VIETNAM NATIONAL UNIVERSITY HO CHI MINH CITY
UNIVERSITY OF ECONOMICS AND LAW

NGUYEN VAN TAN

THE IMPACT OF EQUITIZATION ON FIRM PERFORMANCE: EVIDENCE FROM VIETNAMESE STATE-OWNED ENTERPRISES

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Ho Chi Minh City, 2022

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Reviewer 1: Assoc. Prof. Dr. Nguyen Anh Phong
Reviewer 2: Assoc. Prof. Dr. Nguyen Hong Thang

ADVISOR
Assoc. Prof. Dr. Trinh Quoc Trung

Double-blind peer review
Reviewer 1: Prof. Dr. Vo Xuan Vinh
Reviewer 2: Dr. Nguyen Thanh Cuong

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DECLARATION

I am Nguyen Van Tan, declare that this Ph.D. dissertation entitled “The impact of equitization on firm performance: Evidence from Vietnamese state-owned enterprises” is my own work under supervision from Assoc. Prof. Dr. Trinh Quoc Trung - University of Economics and Law, VNU-HCM, Ho Chi Minh City, Vietnam. The dissertation contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma.

Ph.D. Student

Nguyen Van Tan

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
ATE	Average treatment effect
DID	Difference-in-difference
EMPL	Total number of employees
GDP	Gross domestic product
HNX	Hanoi Stock Exchange
HOSE	Hochiminh Stock Exchange
KPIs	Key Performance Indicator
IPO	Initial public offering
LV	Leverage
MEBOs	Management employee buyouts
NIEFF	Net income efficiency
NPM	New public management
PSM	Propensity score matching
ROA	Return on assets
ROE	Return on equity
ROS	Return on sales
SAL	Real sales
SALEF	Sales efficiency
SEO	Seasonal public offering
SIE	Share issue equitization
SIP	Share issue privatization
SOEs	State-owned enterprises
SSC	The state securities commissions of Vietnam
TAS	Total asset turnover
VND	Vietnam Dong
VGSO	General Statistics Office of Vietnam

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ABSTRACT

Privatization topics have attracted research interests from several researchers all over the world. With inconsistent results due to different privatization policies and estimation methods, the study of privatization on firm performance has been voluminous, especially in transition economies. Based on equitization characteristics in Vietnam and five research gaps existing, the author has chosen the research topic to examine how equitization impacts firm performance in Vietnam. This dissertation has employed a combination of difference-in-difference, with-without comparison and regression methods to analyze how equitization impacts firm performance in Vietnam. Research results show that equitization only helps enterprises improve profitability if considering return on assets (ROA) compared with non-equitized enterprises in the same periods. Also, equitization only helps firms improve profitability compared with non-participating firms (change in ROA) when firms are no longer under state control after equitization (average rate of state ownership after four years of equitization less than 50%). Tax incentive policy has no impact on profitability improvement (change in ROA) and operating efficiency change (change in total asset turnover). Finally, listing status has a positive impact on ROA improvement after equitization in Vietnam. This result shows that listed firms have greater ROA improvement than unlisted firms after equitization. Besides, research results show that there is an underpricing phenomenon in the short run but overpricing in the long run.

Based on research findings, the dissertation proposes some recommendations for equitized state-owned enterprises (SOEs), non-equitized enterprises, investors and the Vietnamese government in Vietnam.

Chapter 1
INTRODUCTION

This chapter represents problem statements to explain reasons why the dissertation is necessary. Also, the chapter includes a background of the research, research gaps and introduction of the dissertation.

1.1 Problem statements

According to the Vietnamese Steering Committee for Enterprise Renovation and Development (2021), the Vietnamese Government conducted equitization through three phases, and the first phase took place from 1992 to 2000.

Although equitization has brought many benefits to boost economic development, equitization still has some limitations in Vietnam. First, Vietnam has applied incentive policies for equitized enterprises such as tax incentives (Decree 164/2003/ND-CP), land lease (Decree 51/1999/ND-CP), and land allocation for enterprises after equitization, but these policies create unfair competition for other enterprises. Incentive policies do not create an efficient market as the efficient market theory refers to, thereby creating information speculation, giving speculators an advantage in investing in equitized enterprises. Tax incentives can affect firm performance because they can affect profit after tax directly. Second, while other developed and developing countries conducted “privatization” programs (i.e. selling state assets to the private sector, keeping only a few key SOEs to regulate the economy), Vietnam has chosen the "equitization" policy. The Vietnamese Government often uses the ‘equitization’ term instead of ‘privatization’ because equitization is the process of transferring assets of state-owned enterprises (SOEs) to the private sector, and the State still holds dominant shares of equitized SOEs after equitization in many cases (Loc, 2006; Tran *et al.*, 2015). The purpose of equitization is to accomplish four major objectives, including arranging, equitizing, divesting state capital so that SOEs have a more rational structure to improve operating efficiency and good governance to meet international standards in Vietnam. It is because the goal of Vietnam's equitization is to retain the state's directing power in the majority

of enterprises after equitization. According to the theory of competitive advantage, there are different impacts of equitization on firm performance improvement based on industries. Finally, there is low assets valuation of state-owned enterprises with many problems and a lack of transparency easily leads to the loss of the state capital (Tam, 2019). Some SOEs sell “golden real estate” to the private sector at a low price, leading to many problems, such as Tan Thuan investment and construction company Ltd., protrade corporation (Binh Duong), civil engineering construction corporation no.1 (CIENCO1), etc. Thus, equitization makes it difficult for enterprises to improve firm performance.

In addition, equitization in Vietnam has also been carried out gradually (Loc, 2006; Tran *et al.*, 2015), leading to stagnation and lack of active participation in enterprise innovation, thereby making it difficult to improve firm performance after equitization. The new public management theory suggests that privatization transfers control of service delivery to the private sector and this transfer helps firms operate more effectively than SOEs with state control. The efficient market theory also states that there should not be state interference in the market to build an efficient capital market because security prices reflect all the information that investors already know.

