	(-14.0015)
Observations	321	321	321	321	321	321	321
R2	0,0965	0,1056	0,0666	0,2001	0,1696	0,2109	0,0211
Adjusted R2	0,0879	0,0971	0,0577	0,1925	0,1618	0,2034	0,0119

Note: *p<0.1;
**p<0.05; ***p<0.01
Source: estimation results.

7. CONCLUSIONS

The rise and fall of state capitalism in Brazil have reopened the debate on privatization, a highly polarized topic in the country. The use of SOEs to promote growth during the 2010s led to corruption scandals related to SOEs' ill-managed investments and poor results for shareholders. However, the country still appears to be divided on privatization. More recently, the COVID-19 pandemic has also put privatization back in the public eye. There is increased support for a resilient and robust public sector that focuses on basic social concerns, such as public health and welfare. Additionally, the increase in government debt during the pandemic will again put pressure on politicians to act fiscally responsible and the sale of assets, such as SOEs, will be an option to reduce government debt, with isolated cases already observed at government state level. In the current context, this study provides a relevant contribution to the debate, presenting new information on the performance of Brazilian SOEs during the past 15 years.

This study investigated the relationship between state ownership and firm performance. Previous literature on global SOEs documented heterogenous firm-level performance and significant improvements in companies' results following their privatizations and after being released from political influence in how they were managed. Panel regressions were performed using Brazilian publicly listed state-owned and privatized companies for 2006 to 2020, employing variables related to financial performance, labor efficiency, market valuation and ESG scores. In line with findings documented in international literature, the results in the Brazilian case showed that SOEs underperform privatized peers in all measures, except ESG (Boardman and Vining, 1989; Boubakri and Cosset, 1998; Schleifer, 1998; Dewenter and Malatesta, 2001; Megginson, 2001; Djankov and Murrel, 2002; D'Souza et al., 2005; Gupta, 2005; Megginson et al., 2004; Estrin et al., 2016; Bachiller, 2017; D'Souza and Nash, 2017; Boubakri et al., 2018; Lazzarini and Musacchio, 2018). Specifically, government control has a significantly negative impact on companies' profitability, efficiency, and market values. The results are statically significant even after controlling for potential endogeneity using dynamic econometric models, such as system GMM with external IVs. The negative ownership performance relationship can be attributed to the ingrained political policies that abuse state resources and show no constraints, particularly in over employment. The "grabbing hands" (Schleifer and Vishny, 1998) of the state are detrimental to SOEs' performance, as political management can exert influence and detract companies from pursuing financial objectives such

as generating profits to their shareholders. A discussion on the benefits and costs of state ownership can influence profitability because most of the differences in performance in international research was found to be linked to political interventions and mismanagements.

This study focused on the aggregate impact of SOEs, and not on their individual performances. The results shed new light on the issue whether government participation in corporations is worthy as an economic public policy, and the answer is no. Privatized entities prove that companies are better managed, generate higher profits, invest more, and ultimately employ more people as they expand. Therefore, the privatization debate in Brazil can be enlightened with relevant information for policy makers. For investors, it is clear that the SOEs in Brazil underperform, and that fact is reflected in recurrent discounted market valuations despite the economic cycle or government orientation.

The global COVID-19 pandemic crisis has unquestionably brought back “the return of the state”. However, the issue analyzed and discussed throughout this research is not about a general opposition of market versus state. State intervention in health care, in addition to current subjects of welfare and even global warming, are not at stake here. But rather, the nature of state intervention in the economy. As shown in the empirical results presented here, as a controller and manager of companies, even in regulated sectors, the state is not efficient. The state can thus save resources for other pressing demands from society. Privatization is still the best option for companies to thrive in sectors such as utilities, energy, transportation, and telecom. There should be no controversy, in the Brazilian case, that the privatization program should continue to be promoted and encouraged. The aggregated benefits of privatization are more efficient firms in the economy, that will be more capable to invest and expand, attract capital at lower equity premium, and will be free from political influence that distorts the purpose of businesses.

8. REFERENCES

Acemoglu, D., Moscona, J., & Robinson, J. A. 2016. State capacity and American technology: Evidence from the nineteenth century. The American Economic Review, 106(5), 61–67.

Aguilera, R., Duran, P., Heugens, P., Sauerwald, S., Turturea, R., VanEssen, M. 2021. State ownership, political ideology, and firm performance around the world. Journal of World Business 56 (1), 101113.

Angrist, J.D., Pishke, J.S. 2008. Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press, Princeton, NJ.

Arellano, M., O Bover, O. 1995. Another Look at the Instrumental Variable Estimation of Error Components Models. Journal of Econometric. 68, 29-51.

Arellano, M. and Bond, S. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The Review of Economic Studies 58 (2) 277-297

Bachiller, P. 2017. A meta-analysis of the impact of privatization on firm performance. 2017. Management Decision. 55 (1), 178-202.

Bartel, A., and A. Harrison. 2005. Ownership versus Environment: Disentangling the Sources of Public-Sector Inefficiency. The Review of Economics and Statistics 87 (1), 135–47.

Barry, T. A., Lepetit, L., Tarazi, A. 2011. Ownership structure and risk in publicly held and privately owned banks. Journal of Banking and Finance. 35 (5) 1327-1340.

Ben-Nars, H and Cosset, J. 2014. State Ownership, Political Institutions and Stock Price Informativeness: Evidence from Privatization. Journal of Corporate Finance. 29 179-199.

Bennett, J., Estrin, S., Urga. G. 2007. Methods of privatization and economic growth in transition economies. Economics of Transition. 15 (4) 661-683.

Besley, T., Ghatak, M. 2001. Government Versus Private Ownership of Public Goods. The Quarterly Journal of Economics, 116, (4) 1343–1372.

Berkman, H., R. A. Cole, and L. J. Fu. 2010. Political connections and minority-shareholder protection: Evidence from Securities-Market regulation in China. Journal of Financial and Quantitative Analysis. 45, 1391–1417.

Berkman, H., Cole, R. Fu, L. 2012. Improving corporate governance where the state is the controlling block holder: Evidence from China. European Journal of Finance. 20 (7-9), 752-777.

Bertoni, F., Lugo, S. 2014. The effect of sovereign wealth funds on the credit risk of their portfolio companies. Journal of Corporate Finance. 27, 21–35.

Beuselinck, C., L. Cao, M. Deloof, and X. Xia. 2017. The value of government ownership during the global financial crisis. Journal of Corporate Finance. 42, 481–493.

Boardman, A., Vinning, A. 1989. Ownership and Performance in Competitive Environments: A Comparison of the Performance of Private, Mixed, and State-Owned Enterprises. The Journal of Law and Economics. 32(1), 1-33.

Boardman, A., Vinning, A., Weimr, D. 2016. The long-run effects of privatization on productivity: Evidence from Canada. Journal of Policy Modeling 38, 1001–1017.

Boletim das Empresas Estatais Federais. 2019. Ministério da Economia, Secretaria Especial de Desestatização, Desinvestimento e Mercados, Secretaria de Coordenação e Governança das Empresas Estatais. Vol. 13 (out./dez.2019).

Borisova, G., Megginson, W., 2011. Does government ownership affect the cost of debt? Evidence from privatization. Review of Financial Studies 24 (8), 2693–2737.

Borisova, G., Brockman, P., Salas, J., Zagorchev, A. 2012. Government ownership and corporate governance: Evidence from the EU. Journal of Banking & Finance. 36 (11), 2917–2934.

Borisova, G., Fotak, C. Holland, K., Megginson, W. 2015. Government ownership and cost of debt: Evidence from government investments in publicly traded firms. Journal of Financial Economics. 118 (1), 168-191.

Borisova, G. and P. Yadav. 2015. Government ownership, informed trading, and private information. Journal of Corporate Finance. 33, 195–211.

Borisova, G., Salas, J., Zagorchev, A. 2019. CEO compensation and government ownership. Corporate Governance: An International Review 27 (2), 120-143.

Bortolotti, B., Fantini, M. and Siniscalco, D. 2004. Privatisation around the world: evidence from panel data, Journal of Public Economics, Vol. 88 Nos 1-2, pp. 305-332.

Bortolotti, B. and M. Faccio. 2009. Government control of privatized firms. Review of Financial Studies. 22: 2907–2939.

Bortolotti, B., V. Fotak, and W. Megginson. 2015. The sovereign wealth fund discount: Evidence from public equity investments". The Review of Financial Studies. 28, 2993–3035.

Bortolotti, B., Jong, F., Nicodano, G., Schindele, I. 2007. Privatization and stock market liquidity. Journal of Banking and Finance. 31 (2), 297-316.

Boubakri, N., Cosset, J. 1998. Political connections of newly privatized firms. The Journal of Finance 53 (3), 1081-1110.

Boubakri, N., Cosset, J., Guedhami, O., 2005. Post privatization corporate governance: the role of ownership structure and investor protection. Journal of Financial Economics 76, 369–399.

Boubakri, N., Cosset, J., Guedhami O. 2005. Liberalization, corporate governance and the performance of privatized firms in developing countries. Journal of Corporate Finance 11 (5), 767-790.

Boubakri, N., Cosset, J., Saffar, W. 2008. The financial and operating performance of newly privatized firms: Evidence from developing countries. Journal of corporate finance 14 (5), 654-673.

Boubakri, N., Cosset, J., Guedhami O. 2008. From state to private ownership: Issues from strategic industries. Journal of Banking and Finance 33, 367-379.

Boubakri, N., J.-C. Cosset, O. Guedhami, and W. Saffar. 2011. The political economy of residual state ownership in privatized firms: Evidence from emerging markets. Journal of Corporate Finance. 17, 244–258.

Boubakri, N., Guedhami, O., Mishra, D., and Saffar, . W. 2012. Political connections and the cost of equity capital. Journal of Corporate Finance. 18, 541–559.

Boubakri, N., Cosset, J., Saffar, W., 2013. The role of state and foreign owners in corporate risk-taking: evidence from privatization. Journal of Financial Economics 108, 641–658.

Boubakri, N., Cosset, J., Saffar, W. 2017. The constraints on full privatization: International evidence. Journal of Corporate Finance 42, 392-407.

Boubakri, N., Ghoul, S., Guedhami, O., Megginson, W. 2018. The market value of government ownership. Journal of Corporate Finance, 50, 44–65.

Boubakri, N., Guedhami, O., Kwok, C., Wang, H. 2019. Is privatization a socially responsible reform? Journal of Corporate Finance, 56 129-151.

Boubakri, N., Saffar, W. 2019. State Ownership and Debt Choice: Evidence from Privatization. Journal of Financial and Quantitative Analysis, 54 (3), 1313-1346.

Boubakri, Chen, R., Ghoul, S., Guedhami, O., Nash, R. 2020. State ownership and stock liquidity: evidence from privatization. Journal of Corporate Finance, 65 101763.

Boycko, M., Shleifer, A., Vishny, W. 1996. A Theory of Privatization. The Economic Journal, 106, 309-319.

Brown, D., Earle, J., Telegdy, A. 2006. The Productivity Effects of Privatization: Longitudinal Estimates from Hungary, Romania, Russia, and Ukraine. Journal of Political Economy 114 (1), 61-99.

Chen, G., Firth, M., and Xu, L. 2008. Control transfers, privatization, and corporate performance: Efficiency gains in China's listed companies. Journal of Financial and Quantitative Analysis, 43: 161–190.

Chen, G., Firth, M., Xu, L., 2009. Does the type of ownership control matter? Evidence from China's listed companies. Journal of Banking and Finance 33, 171–181.

Chen, K., Chen, Z.-H., Wei, K., 2011. Agency costs of free cash flow and the effect of shareholder rights on the implied cost of equity capital. Journal of Financial Quantitative Analysis, 46, 171–207.