However, with the control of the state representatives, the transparency of information, the disclosure of all information on the stock market do not exist in Vietnam. Typically, there are few equitized SOEs listed on the stock market (The World Bank, 2020). The reason is also due to disagreement in the shareholders' council, where the state representative plays a dominant role in information disclosure. Thus, it is clear that the state's domination of the majority of equitized enterprises in Vietnam has been against economic theories, including the theory of new public management and the efficient market theory. There is low assets valuation of equitized enterprises in many cases, listing delay, lack of information disclosure and transparency of all enterprises after equitization. Also, the equitization progress has been so slow due to gradual divestment based on the equitization nature in Vietnam. Thus, it is necessary to study the IPO valuation, the impact of equitization

on firm performance when considering tax incentives and state ownership divestment (deregulation) in Vietnam.

Privatization topics have attracted research interests from several researchers all over the world. However, empirical studies have inconsistent results on the impact of privatization on firm performance. Most of these empirical studies apply firm performance measures proposed by Megginson *et al.* (1994). Empirical studies in developed countries mainly apply a pre-post comparison method and indicate that privatization can help privatized firms improve firm performance (Brown *et al.*, 2016); Dewenter and Malatesta, 2001). Also, the State just remain some SOEs and mostly transfer state assets to the private sector in developed countries, helping privatized firms restructure ownership, operation, focus on maximizing profits. Developed countries have tried to create efficient markets indicated in the efficient market theory where the market reflects all stock prices and investors can make decisions easily and help privatized SOEs easily access capital. Most empirical studies in Vietnam apply a pre-post comparison method and with-without comparison method also indicate that equitization can help equitized SOEs improve firm performance (Loc *et al.*, 2006). However, Pham (2017) suggests that equitization may not have a positive impact on firm performance. These results are similar to empirical studies in China, where privatization is less likely to improve firm performance of privatized SOEs (Jiang *et al.*, 2009). Empirical studies in both developed and developing countries have inconsistent results because of different research methods, firm performance measures and different contexts. According to the new public management theory and efficiency market theory, the state interference in equitized SOEs can not create an efficient market in Vietnam. Besides, few studies have considered the impact of equitization on firm performance when considering non-equitized SOEs, especially in Vietnam. Tran *et al.* (2015), Loc and Tran (2016) have not considered industry when choosing two participating and non-participating firms leading to a biased comparison.

Based on the above reasons, the author has chosen the topic “The impact of equitization on firm performance: Evidence from Vietnamese state-owned enterprises” for the doctoral dissertation.

1.2 Background of the research

First, the number of studies on the privatization impact on firm performance of privatized SOEs when considering non-privatized enterprises in the same periods is limited, mainly conducted in China. Previous studies in developed and developing countries use the pre-post comparison method to assess the impact of privatization on firm performance without considering non-participating firms. This also raises the question of whether equitization can improve the firm performance of equitized SOEs compared with non-participating firms in Vietnam.

In particular, quantitative studies often use the pre-post comparison method to measure changes in firm performance measures after privatization compared to the pre-privatization period, and this method was first proposed by Megginson *et al.* (1994). This method calculates the average values of the post-privatization and pre-privatization firm performance measures. Then, this method uses the t-Test and Man Whitney test to test changes in mean and median values of firm performance measures through pre-post privatization windows. Since Megginson *et al.* (1994) proposed seven firm performance measures, the following studies have often applied these measures or have adjusted them to measure firm performance. These measures include (1) profitability (ROE, ROA and ROS); (2) operating efficiency (sales/number of employees, net income/number of employees); (3) capital investment (capital expenditures/sales, capital expenditures / total assets); (4) output (nominal sales/consumer price index); (5) employment (total number of employees); (6) leverage (total debt/total assets, long-term debt/equity); and, (7) payout (cash dividends/sales, cash dividends/net income).

Many research works have applied the pre-post comparison method, including research work by Pham (2017) when studying how privatization impacts on firm performance of privatized SOEs in Vietnam. Sakr (2014) also applies the pre-post comparison method to analyze how privatization impacts Egypt's firm performance. Other research works also apply this method in other countries such as in Egypt (Alipour, 2013) in China (Ho *et al.*, 2011; Huang and Wang, 2011; Jiang *et al.*, 2009). Recent studies have also applied a with-without comparison method through propensity

score matching techniques (PSM) evaluating the impact of privatization on firm performance.

Tran *et al.* (2015) combine to use pre-post comparison, with-without comparison method and regression to examine the effects of privatization on firm performance of 309 privatized enterprises in Vietnam in 2009. However, considering the firm size and year of establishment is not reasonable in the PSM technique because there are still biases when the authors may compare privatized and non-privatized enterprises in different industries. Some other empirical studies also apply the regression approach (Liao *et al.*, 2014; O'Toole *et al.*, 2016; Ochieng and Ahmed, 2014; Wang and Shailer, 2015). Sprenger (2014) uses a sample of 497 Russian privatized and non-privatized firms surveyed in 1999-2000 without using propensity score matching to identify privatized and non-privatized firms.

Thus, most previous studies have applied the pre-post comparison method, so the effects of privatization on participating SOEs have not been considered compared with non-participating SOEs. Also, the studies mentioned above have inconsistent results on the impact of privatization on firm performance in different countries, depending on the evaluation method, privatization method, privatization policy or the economic landscape and characteristics of the privatized SOEs (Estrin and Pelletier, 2018; Iwasaki and Mizobata, 2018). Therefore, studying equitization policies and the impact of equitization policies on firm performance is an issue that needs to be studied and clarified in Vietnam. There have been few empirical studies, especially doctoral dissertations evaluating the equitization impact on firm performance in Vietnam. Linh (2017) studies the equitization progress of large-scale SOEs in Vietnam while Hoa (2016) reviews policies for Vietnamese equitized state-owned enterprises in the textile industry. Tien (2019) identifies determinants of business income of equitized SOEs in Vietnam without evaluating how equitization impacts on firm performance of equitized SOEs.

Second, the major privatization objectives of other countries are to privatize public assets, the state only retains some SOEs in key areas. However, the purpose of Vietnamese equitization is to accomplish some major objectives, including arranging,

equitizing, divesting state capital so that SOEs have a more rational structure to improve operational efficiency and good governance to meet international standards in Vietnam. With the equitization nature of gradual divestment or deregulation, the State still controls equitized SOEs after equitization in Vietnam. Thus, these enterprises can not restructure ownership, operations and improve firm performance after equitization.