Chen, R., El Ghoul, S., Guedhami, O., Wang, H., 2017. Do state and foreign ownership affect investment efficiency? Evidence from privatizations. Journal of Corporate Finance 42, 408–421.

Chen, S., Chen, M., Wei, H., 2017. Financial performance of Chinese airlines: Does state ownership matter? Journal of Hospitality and Tourism Management, 33, 1-10.

Chen, R., El Ghoul, S., Guedhami, O., Nash, R., 2018. State ownership and corporate cash holdings. Journal of Financial Quantitative Analysis, 53, 2293–2334.

Chen, Y., Hung, M., & Wang, Y. 2018. The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China. Journal of Accounting and Economics, 65(1), 169-190.

Chen, R., El Ghoul, S., Guedhami, O. 2021. International evidence on state ownership and trade credit: Opportunities and motivations. J Int Bus Stud 52, 1121–1158.

Chong, A., J. Guillen, and F. López-de-Silanes. 2011. Privatization and labor policies. Journal of Public Economics, 95, 1119–1130.

Coase, R. 1974. The Lighthouse in Economics. Journal of Law and Economics, 17, 357-376.

Cooper, M. J., Gulen H., and Ovtchinnikov, A. 2010. Corporate political contributions and stock returns. Journal of Finance, 65: 687–724.

Cosset, J. C., some, H., Valery, P. 2016. Credible Reforms and stock return volatility. Evidence form Privatization. Journal of Banking Finance. 72 99-120.

Cuervo-Cazurra, A., Grosman, A., & Megginson, W. L. 2022. A review of the internationalization of state-owned firms and sovereign wealth funds: Governments nonbusiness objectives and discreet power. Journal of International Business Studies.

D'Souza, J., Megginson, W. 1999. The Financial and Operating Performance of Privatized Firms during the 1990s. Journal of Finance, 54, 1397-1438.

D'Souza, J., Megginson, W. and Nash, R. 2005. Effect of institutional and firm-specific characteristics on post-privatization performance: evidence from developed countries. Journal of Corporate Finance, 11 (5), 747-766.

D'Souza, Nash, R. 2017. Private benefits of public control: Evidence of political and economic benefits of state ownership. Journal of Corporate Finance, 46, 232-247.

Demsetz, H. 1983. The Structure of Ownership and the Theory of the Firm. Journal of Law and Economics, 26, (2) 375-90.

Demsetz, H. and Villalonga, B. 2001. Ownership Structure and Corporate Finance. Journal of Corporate Finance 7 209-233.

Dewenter, K., Malatesta, P. 1997. Public offerings of state-owned and privately-owned enterprises, an international comparison. The Journal of Finance 52 (4) 1659-1679.

Dewenter, K., and Malatesta, P. 2001. State-owned and privately-owned firms: an empirical analysis of profitability, leverage, and labor intensity. The American Economic Review 91 (1), 320-334.

Dewenter, K. L., X. Han, and P. H. Malatesta. 2010. Firm value and sovereign wealth fund investments. Journal of Financial Economics. 98 (2), 256–278.

Dinc, S. and Gupta, N. 2011. The decision to privatize: finance and politics. Journal of Finance. 66 (1), 241–269.

Djankov, S. and Murrell, P. 2002 Enterprise Restructuring in Transition: A Quantitative Survey Journal of Economic Literature 40 (3) 739-792.

Duchin, R. and D. Sosyura. 2012. The politics of government investment. Journal of Financial Economics. 106, 24–48.

Dyck, A., 2001. Privatization and corporate governance: principles, evidence, and future challenges. World Bank Res. Obs. 16, 59–84.

Dyck, A., Zingales, L. 2004. Private benefits of control: An international comparison. The journal of finance 59 (2), 537-600.

Dyck, A., 2019. Do institutional investors drive corporate social responsibility? International evidence. Journal of Financial Economics, 131 3 693-714.

Estrin, S., J. Hanousek, E. Koocenda, and J. Svejnar. 2009. The effects of privatization and ownership in transition economies. Journal of Economic Literature. 47 (3) 699–728.

Estrin, S. and Pelletier, A. 2015. Privatization in developing countries. What are the lessons of experience? Economics, Private Sector Professional Evidence, and Applied Knowledge Series (EPS-PEAKS) Topic Guide.

Estrin, S., Meyer, K., Nielsen, B., Nielsen, S. 2016. Home country institutions and the internationalization of state-owned enterprises: A cross-country analysis. Journal of World Business. 51 (2) 294-307.

Faccio, M., Masulis, R., McConnell, J. 2006. Political connections and corporate bailouts. Journal of Finance. 61, 2597– 2635.

Fan, J., Wong, T., Zhang, T. 2007. Politically connected CEOs, corporate governance, and post-IPO performance of China's newly partially privatized firms. Journal of Financial Economics, 84 (2), 330-357.

Fontes-Filho, J.R. 2020. A governança corporativa em empresas estatais brasileiras frente à Lei de Responsabilidade das Estatais (Lei nº 13.303/2016). Revista do Serviço Público. 22, 437-461.

Goyal, A., Jategaonkar, S., Muckley, C. 2020. Why do privatized firms pay higher dividends? Journal of Corporate Finance. 60 (101493).

Gupta, N. 2005. Partial privatization and firm performance. Journal of Finance. 60 (2), 987–1015.

Gupta, S., Schiller, C., Ma, H., Tiongson, E. 2001. Privatization, labor, and social safety nets. Journal of Economic Surveys. 15 (5), 647–69.

Hart, O., Shleifer, A., Vishny, R. 1997. The proper scope of government. The Quarterly Journal of Economics. 112 (4), 1127-1161.

Jensen, M., Meckling, W. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics. 3 (4), 305-360.

Kornai, J., Maskin, E. and Roland, G. 2003. Understanding the Soft Budget Constraint. Journal of Economic Literature. 41(4):1095-1136.

La Porta, R., Lopez de Silanes, F., Shleifer, A., Vishny, R. 1998. Law and Finance. Journal of Political Economy, 106 (6), 1113-1155.

La Porta, R., Lopez-de-Silanes, F. 1999. Benefits of Privatization-Evidence from Mexico. Quarterly Journal of Economics 114 (4), 1193–242.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. 1999. Corporate ownership around the world. Journal of Finance, 54, 471–518.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. 2000. Investor protection and corporate governance, Journal of Financial Economics, 58, 3-27.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. 2002. Government ownership of banks. The Journal of Finance, 57 (1) 265-301.

Lattanzio, G., Megginson, W. L., 2021. Can restructuring gains be sustained without ownership changes? Evidence from withdrawn privatizations. Journal of Financial and Quantitative Analysis, 56 (4) 1476-1504.

Lazzarini, S. 2018. Capitalismo de Laços: os Donos do Brasil e Suas Conexões. 2 ed. São Paulo. BEI Comunicção.

Lazzarini, S., Musacchio, A. 2013. Leviathan as a Minority Shareholder: Firm-Level Implications of State Equity Purchases. Academy of Management Journal, 56 (6), 1775–1801.

Lazzarini, S., Musacchio, A. 2014. Reinventing state capitalism. Harvard University Press

Lazzarini, S., Musacchio, A. 2018. State ownership reinvented? Explaining performance differences between state-owned and private firms. Corporate Governance International Review. 26 (4), 255–272.

Li, B., Megginson, W., Shen, Z., Sun, Q. 2019. Privatization Effect versus Listing Effect: Evidence from China. SSRN 3293435.

Li, B., Megginson, W., Shen, Z., Sun. 2015. Do Share Issue Privatizations Really Improve Firm Performance in China? SSRN 2645514

Liberman, I., Fergusson, R. 1998. Overview of privatization in emerging markets. The World Bank, Washington D.C.

Lin, C., Ma, Y., Malatesta, P., Xuan, Y. 2013. Corporate ownership structure and the choice between bank debt and public debt. Journal of Financial Economics. 109, 517–534.

Lin, C., Su, D., 2008. Industrial diversification, partial privatization and firm valuation: evidence from publicly listed firms in China. Journal of Corporate Finance. 14, 405–417.

Lins, K. 2003. Equity ownership and firm value in emerging markets. Journal of Financial and Quantitative Analysis, 38, 159-184.

Lins, K. V., Servaes, H. Tamayo, A. 2017. Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis. The Journal of Finance, 72, (4), 1785-1824.

Lopez-de-Silanes, F. 1997. Determinants of Privatization Prices. The Quarterly Journal of Economics. 112 (4), 965–1025.

Lopez-de-Silanes, F. 2005. Dos and Don'ts in Privatization: Evidence from Less Developed Countries. Privatization Barometer Newsletter. 2, 29–35.

Megginson, W., Nash, R., Randenborgh, M. 1994. The Financial and Operating Performance of Newly Privatized Firms: An International Empirical Analysis. Journal of Finance. 49 (2), 403-452.

Megginson, W. and J. M. Netter. 2001. From state to market: a survey of empirical studies on privatization. Journal of Economic Literature. 39 (2) 321–389.

Megginson, W., Nash, R., Netter, J., Paulsen, A. 2004. The Choice of Private Versus Public Capital Markets: Evidence from Privatizations. Journal of Finance 59 (6), 2835-2870.

Megginson, W. 2005. The Financial Economics of Privatization. New York: Oxford University Press.

Megginson, W. 2010. Privatization and finance. Annual Review of Financial Economics. 2(6): 6.1–6.30.

Megginson, W. and Fotak, V. 2015. Rise of the fiduciary state: A survey of sovereign wealth fund research. Journal of Economic Surveys. 29: 733–778.

Megginson, W., Ullah, B., and Wei, Z. 2014. State ownership, soft budget constraints, and cash holdings: Evidence from China's privatized firms. Journal of Banking and Finance, 48, 276–291.

Megginson, W. 2017. State capitalism and state ownership of business in the 21st century. SSRN 3094412.

Meynhardt, T. 2009. Public Value Inside: What is Public Value Creation? International Journal of Public Administration, 32 (3), 192-219.

Musacchio, A., Lazzarini, S. 2012. Leviathan in business: Varieties of state capitalism and their implications for economic performance. Available at SSRN 2070942.

Ng, A., Yuce, A., Chen, E. 2009. Determinants of state equity ownership, and its effect on value/performance: China's privatized firms. Pacific-Basin Finance Journal 17, 413–443.

Radic, M., Ravasi, D., & Munir, K. 2021. Privatization: Implications of a Shift from State to Private Ownership. Journal of Management, 47(6), 1596–1629.

Ramamurti, R. 1999. Why haven't developing countries privatized deeper and faster?, World Development, 27, (1) 137-155.

Ruggiero, P., Sorrentino, D. & Mussari. 2021. Earnings management in state-owned enterprises: bringing publicness back in. Journal of Management and Governance.

Samuelson, P. A. 1954. The Pure Theory of Public Expenditure. *The Review of Economics and Statistics*, *36*(4), 387–389.

Schiozer, R., Murad, F., Martins, T. 2021. A Tutorial on the Use of Differences-in-Differences in Management, Finance, and Accounting. Revista de Adminsitração Contemporanea. 25 (1).

Shleifer, A., Vishny, R. W. 1994. Politicians and firms. Quarterly Journal of Economics, 109, 995– 1025.

Shleifer, A. 1998. State versus private ownership. Journal of Economic Perspectives. 12: 133–150.

Santos, J. 2016. Privatization prices: The role of prior restructuring and emerging private ownership structure. Working paper, University of Madeira, Portugal.

The Economist. 2012. Special report: State capitalism (Vol. 1–18). London, UK: The Economist.

Tian, L., Estrin, S. 2008. Retained state shareholding in Chinese PLCs: Does government ownership always reduce corporate value? Journal of Comparative Economics 36, 74–89.