According to the new public management, the state should conduct privatization programs and transfer the rights to provide public services to the private sector to enhance service quality. The public choice theory also indicates that individuals or organizations should make decisions themselves for efficiency. The state representatives still hold high ownership to control decision-making and voting rights in enterprises after equitization in Vietnam making it difficult to disclose and transparent information about enterprises after equitization. These enterprises cannot meet the requirements of listing on the market and building an efficient market. The efficient market theory assumes that a firm's market value is reflected through complete information about past, present information and market events. However, it is difficult for Vietnam to build an efficient capital market because most equitized SOEs have not listed on stock markets. Therefore, it is important to study whether state representatives should hold more than 50% of the shares after equitization. Loc *et al.* (2006) only study the change in firm performance after equitization when the state holds more than and less than 30% of ownership rates in Vietnam.

Third, according to the theory of competitive advantage, firms operating in different industries have different competitive advantages and these advantages can affect firm performance. If privatized firms are in highly competitive sectors, their firm performance after privatization is much better than those in less competitive industries (Sheshinski and López-Calva, 2003). Most of the empirical studies have applied the pre-post comparison and regression method to consider the impact of privatization on firm performance according to different industries. It means that these studies have not considered non-equitized SOEs in the same period. At present, the Government has issued Decision 22/2021/QD-TTg to maintain 100% state

ownership in 13 industries and over 50% state ownership of the charter capital in 14 industries. The government has changed the number of industries to maintain state ownership and choose equitized SOEs based on these criteria. However, there have been few empirical studies explaining which industry groups have firm performance improvement after equitization to support the decision of remaining some specific industries.

Fourth, incentive policies when conducting privatization help promote the privatization process in countries, encouraging firms to participate in privatization programs. However, government intervention using incentive policies creates unfair competition for other enterprises (Estrin and Pelletier, 2018; Iwasaki and Mizobata, 2018). The efficient market theory explains that firm value and security prices are fully represented in the market because relevant information has been disseminated and fully reflected. However, the application of preferential policies, in general, will create many impacts on firm value, the market value of enterprises then depends on the intervention of the Government's policies to some enterprises.

Countries in developed countries, Russia and China often only apply preferential policies to all enterprises according to investment fields and areas of operation, but not exclusively for privatized enterprises. Therefore, Vietnam has applied preferential tax policies, land rental, etc for equitized enterprises, which are specific policies that need to be fully evaluated and studied. Currently, studies in Vietnam have not assessed whether tax incentives help equitized enterprises improve firm performance. Also, most of the empirical studies in Vietnam have not examined how listed firms improve firm performance compared to unlisted firms after equitization in Vietnam.

Finally, Vietnamese managers determine their enterprise values before submitting to the equitization steering committee for approval of equitization plans. Equitized SOEs can ask auditing service firms for firm valuation/ assets pricing to ensure a more accurate firm valuation. However, many problems have taken place concerning the firm valuation of equitized enterprises. The state representatives of equitized enterprises set low firm value, especially the real estate price to sell to the

private sector at a low price of state property for their benefits, thereby causing the loss of state property (Tan Thuan investment and construction company Ltd., protrade corporation, Binh Duong, civil engineering construction corporation No.1, etc). Market feedback theory and efficient market theory state that underpricing through privatization can be determined by the market and responded to when firms are listed on the stock market.

However, underpricing of state assets when equitization leads to state budget losses, creating a manipulative phenomenon in equitization, which cannot create an efficient market like the market theory proposed. Tran *et al.* (2015) conclude that Vietnamese IPOs are underpriced by 38% (considering the raw first-day return - AR_i) and 49% (considering the market-adjusted abnormal return - $MAAR_i$). This study does consider equitized enterprises and private enterprises through an initial public offering (IPO), so the study can not explain how equitized SOEs are underpriced or undervalued.

After summarizing the background of the study, the author finds out some gaps as follows:

(1) There are still limited studies on how equitization impacts firm performance when considering non-equitized SOEs in the same period. Tran et al. (2015), Loc and Tran (2016) have not considered the industry when choosing two participating and non-participating groups, leading to a biased comparison.

(2) The divestment progress in Vietnam is plodding due to its gradual equitization nature. Thus, studying how state ownership changes affect the firm performance of equitized SOEs is necessary. There is an unanswered question whether the State should hold over 50% shares in equitized SOEs after equitization.

(3) There should be a study to evaluate how firms in specific industry groups can improve firm performance to support the equitization selection criteria because empirical studies have found that firm performance is improved dissimilarly according to industry groups.

(4) Equitization policies in Vietnam are also different from other countries. So, studying these typical equitization policies that impact Vietnam's firm performance

will reflect the equitization nature in Vietnam. There is a gap in analyzing how equitization impacts equitized SOEs with tax and without tax incentives in Vietnam. The difference in firm performance improvements between listed firms and unlisted firms after equitization should be addressed in Vietnam.

(5) The equitization characteristics in Vietnam have some differences compared to privatization in developed and developing countries. In particular, assets valuation when equitization has faced many difficulties in Vietnam, leading to the slow equitization progress. This dissertation focuses on assessing the underpricing phenomenon level of state-owned enterprises in both the short run and long run to determine whether there is underpricing or overpricing in asset valuation of state-owned enterprises when equitization, especially if adjusted according to market values.

1.3 Research objectives

1.3.1 General research objectives

The study primarily aims to identify the impact of equitization on firm performance changes in Vietnam compared with non-equitized SOEs in the same periods, especially by average state ownership rates after equitization and industry groups. The equitization impacts can be determined by tax incentives for equitized SOEs. Also, the dissertation examines differences in firm performance changes between listed and unlisted firms after equitization and underpricing in the short run and long run in Vietnam. Based on research findings, the author proposes some recommendations for investors, SOEs and the Vietnamese Government.

1.3.2 Specific research objectives

Based on research gaps and general research questions, this dissertation aims to:

Identify whether equitization helps equitized SOEs improve firm performance than non-equitized SOEs in the same period.

This dissertation examines the different impacts of equitization on firm performance of equitized SOEs with different average state ownership rates after equitization (below 20%, 20% up to 30%, 30% up to 50%, 50% up to 65% and above 65%).

Examine the different impacts of equitization on firm performance of equitized SOEs according to different industry groups.