Wang, G., Knox, K., Lee, P., 2013. A study of relative efficiency between privatised and publicly operated US ports. Maritime Policy & Management Journal. 40:4, 351-366.

Wang, X., Wu, W., Zhoud, S. 2019. Trade credit, ownership and informal financing in China. Pacific-Basin Finance Journal. 57, 101177.

Wolf, C. 2009. Does ownership matter? The performance and efficiency of state oil vs. private oil. Energy Policy. 37, 2642– 2652.

WIR (2017), World Investment Report: Investment and the Digital Economy, United Nations Publication, New York, NY; and Geneva.

Villalonga, B. 2000. Privatization and efficiency, differentiating ownership effects from political, organizational, and dynamic effects. Journal of Economic Behavior and Organization, 42 (1) 43-74.

Villalonga, B., and Amit, R. 2006. How Do Family Ownership, Control and Management Affect Firm Value? Journal of Financial Economics, 80 (2), 385-417.

Vining, A., Boardman, A. 1992. Ownership versus competition: Efficiency in public enterprise. Public Choice 73: 205-239, 1992.

Vining, A. and Weimer, D. 2016. The challenges of fractionalized property rights in public-private hybrid organizations: The good, the bad, and the ugly. Regulation & Governance, 10, 161–178.

Vitoria, R., Bressan, A., Iquiapaza, R. 2020. Do State-owned Enterprises in Brazil Require a Risk Premium Factor? Brazilian Business Review, 17, 488-505.

Young, M., Peng, M., Ahlstrom, D., Bruton, G. and Jiang, Y. 2008. Corporate Governance in Emerging Economies: A Review of the Principal–Principal Perspective. Journal of Management Studies, 45 196-220.

Zingales, L. 1994. The value of the voting right: A study of the Milan stock exchange experience. The Review of Financial Studies, 7 (1), 125-148.

Appendix 1 – Complete Panel Regression Results and Tests

Table 17 – Shapiro and F-Test

	Shapiro - SOE	Shapiro - Privatized	F-Test
Profitability			
ROE	0.9125***	0.7678***	0.405***
ROA	0.7937***	0.9546***	1.3016*
OP	0.8712***	0.9102***	1,0709
DY	0.5483***	0.3210***	0.1878***
Efficiency			
SEf	0.8704***	0.8572***	0.242***
AEf	0.6782***	0.6166***	0.2439***
Valuation			
MTB	0.5891***	0.4180***	0.0621***
ESG			
ESG	0.9578***	0.9835*	1,0484
Others			
NP	0.8288***	0.8784***	1.3973*
LEV	0.7067***	0.9213***	1.5522***
CAPEX	0.9622***	0.9020***	0.5676***
DEBT	0.6008***	0.6783***	2.6553***
CASH	0.5275***	0.7827***	3.3717***
SIZE	0.5732***	0.6943***	4.4096***
LIABILITY	0.5557***	0.7236***	4.7484***
EQUITY	0.5948***	0.5079***	2.6018***
REVENUE	0.7776***	0.7853***	0,9632
MKTCAP	0.7343***	0.7566***	0.647***
DIVIDEND	0.4954***	0.5927***	0.2858***
EMPLOYEES	0.8634***	0.7811***	1,1147

This table presents the Shapiro test and F-test for all variables in the sample.

Note: *p<0.1; **p<0.05; ***p<0.01

Table 18 - ROA Regressions Results

	Pooled	Fixed Effect	Time Fixed Effect	Twoways Fixed Effects	Randon Effects
GOV	-4.0160***		-4.0060***		-4.4300***
	(-1.246)		(-1.231)		(-1.499)
SIZE	-0,5434	-1,821	-0,5316	-3.1360*	-1,245
	(-0.54)	(-1.176)	(-0.5309)	(-1.672)	(-0.8188)
LEV	-10.5200**	-12.4000***	-10.7100**	-14.9800***	-12.2700***
	(-4.431)	(-4.542)	(-4.448)	(-4.281)	(-4.422)
CAPEX	0.3428***	-0,0071	0.3334**	-0,0174	0,0702
	(-0.1326)	(-0.143)	(-0.1354)	(-0.1332)	(-0.1284)
GDP	0,1701	0,1193			0.1532**
	(-0.111)	(-0.0752)			(-0.0781)
Constant	15.3700***				24.4300***
	(-5.638)				(-8.084)
Observations	466	466	466	466	466
R2	0,2885	0,1861	0,2682	0,1558	0,1974
Adjusted R2	0,2808	0,1158	0,2388	0,0541	0,1887
F Statistic	37.3100***	24.4700***	40.9600***	25.5200***	115.7000***

Table 19 - ROA Regressions Tests

Lagrange Multiplier Test		Fixed Effect Models Tests		Painel Models Tests		Estatistic Tests of Best Model	
Test	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**
Fixed Effect	20.4522***	Fixed Effect VS Time Fixed Effects	NaN	Pooled vs FE	9.8739***	Durbin-Watson	1.5016***
Time Fixed Effects	1.2013	Fixed Effect VS Twoways Fixed Effect	3.378***	Pooled vs RE	20.4522***	Breusch-Godfrey	40.3204***
Twoways Fixed Effect	15.3114***	Time Fixed Effects VS Twoways Fixed Effect	12.0971***	FE vs RE	70.2792***	Pesran	-1.5171
						Shapiro-Wilk	0.9298***

Table 20 - ROE Regressions Results

	Pooled	Fixed Effect	Time Fixed Effect	Twoways Fixed Effects	Randon Effects
GOV	-8.5290***		-8.5300***		-9.7320***
	(-2.735)		(-2.713)		(-3.279)
SIZE	-0,4343	-0,5459	-0,7809	-2,745	-0,2869
	(-0.9905)	(-2.038)	(-1.171)	(-2.974)	(-1.193)
LEV	9,181	12,98	7,03	5,734	11,18
	(-9.824)	(-20.29)	(-9.088)	(-16.12)	(-15.59)
CAPEX	0.8271***	0,1056	0.8203***	0,0532	0,2914
	(-0.2389)	(-0.2096)	(-0.2592)	(-0.1999)	(-0.1838)
GDP	0.4408*	0.6606***			0.6231***
	(-0.2331)	(-0.2476)			(-0.2182)
Constant	9,813				9,575
	(-9.846)				(-11.8)
Observations	459	459	459	459	459
R2	0,1229	0,0291	0,1167	0,0048	0,0407
Adjusted R2	0,1132	-0,0562	0,0806	-0,1172	0,0301
F Statistic	12.7000***	3.1550**	14.5400***	0,655	22.2500***

Table 21 – ROE Regressions Tests

Lagrange Multiplier Test		Fixed Effect Models Tests		Painel Models Tests		Estatistic Tests of Best Model	
Test	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**
Fixed Effect	17.5232***	Fixed Effect VS Time Fixed Effects	NaN	Pooled vs FE	7.7946***	Durbin-Watson	1.3817***
Time Fixed Effects	2.5639***	Fixed Effect VS Twoways Fixed Effect	3.7509***	Pooled vs RE	17.5232***	Breusch-Godfrey	17.8423**
Twoways Fixed Effect	14.2037***	Time Fixed Effects VS Twoways Fixed Effect	8.9491***	FE vs RE	114.7197***	Pesran	1.9658**
						Shapiro-Wilk	0.7627***

Table 22 - OP Regressions Results

	Pooled	Fixed Effect	Time Fixed Effect	Twoways Fixed Effects	Randon Effects
GOV	-15.9000***		-15.9100***		-18.2500***
	(-5.049)		(-5.073)		(-5.33)
SIZE	-0,0683	-0,6854	-0,4437	-0,6725	-0,6092
	(-2.405)	(-1.709)	(-2.609)	(-3.246)	(-1.421)
LEV	-10,27	-5.8980*	-12,39	-10.1600***	-7.0920*
	(-11.09)	(-3.476)	(-11.83)	(-2.464)	(-4.033)
CAPEX	0,2777	-0,1103	0,2697	-0,1582	-0,0845
	(-0.4701)	(-0.3002)	(-0.4841)	(-0.2746)	(-0.2931)
GDP	-0,0081	0.3532**			0.3218**
	(-0.2678)	(-0.1617)			(-0.1386)
Constant	33,51				39.6200***
	(-28.67)				(-14.23)
Observat	466	466	466	466	466
R2	0,1309	0,0127	0,1358	0,0079	0,042
Adjusted	0,1215	-0,0727	0,101	-0,1117	0,0316
F Statis	13.8600***	1,374	17.5600***	1,097	15.5900***

Table 23 – OP Regressions Tests

Lagrange Multiplier Test		Fixed Effect Models Tests		Painel Models Tests		Estatistic Tests of Best Model	
Test	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**
Fixed Effect	29.0061***	Fixed Effect VS Time Fixed Effects	NaN	Pooled vs FE	15.5446***	Durbin-Watson	1.755***
Time Fixed Effects	-0.3093	Fixed Effect VS Twoways Fixed Effect	2.383***	Pooled vs RE	29.0061***	Breusch-Godfrey	32.4436***
Twoways Fixed Effect	20.2917***	Time Fixed Effects VS Twoways Fixed Effect	20.2019***	FE vs RE	4.7329	Pesran	9.2455***
						Shapiro-Wilk	0.7959***

Table 24 - DY Regressions Results

	Pooled	Fixed Effect	Time Fixed Effect	Twoways Fixed Effects	Randon Effects
GOV	-2,964		-2,997		-2,471
	(-2.172)		(-2.116)		(-2.318)
SIZE	2.4750*	5,081	2.6440*	5,938	3,568
	(-1.472)	(-4.51)	(-1.526)	(-5.954)	(-2.756)
LEV	-14,75	-29,55	-13,43	-27,19	-22,75
	(-9.142)	(-26.14)	(-8.448)	(-25.21)	(-18.49)
CAPEX	-0,2967	0,1579	-0,3139	0,1587	0,038
	(-0.3)	(-0.1192)	(-0.2953)	(-0.1172)	(-0.1096)
GDP	-0,091	-0,1771			-0,2024
	(-0.2012)	(-0.2003)			(-0.2589)
Constant	-4,69				-11,78
	(-7.04)				(-14.63)
Observat	466	466	466	466	466
R2	0,1048	0,0889	0,1046	0,077	0,0862
Adjusted	0,0951	0,0101	0,0686	-0,0342	0,0763
F Statis	10.7700***	10.4400***	13.0600***	11.5400***	42.5400***

Table 25 – DY Regressions Tests

Lagrange Multiplier Test		Fixed Effect Models Tests		Painel Models Tests		Estatistic Tests of Best Model	
Test	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**
Fixed Effect	10.7909***	Fixed Effect VS Time Fixed Effects	NaN	Pooled vs FE	7.0089***	Durbin-Watson	0.989***
Time Fixed Effects	0.9482	Fixed Effect VS Twoways Fixed Effect	1.2676	Pooled vs RE	10.7909***	Breusch-Godfrey	35.6554***
Twoways Fixed Effect	8.3008***	Time Fixed Effects VS Twoways Fixed Effect	6.7028***	FE vs RE	13.1851**	Pesran	6.219***
						Shapiro-Wilk	0.4682***