This dissertation analyzes how equitization impacts on firm performance of equitized SOEs with tax and without tax incentives. The dissertation also examines differences in firm performance changes between listed and unlisted firms after equitization in Vietnam.

Evaluate IPO underpricing of SOEs in the short run and long run when participating in the equitization program.

1.4. Research questions

How can equitization impact on firm performance of equitized SOEs when compared with non-equitized SOEs in the same period?

How does equitization impact on firm performance of equitized SOEs with different average state ownership rates after equitization (below 20%, 20% up to 30%, 30% up to 50%, 50% up to 65% and above 65%)?

How does equitization impact on firm performance of equitized SOEs according to different industry groups?

How does equitization impact on firm performance of equitized SOEs with tax and without tax incentives in Vietnam? Do listed firms have higher firm performance improvements compared to unlisted firms after equitization in Vietnam?

How about underpricing levels in the short run and long run in Vietnam?

1.5 Research object and research scope

1.5.1 Research object

This dissertation focuses on analyzing typical equitization characteristics in Vietnam and the impact of equitization on firm performance of equitized SOEs after equitization. This dissertation only uses two firm performance measures, including change in ROA (dROA) and change in total assets turnover (dTAS) for analysis.

1.5.2 Scope of the study

Content: This dissertation examines how equitization impacts on firm performance of equitized SOEs after equitization in Vietnam. Also, this dissertation examines listing, underpricing and overpricing phenomenon of equitized SOEs.

Extent and time: This research uses SOEs' secondary data in two main phases of the Vietnam equitization process (SOEs equitized from 2006 to 2015). This dissertation uses General Statistics Office of Vietnam (VGSO) data about firm performance from 2002 to 2019 because of four-year equitization windows. Applying four-year equitization windows help the author analyze the impact of tax incentives on firm performance in Vietnam. Besides, the dissertation applies data from Hanoi Stock Exchange (HNX) and Hochiminh Stock Exchange (HOSE) to examine underpricing in the short run and long run.

1.6 Research methodology and data

1.6.1 Research methodology

The research paper adopts qualitative and quantitative research methodology.

For the first research objective: This dissertation applies qualitative research methodology for summarizing previous empirical studies on the impact of privatization and equitization on firm performance. Some related theories explain equitization impact to identify the research model for the average treatment effect approach through PSM. This dissertation also adopts a with – without comparison method to evaluate how equitization impacts change in equitized SOEs' firm performance when considering non-equitized SOEs in the same periods. Difference-in-difference (DID) method is similar to the pre-post comparison method, but the DID approach uses subtractions of performance changes to calculate DID measures.

According to Khandker *et al.* (2009), a with-without comparison method is another option when evaluating a program's effectiveness. This method is applied through a technique known as propensity score matching, and Rosenbaum and Rubin (1983) were the first researchers to propose this method. This method's advantage is that it eliminates the possibility of selection bias because it allows choosing two participants in the program that have some similarities in characteristics. Claessens and Djankov (2002) and Pohl *et al.* (1997) suggest using this method to assess the impact of privatization on firm performance in European countries.

This study employs the with-without comparison method but chooses four variables of firm size, the number of operating years, industry, and equitization year to determine

the propensity score to identify similarities between the treatment and control group. Besides, this dissertation also adopts a robustness test for testing result consistency (Khandker *et al.*, 2009). This study uses direct nearest-neighbor matching (nnmatch) and five nearest-neighbor matchings (psmatch) for the robustness testing of the average treatment effect on the treated (ATE). The studies by Loc and Tran (2016), Hung *et al.* (2017) only use radius matching (0.001).

For the second research objective: This dissertation also applies the average treatment effect approach through PSM to consider the different impacts of equitization on firm performance based on average state ownership rates after equitization (below 20%, 20% up to 30%, 30% up to 50%, 50% up to 65% and above 65%).

For the third research objective: This dissertation adopts the average treatment effect approach through PSM to consider the different impacts of equitization on firm performance according to industry groups.

For the fourth research objective: This dissertation applies qualitative research methodology to summarize previous studies, related theories explaining how privatization/equitization impacts firm performance to identify a regression model evaluating how tax incentives and listing impact on firm performance changes of equitized SOEs.

For the final research objective: This dissertation uses the t-Test comparing underpricing measures with zero to consider whether these firms are underpriced in the short run and long run. This dissertation also applies four different underpricing measures, including AR_i (%) (raw first-day return), $MAAR_i$ (%) (market-adjusted abnormal return), AR_t (the average benchmark-adjusted return), $CAR_{0,t}$ (cumulative benchmark-adjusted long-run performance).

1.6.2 Data

The dissertation applies firm performance data of SOEs equitized from 2006 to 2015 and 418 non-equitized SOEs in the same period from VGSO. After comparing with the information about equitized enterprises of the steering committee of enterprise innovation and development, the author keeps 295 SOEs from equitized 2006 to 2015

and 418 non-equitized SOEs in the same period with adequate firm performance information.

There are some steps for collecting and calculating firm performance measures or variables in this dissertation. First, the author identifies the number of equitized SOEs based on the list of the Steering Committee of Enterprise Innovation and Development. Second, the author checks again with survey data from the General Statistics Office of Vietnam to make sure there is enough firm performance information. Finally, the author filters data from the General Statistics Office of Vietnam to calculate suitable firm performance measures.

1.7 New contribution

1.7.1 In the theoretical aspect

Most of the related privatization theories have not considered the benefits of privatization for privatized SOEs compared with non-privatized firms. Also, there have been few empirical studies examining how incentive policies through privatization programs affect firm performance changes of privatized firms. This dissertation finds that equitization helps firms improve profitability (dROA) but does not help firms improve operating efficiency (dTAS) compared with non-equitized enterprises in the same periods.

Deregulation has been an interesting topic over decades and there have been many theories explaining the roles of the State in countries, including the “invisible hand”, “visible hand”, the mixed economy, the public choice and the new public management theories. There have been still arguments on State deregulation and the roles of the State. Research results from this dissertation show that equitization only helps firms improve profitability compared with non-participating firms (dROA) when firms are no longer under state control after equitization (average rate of state ownership after four years of equitization is less than 50%).