Table 26 - SEf Regressions Results

	Pooled	Fixed Effect	Time Fixed Effect	Twoways Fixed Effects	Randon Effects
GOV	-1.2820***		-1.2800***		-1.4140***
	(-0.4117)		(-0.4214)		(-0.5464)
SIZE	-0,0181	0.8052***	-0,1618	0,2055	0.7023***
	(-0.1389)	(-0.1655)	(-0.1777)	(-0.1998)	(-0.1465)
LEV	0,5693	0,2018	-0,0274	-0,3848	0,3337
	(-0.6977)	(-0.3868)	(-0.7603)	(-0.3971)	(-0.3784)
CAPEX	-0,0064	-0,0053	0,0078	-0,0014	-0,0073
	(-0.0357)	(-0.0114)	(-0.0358)	(-0.0109)	(-0.0112)
GDP	-0.1105***	-0,0145			-0,0225
	(-0.024)	(-0.0145)			(-0.0139)
Constant	2.6110*				-3.9090***
	(-1.504)				(-1.378)
Observat	464	464	464	464	464
R2	0,1727	0,3109	0,1446	0,0137	0,2888
Adjusted	0,1636	0,251	0,11	-0,1057	0,2811
F Statis	19.1200***	48.0500***	18.8000***	1,913	173.4000***

Table 27 – SEf Regressions Tests

Lagrange Multiplier Test		Fixed Effect Models Tests		Painel Models Tests		Estatistic Tests of Best Model	
Test	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**
Fixed Effect	40.6252***	Fixed Effect VS Time Fixed Effects	NaN	Pooled vs FE	84.9351***	Durbin-Watson	0.7385***
Time Fixed Effects	2.7971***	Fixed Effect VS Twoways Fixed Effect	4.5146***	Pooled vs RE	40.6252***	Breusch-Godfrey	96.6266***
Twoways Fixed Effect	30.7042***	Time Fixed Effects VS Twoways Fixed Effect	103.4335***	FE vs RE	28.6051***	Pesran	0.9563
						Shapiro-Wilk	0.9168***

Table 28 - AEf Regressions Results

	Pooled	Fixed Effect	Time Fixed Effect	Twoways Fixed Effects	Randon Effects
GOV	-3.2320*		-3.2300*		-4.6330*
	(-1.672)		(-1.705)		(-2.77)
SIZE	-0,0346	2.6050***	-0,5586	1.6260*	2.3630***
	(-0.5875)	(-0.608)	(-0.819)	(-0.8999)	(-0.5198)
LEV	-1,581	1,378	-3,812	-0,0823	1,448
	(-2.721)	(-1.091)	(-3.068)	(-1.352)	(-1.176)
CAPEX	-0.3035*	-0,0367	-0,2632	-0,0346	-0,049
	(-0.1736)	(-0.0457)	(-0.1677)	(-0.0406)	(-0.0455)
GDP	-0.3304***	0,0302			0,0098
	(-0.0916)	(-0.0641)			(-0.0575)
Constant	10,47				-13.9300***
	(-6.995)				(-4.505)
Observat	464	464	464	464	464
R2	0,0995	0,2768	0,0793	0,0484	0,2446
Adjusted	0,0896	0,2139	0,0421	-0,0668	0,2364
F Statis	10.1200***	40.7500***	9.5870***	7.0020***	134.7000***

Table 29 – AEf Regressions Tests

Lagrange Multiplier Test		Fixed Effect Models Tests		Painel Models Tests		Estatistic Tests of Best Model	
Test	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**
Fixed Effect	29.9239***	Fixed Effect VS Time Fixed Effects	NaN	Pooled vs FE	116.4967***	Durbin-Watson	1.0867***
Time Fixed Effects	2.8205***	Fixed Effect VS Twoways Fixed Effect	2.2032**	Pooled vs RE	29.9239***	Breusch-Godfrey	215.1943***
Twoways Fixed Effect	23.1538***	Time Fixed Effects VS Twoways Fixed Effect	144.7843***	FE vs RE	1.1989	Pesran	3.9456***
						Shapiro-Wilk	0.7012***

Table 30 - MTB Regressions Results

	Pooled	Fixed Effect	Time Fixed Effect	Twoways Fixed Effects	Randon Effects
GOV	-1.6190***		-1.6040***		-1.3370***
	(-0.4152)		(-0.4042)		(-0.4598)
SIZE	-0,0634	0,1726	-0,1625	-0,4993	0,0593
	(-0.1268)	(-0.3309)	(-0.1358)	(-0.4447)	(-0.1873)
LEV	4.8450**	9,212	4.3740**	8,051	7.1200*
	(-2.095)	(-6.249)	(-1.807)	(-5.476)	(-3.995)
CAPEX	0,0302	0,0383	0,0364	0,0381	0,0294
	(-0.0438)	(-0.0392)	(-0.0479)	(-0.04)	(-0.0327)
GDP	0,0148	0.0514**			0.0380**
	(-0.0281)	(-0.0241)			(-0.0183)
Constant	0,3523				-2,288
	(-1.521)				(-3.543)
Observat	417	417	417	417	417
R2	0,1715	0,0963	0,1665	0,0736	0,1054
Adjusted	0,1615	0,0107	0,1288	-0,05	0,0945
F Statis	17.0200***	10.1200***	19.8700***	9.7260***	47.5400***

Table 31 – MTB Regressions Tests

Lagrange Multiplier Test		Fixed Effect Models Tests		Painel Models Tests		Estatistic Tests of Best Model	
Test	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**
Fixed Effect	12.4693***	Fixed Effect VS Time Fixed Effects	NaN	Pooled vs FE	6.1744***	Durbin-Watson	1.046***
Time Fixed Effects	0.5998	Fixed Effect VS Twoways Fixed Effect	1.6587*	Pooled vs RE	12.4693***	Breusch-Godfrey	8.226
Twoways Fixed Effect	9.2413***	Time Fixed Effects VS Twoways Fixed Effect	6.0696***	FE vs RE	8.9764*	Pesran	8.418***
						Shapiro-Wilk	0.4623***

Table 32 - ESG Regressions Results

	Pooled	Fixed Effect	Time Fixed Effect	Twoways Fixed Effects	Randon Effects
GOV	-3,067		-2,661		-1,721
	(-2.899)		(-2.871)		(-3.191)
SIZE	4.4770***	6.9160***	3.6360***	0,0154	6.2160***
	(-1.088)	(-2.576)	(-1.172)	(-1.648)	(-1.645)
LEV	-6,104	3,587	-7,879	2,054	0,9501
	(-6.026)	(-9.958)	(-6.046)	(-10.93)	(-7.51)
CAPEX	-0,0545	0,1729	-0,0764	0.2451*	0,1513
	(-0.219)	(-0.1839)	(-0.2248)	(-0.141)	(-0.1711)
GDP	-0.4683*	-0.6220***			-0.6284***
	(-0.2838)	(-0.2015)			(-0.2098)
Constant	8,831				-14,1
	(-11.89)				(-17.19)
Observat	293	293	293	293	293
R2	0,1916	0,2347	0,124	0,0102	0,2117
Adjusted	0,1775	0,1535	0,0665	-0,1515	0,198
F Statis	13.6000***	20.2400***	9.6980***	0,8635	79.5600***

Table 33 – ESG Regressions Tests

Lagrange Multiplier Test		Fixed Effect Models Tests		Painel Models Tests		Estatistic Tests of Best Model	
Test	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**	**Test**	**Estatistic**
Fixed Effect	12.4693***	Fixed Effect VS Time Fixed Effects	NaN	Pooled vs FE	5.0162***	Durbin-Watson	1.062***
Time Fixed Effects	0.5998	Fixed Effect VS Twoways Fixed Effect	1.6587*	Pooled vs RE	12.4693***	Breusch-Godfrey	8.226
Twoways Fixed Effect	9.2413***	Time Fixed Effects VS Twoways Fixed Effect	6.0696***	FE vs RE	3.3913	Pesran	13.9974***
						Shapiro-Wilk	0.488***

Appendix 2 – DiD Robustness Checks Results

Table 34 – DiD Results with Balanced Panel

	ROA	ROE	OP	DY	SEf	AEf	MTB	ESG
GOV	-3,1825	-8,8419	-10,7322	-1,9903	-1,0175	-1,4239	-1,3982	-7,5743
	(-3.1522)	(-8.177)	(-19.9848)	(-4.5218)	(-1.9356)	(-4.3356)	(-2.3722)	(-13.9266)
SIZE	-0,5683	-0,2173	1,2493	0,9523	0,1392	0,7738	-0,0073	9,7016
	(-1.4588)	(-2.5686)	(-12.9904)	(-1.0043)	(-0.2313)	(-0.992)	(-0.123)	(-6.7288)
LEV	-4,0485	10,2221	2,9475	-10,1561	0,9641	1,0954	2,8375	-18,8492
	(-5.3959)	(-24.476)	(-61.0925)	(-9.7978)	(-4.1817)	(-8.0077)	(-7.975)	(-24.5341)
CAPEX	0,1359	0,3765	0,235	-0,0593	0,0402	0,0111	-0,0265	0,2326
	(-0.2901)	(-0.3104)	(-2.326)	(-0.3713)	(-0.0662)	(-0.1396)	(-0.2514)	(-0.7253)
GDP	0,2206	0.5826**	0,6772	-0,1152	-0,0278	0,0049	0,038	-1.7059***
	(-0.1945)	(-0.25)	(-0.4273)	(-0.2295)	(-0.0654)	(-0.0673)	(-0.0363)	(-0.5874)
NEWSOELAW	-0,7085	-1,388	-0,6053	-2,4727	0,7247	2,0183	0,3182	-9,8512
	(-0.9817)	(-3.4838)	(-19.3159)	(-2.2886)	(-0.8073)	(-3.5098)	(-2.2267)	(-7.6119)
NEWSOELAW*Gov	2,6315	5,3711	7,748	-0,0143	-0,1988	-0,4182	-0,283	5,8178
	(-2.641)	(-6.2424)	(-32.0749)	(-3.6786)	(-1.1596)	(-3.8969)	(-1.2608)	(-7.6382)
Constant	13,3531	10,8454	8,6057	4,2008	-0,1956	-4,3942	0,8735	-37,1988
	(-17.4817)	(-25.3156)	(-169.0996)	(-12.0848)	(-2.1116)	(-9.7207)	(-1.2196)	(-63.1998)
Observations	321	321	321	321	321	321	321	321
R2	0,1656	0,1661	0,0846	0,2298	0,2301	0,2259	0,3043	0,2837
Adjusted R2	0,1469	0,1474	0,0641	0,2126	0,2128	0,2086	0,2887	0,2677

Note: *p<0.1; **p<0.05; ***p<0.01

Table 35 – DiD Results With Balanced Panel Without Control Variables

	ROA	ROE	OP	DY	SEf	AEf	MTB	ESG
GOV	-3,0527	-9,1569	-10,4332	-1,3062	-1,001	-1,2755	-1,5532	-4,0408
	(-3.0282)	(-8.6724)	(-16.3551)	(-3.9246)	(-1.7951)	(-3.7232)	(-1.9579)	(-16.2824)
NEWSOELAW	-2.6013***	-4.1655*	-2,5834	-1,469	0,979	2,7752	0,3122	5,834
	(-0.9715)	(-2.2283)	(-2.961)	(-1.2221)	(-1.0422)	(-3.5898)	(-1.0847)	(-5.1774)
NEWSOELAW*Gov	2,785	5,2134	6,7032	-0,7417	-0,3375	-0,9363	-0,192	-1,5267
	(-2.045)	(-4.3172)	(-11.5069)	(-2.1825)	(-1.0699)	(-3.7523)	(-1.0853)	(-11.1206)
Constant	7.6580***	19.3779**	25.9201***	6.3867**	1,7773	3,3965	2,3663	35.9224**
	(-2.6967)	(-7.7891)	(-9.4342)	(-3.229)	(-1.7816)	(-3.5308)	(-1.9572)	(-14.0015)
Observations	321	321	321	321	321	321	321	321
R2	0,0965	0,1056	0,0666	0,0473	0,2001	0,1696	0,2109	0,0211
Adjusted R2	0,0879	0,0971	0,0577	0,0383	0,1925	0,1618	0,2034	0,0119