Empirical studies from developing and developed countries have shown that there is underpricing in the short run but overpricing in the long run. Most of these empirical studies have applied signaling, market feedback and efficient market theories explaining that the pre-IPO profitability can signal investors to make IPO

investments in privatized firms, leading to underpricing or overpricing. This dissertation generalizes existing theories on the short-run underpricing in Vietnam, including the market feedback theory, the signaling theory and the divergence of opinion theory.

1.7.2 In the practical aspect

This dissertation proposes some recommendations for the Vietnamese Government, equitized SOEs, non-equitized SOEs and IPO investors.

The Vietnamese Government has always encouraged SOEs to participate in equitization but the number of equitized SOEs has declined since 2007. Most large-scale SOEs were not equitized in the first two equitization stages or there is complexity in asset pricing, IPO pricing, ownership restructuring and complicated procedures, etc. However, in addition to the annual report on the number of equitized SOEs by the Steering Committee for Renovation and Development of Vietnam, the government has not yet made a formal report on the firm performance of equitized SOEs after equitization compared with non-equitized SOEs in the same period. Besides, equitized SOEs with state control after equitization do not improve firm performance compared with non-equitized ones.

From research results, equitized SOEs can improve profitability (dROA) compared with non-equitized SOEs in the same period when they participate in equitization programs and unlisting can not help equitized SOEs improve firm performance.

There are many unlisted firms after equitization in Vietnam and investors can have suitable decisions based on the research results of this dissertation. Generally, IPO investment can help investors get initial returns because there is short-run underpricing. However, overpricing, in the long run, can infer that investors should not hold IPOs shares for a long time.

1.8 The research framework

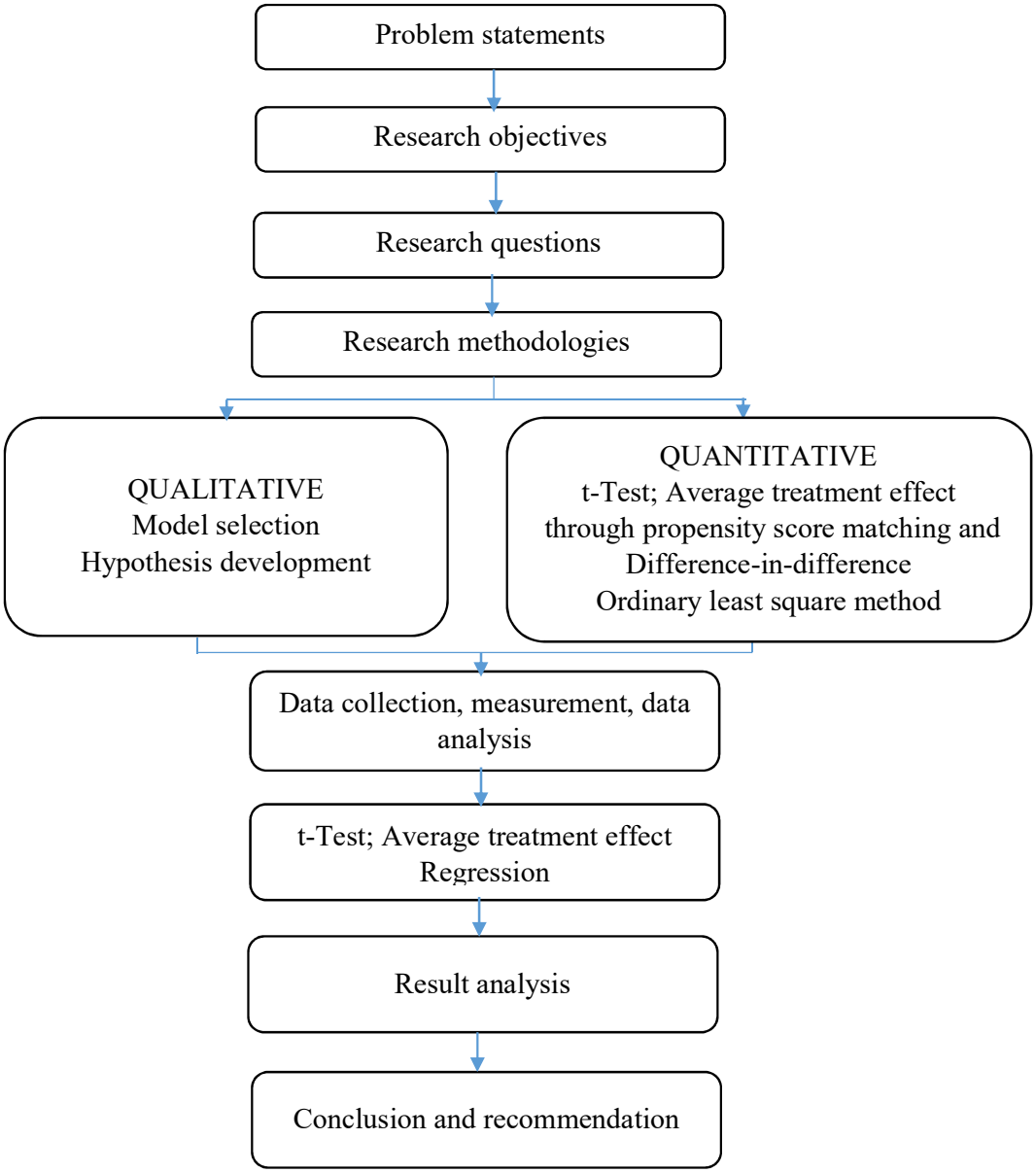

Figure 1.1. The research framework

Source: proposed by the author

1.9 Structure of the dissertation

Except for the table of contents, appendices, this dissertation includes five chapters, and each chapter has a separate summary part.

Chapter 1. Introduction

This chapter provides an overview of the doctoral dissertation, including problem statements, the background of the study, research objectives and research questions, research object and research scope, research methodology and new contribution of the study.

Chapter 2. Theories and empirical studies on equitization and firm performance.

This chapter contents include definitions of privatization/ equitization and firm performance, some relevant theories explaining the impact of privatization on firm performance, empirical evidence on the impact of privatization on firm performance and research gaps.

Chapter 3. Methodology, data and research models

This chapter represents some sufficient steps of the study, hypothesis development, and research models. The remaining contents include estimation method, data collection and description and measurement of firm performance.

Chapter 4. Research results

This chapter includes an analysis of firm performance of equitized SOEs in the pre-post equitization periods. From this analysis, this chapter comes up with some conclusions about Vietnamese equitization and the firm performance of equitized SOEs in the pre-post equitization periods. Based on quantitative results, this chapter analyzes how equitization impacts the firm performance of equitized SOEs using the regression approach and propensity score matching. Hypothesis testing will also be represented in this chapter.

Chapter 5. Conclusions and recommendations

This chapter contents include conclusions and recommendations for equitized SOEs, non-equitized SOEs, investors and the Government.

Chapter 2
THEORIES AND EMPIRICAL STUDIES ON EQUITIZATION AND FIRM PERFORMANCE

Privatization or equitization has significant influence on achieving economic development objectives across nations in the world. This chapter represents definitions of privatization/ equitization and firm performance, relevant theories, and empirical evidence on the privatization or equitization impact on firm performance.

2.1 Definitions of privatization/ equitization and firm performance

2.1.1 Definitions of state-owned enterprises

According to the OECD's definition (2017), state-owned enterprises (SOEs) include any enterprises where the state has significant control through full of majority ownership. SOEs definitions vary from country to country and depend on government policies in each country. According to Lin *et al.* (2020), SOEs can be classified into perfect competitive sectors and strategic sectors (i.e., key industries related to national security and national economic lifelines). In this case, SOEs in perfect competitive sectors can freely compete with private firms with little support from the Chinese government. Bernier *et al.* (2020) explain that SOEs can be organizations directly producing public services, ultimately owned or partially controlled by the public sector to accomplish public missions and the public ownership can be shifted to the private sector. SOEs have state ownership and these firms are wholly or partially owned and controlled by the state or government in different countries. According to Peng *et al.* (2016), SOEs play important roles in regulating economies and contributing to national gross domestic product (GDP).

There have been inconsistent concepts about the roles of the state by theories ad empirical studies. The "Invisible hand" economic theory explains that the State should not regulate the economy because a country's wealth is not due to strict Government regulations but the wealth of nations comes from the freedom of firms and individuals in one economy. However, when capitalism developed with highly developed productive forces and the appearance of economic recession, state intervention and

regulation are necessary according to “visible hand” theory. Up to now, the theory of mixed economy theory has been applied popularly because this theory overcomes the limitations of the invisible hand theory and the Keynesian theory on the Government's role in a country's economy. The state should regulate the economy when necessary to ensure an efficient market according to efficient market theory. To define SOEs appropriately, Kornai (1992) and Peng (2000) have summarized a comparison between private firms and SOEs as indicated in Table 2.1.

Table 2.1 Comparison between private firms and state-owned enterprises

Category	Private firms	SOEs
Firm objectives	Maximize profits for private owners/ shareholders	Profit maximization is one of the firm objectives. The important objective is to ensure employment and social wealth fare
Financing	From private sources or shareholders	From the state by direct subsidies or budget
Liquidity	Firms have to declare when bankruptcy	State representatives decide to support or not support when SOEs have bankruptcy
Management appointment	Owners/ investors make management appointment	State representatives make management appointment
Ownership restructuring	Nationalization can be applied for private firms to be SOEs	Privatization/ equitization can be applied to transfer SOEs to private firms

Source: Kornai (1992) and Peng (2000)

Private firms and SOEs have different characteristics, including firm objectives, financing activities, liquidity, management appointment and ownership restructuring (Kornai, 1992; Peng, 2000). Private firms try to maximize profits for private owners or shareholders when they are publicly listed on stock markets but SOEs have other operational objectives. SOEs have major objectives of ensuring employment and social wealth fare. SOEs mainly get funded from the state through direct subsidies or budget and state representatives decide to support or not support when SOEs have bankruptcy but private firms do not receive state support in this case. Private firms can become SOEs through nationalization programs and SOEs can become private firms through privatization/ equitization programs.

Definitions of SOEs are presented in law on enterprise in Vietnam. In 2020, the Vietnamese government has issued a new law on enterprise to have a new

definition of SOEs. SOEs are enterprises holding over 50% of charter capital by the State, the total number of shares with voting rights as prescribed in Article 88, Law on enterprise 2020.

Many different SOEs' definitions depend on government policies. However, SOEs are legal entities of a government to take part in commercial activities on the government's behalf. They are either wholly or partially owned by a government and governments use them as a tool to regulate the economy. With the new laws on enterprises in 2020, the number of SOEs is considerable because equitization has been partial in Vietnam and there are many equitized SOEs above 50% of state ownership. Thus, the new law on enterprise can affect the equitization plan in the future in Vietnam.

2.1.2 Privatization/ equitization

2.1.2.1 Definitions of privatization/ equitization

Privatization

Large-scale privatizations began in West Germany in 1957, under the direction of Prime Minister Konrad Adenauer. After that, British Prime Minister Margaret Thatcher continued to set up a privatization program in the UK in the early 1980s. According to Megginson and Netter (2001), “privatization” is known as transferring assets from state ownership to private ownership. Privatization is a necessary process for the States and SOEs because it facilitates the reallocation of SOEs' resources through private ownership involvement.

“Privatization” concept comes from the new public management theory, public-choice theory, the neo-Austrian school, and property-rights theory (Gruening, 2001). Privatization means greater reliance on the private institutions of society and less dependence on government to satisfy people's needs. According to Savas (2000), Privatization takes many forms: contracting, franchising, vouchering, selling and leasing government-owned assets to the private sector, shedding services and deregulating. The various forms of privatization all operate by allowing markets to provide desired goods and services to consumers. Public managers and decision-

makers face complex choices about which public services and functions should be kept in the public sector and which should be privatized (Savas, 2000).

In various studies, the concept of privatization is not the same. Privatization can be understood as a shift from public involvement (as a whole or one part) to private concerns (Hirschman, 1982). Thus, privatization can be the withdrawal of the state to transfer rights of providing public services to the private sector. Privatization can have two meanings, including any shift of activities from the state to transfer rights to the private sector and any shift from the public sector to the private sector to ensure the transfer process of production of public goods and services can be provided by the private sector (Starr, 2014). Starr (2014) indicates that privatization can be all reductions in the regulator and spending activity of any States or there is deregulation or state ownership decrease in the public sector to ensure a shift from the public to the private sector for providing goods and services. Citizens have many choices from using goods or experiencing services by the private sector instead. There are two types of privatization, including policy-driven and demand-driven privatization (Starr, 2014). The demand-driven occurs when there is demand in participation of the private sector in some fields, such as education, health care, or retirement income. The policy-driven privatization occurs when State would like to make transfer decisions for the rights of production of goods and services from the public to the private sector. However, the meanings and policies are different in countries due to country positions, periods and characteristics.

Schmidt (1996) explains that privatization brings benefits of improving firm performance and increasing State budgets but this program can reduce the rights of politicians or State representatives in public firms. Thus, privatized firms have a reduction in subsidies from the state after privatization. According to Boycko (1996), politicians may use subsidies to convince privatized SOEs not to restructure their own or participate in privatizations because they would like to ensure their control and benefits over public firms. However, there should be a privatization program to restructure public firms to overcome the inefficiency of a public firm.

Megginson *et al.* (1994) conclude that privatization is the process of reducing state ownership. Privatization is a process of asset and land redistribution from state ownership to private ownership. According to Megginson *et al.* (1994), there are seven objectives of privatization program to (1) raise revenue for the State; (2) promote increased efficiency; (3) reduce Government interference in the economy; (4) promote wider share ownership, (5) provide the opportunity to introduce competition; (6) expose SOEs to market discipline and (7) develop the national capital market.

Based on the above discussions, the concept of privatization can be understood as a process of transferring state ownership to form private ownership, which is directed by Governments. Most researchers and politicians admit the benefits of privatization and there should be a shift from the public sector to the private sector the rights of production of goods and services because of firm performance improvement and economic gains. The State should only remain some key public firms to regulate economies instead of remaining state interference in most public firms. Successful privatization programs from the United Kingdom (the U.K), the United States (the U.S) and other developing countries have shown that privatization has brought a lot of benefits for both firms and economies.

Equitization

In Vietnam, the term "equitization" is only used instead of "privatization" because equitization in Vietnam does not mean that the State sells all its assets to the private sector. The State still holds dominant shares of equitized SOEs in many cases. This is done through the market economy with a multi-ownership structure in socialism orientation.

Sjöholm (2006) characterizes equitization similarly with privatization in Vietnam compared with other countries. However, the author has used the words “modest” and “cautious” to explain equitization in Vietnam. The Vietnamese government has issued lists of SOEs that need to participate in equitization programs in different periods. After each period of 5 years, the government analyzes achievements and limitations of the equitization program to issue policies and lists of equitized SOEs in the following

periods. Equitization can be understood as a shift from the public sector to the private sector for the production of goods and services with a strategy of gradualism in Vietnam (Sjöholm, 2006). Even in China, the Chinese government uses the term of privatization instead of equitization like in Vietnam although the Chinese government also applies a gradual strategy of divestment in privatization programs (Huang and Wang, 2011).

According to Ngu (2002), equitization definition in Vietnam was first introduced in 1992 and it indicated the process to transfer rights of production of goods and services to the private sector gradually with the objectives of mobilizing capital among SOEs individuals, developing firms but ensuring the supervision of society over firm operations. However, Loc (2006) applies "privatization" instead of "equitization" in Vietnam because privatization and equitization are quite similar in nature to transferring the production of goods and services from the public to the private sector. Equitization or privatization started in 1992 in Vietnam and it was one part of the State-owned enterprise reform program. Equitization is the transformation of SOEs into joint-stock firms through selling state shares to the private sector for improving firm performance and receiving state revenue. Equitization does not mean that the State loses control over SOEs compared with privatization in Western privatization countries. The State still holds dominant shares for voting rights in many cases with state intervention and slow gradual divestment progress. Tran (2016) has used privatization term in the Vietnam context because equitization is not so different from privatization.

Equitization is a State policy to mobilize social resources for economic development and firm performance improvement (Loc and Tran, 2016). O'Toole *et al.* (2016) also explain that equitization and privatization are not different when evaluating how privatization impacts operating efficiency in Vietnam. Equitization is only one method of SOEs reform in Vietnam with the main objective of restructuring SOEs ownership.

Thus, with socialism direction, the Vietnamese government has applied gradual equitization policy with slow divestment progress or the government choose to interfere with most of equitized SOEs after equitization in Vietnam. This does not mean that the Vietnamese government has not applied privatization theories in equitization programs

but the government has carefully conducted equitization gradually to avoid any risks of losing state control in public firms.

Comparison between privatization and equitization

Table 2.2 shows a comparison between privatization and equitization and there are not many differences between privatization and equitization.

Table 2.2 Comparison between privatization and equitization

Contents	Privatization	Equitization
Definition	Privatization is known as transferring assets from state ownership to private ownership. The state only keeps some SOEs in key sectors to regulate the economy	Equitization does not mean that the State sells all its assets to the private sector. The State still holds dominant shares of equitized SOEs in many cases with gradual divestment progress.
Objectives	(1) Raise revenue for the State; (2) promote increased efficiency; (3) reduce Government interference in the economy; (4) promote wider share ownership, (5) provide the opportunity to introduce competition; and (6) expose SOEs to market discipline and (7) develop the national capital market.	(1) Restructure SOEs through improving market economy institutions; (2) restructure SOEs for divestment of state capital; (3) restructure SOEs through measures to improve firm efficiency and competitiveness of SOEs
Nature	Full privatization (except for China)	Partial equitization
Divestment	The State just retains some SOEs in key areas such as energy, telecommunication, etc to regulate the economy.	The State still retains state ownership in most of the equitized SOEs after equitization and controls these firms.
The State roles	Use fiscal policies and SOEs as tools to regulate the economy	Use fiscal policies and SOEs as tools to regulate the economy. However, the Government still controls equitized SOEs and develops a market mechanism with the direction of socialism.

Source: Author's data collection

Privatization/ equitization is encouraged in both developed and developing countries to promote wider share ownership and provide the opportunity to introduce

competition to promote economic development. Also, privatization/ equitization helps to expose SOEs to market discipline and develop the national capital market.

Privatization and equitization are a little different in progress and objectives. Developed countries have applied privatization programs to transfer almost all state ownership to the private sector and maintained only some important State corporations to provide public services for their citizens. Equitization term has been used in Vietnam only because the Vietnamese government would like to emphasize the State's role in equitized SOEs after equitization. Equitization does not mean that the State transfers all shares to the private sector but remains dominant shares to interfere and control equitized SOEs after equitization. The Vietnamese government would like to create a regulated market with the direction of socialism. Thus, the equitization progress has been so slow due to gradual divestment based on the equitization nature in Vietnam. However, there are not many differences between privatization and equitization terms in reality. Equitization can be considered and gradual and cautious privatization (Sjöholm, 2006). Thus, privatization theories can explain equitization in Vietnam in general.

2.1.2.2 Methods of privatization/ equitization

Privatization methods

There are common privatization methods, including restitution and sale of state property and mass or voucher privatization (Brada, 1996). Restitution has been the main method of privatizing agricultural land in most eastern European countries. Privatization through the sale of state property includes selling all state property or a part of state property to the private sector. In a program of voucher privatization, vouchers are distributed free or at minimal cost and citizens can easily bid for shares of state-owned enterprises and other assets that are being privatized. This method was applied popularly in most of the eastern and central European countries, the USSR and Mongolia.

According to Megginson (2017a), privatization methods include share issue privatization, voucher privatization, and asset sales. Share issue privatization (SIP) includes IPO and SEO (seasonal public offering). Megginson (2010) examines the

choice between an asset sale and a SIP using a sample of 2,477 privatizations that raised $1.189 trillion in 108 countries over the period 1977–2000. Most privatized enterprises used SIP from 1977 to 2000 (accounted for 62.11% of the total number of privatizations). Countries choose different privatization methods depending on each country's development conditions, privatization goals, privatized enterprises' characteristics, and capital market development (Estrin and Pelletier, 2018).

According to Iwasaki and Mizobata (2018), most transition economies apply MEBOs (Management employee buyouts) as a privatization method. However, it is almost certain that asset sales to strategic investors are quite useful to improve post-privatization firm performance. Li *et al.* (2015) conclude that the share issue privatization (SIP) privatization method helps enterprises improve firm performance, especially in profitability after privatization. Besides, Bachiller (2017) also argues that the privatization method is a determinant of privatized companies' performance. Larger and more profitable SOEs are more likely to be privatized through share issues, while less profitable SOEs tend to be privatized through asset sales. This result is consistent with research works by D'Souza *et al.* (2005), Von Eije and Megginson (2008), Arcas and Bachiller (2010).

Equitization methods

Equitization is a special term applied in Vietnam compared with privatization term in other countries. However, equitization methods are quite similar to privatization methods when there are only two popular methods, including share issue equitization and assets sales. In Vietnam, equitized SOEs have to propose equitization methods to the equitization steering committee for approval in equitization plans. According to Yuen et al. (1996), equitization includes share issue equitization and assets sales. The state can issue new shares or sell directly state assets to the private sector to establish joint-stock companies.

Equitization has been conducted in Vietnam through two main methods, including direct sales or assets sales and share issues (Sjöholm, 2006). Equitization practices have shown that the Vietnamese government has not applied voucher

privatization and restitution methods. Restitution is one privatization method that the property or firm is given back to the old owners (Brada, 1996).

Comparison between privatization and equitization methods

Table 2.3 summarizes a comparison between privatization and equitization methods.

Table 2.3. Privatization and equitization methods

No.	Privatization methods	Equitization methods
1	Share issue privatization Share issue includes IPOs (initial public offerings), SEOs (seasoned equity offerings) and MEBOs (Management employee buyouts)	Share issue equitization Share issue equitization include IPOs (initial public offerings), SEOs (seasoned equity offerings) and MEBOs (Management employee buyouts)
2	Assets sales	Assets sales
3	Restitution	N/A
4	Voucher privatization	N/A

Source: Author's data collection

Thus, there are different privatization/equitization methods in different countries. However, there are two common privatization/equitization methods, including share issue privatization and asset sales. In Vietnam, there are two equitization methods, including share issue equitization and asset sales. Share issue equitization include IPOs (initial public offerings), SEOs (seasoned equity offerings) and MEBOs (Management employee buyouts). Equitized SOEs need to propose equitization plans with equitization methods to the Equitization steering committee for approval. In this dissertation, the author only uses equitized SOEs with IPOs method to evaluate underpricing phenomenon because these firms are listed on the stock market and there are IPOs prices to calculate IPOs underpricing.

2.1.3 Firm performance

According to Megginson *et al.* (1994), Governments often implement privatization programs with the common goal of improving SOEs' firm performance by selling state-owned shares to the private sector. The purpose of privatization is to increase firm profitability, operational efficiency, investment, and output.

Governments are also keen to achieve these goals but still ensure increased labor productivity and workforces.

According to Helfert and Helfert (2001), firm performance can be analyzed through investment, operating, and financial performance. There are many tools for firm performance assessment, including Dupont analysis, Key Performance Indicator (KPIs), and balance scorecard.

Financial performance refers to performing a financial activity or the degree to which financial goals are being or have been accomplished. This definition can be one process measuring firm performance in monetary terms. Financial performance measurement is a measure of how well a firm can use assets from its primary business model and generate revenues. Financial performance also refers to a general measure of a firm's overall financial health over a given period. There are several financial ratios to measure financial performance, including ROE, ROA and ROS.

Operating performance refers to performing the operational activity of certain core operations for an organization or business. Operating performance ratios reveal information about how efficiently that organization uses its resources to generate sales and profit. There are three usual operating performance assessment ratios, including asset turnover, sales/net income per employee (sales efficiency, net income efficiency), and operating cycle[1].

However, Megginson *et al.* (1994), Brown *et al.* (2016), Rakhman (2018) have used firm performance or financial and operating performance terms because these two terms are similar. According to Megginson *et al.* (1994), measures used to assess firm performance should include (1) profitability (including ROE, ROA, and ROS); (2) operational efficiency (Sales efficiency, net Income efficiency); (3) capital investment (Capital expenditures to sales, capital expenditures to assets); (4) output (real sales); (5) employment (total employment); (6) financial leverage (Long-term debt to equity, debt to assets); (7) payment (dividends to sales, dividend payout). Based on the definition by Helfert and Helfert (2001) and an empirical study by

[1] Operating Cycle = inventory period + accounts receivable period.

Rakhman (2018), this dissertation uses the term firm performance instead of financial and operating performance because empirical studies show that they are the same in meanings and measures. There are serval firm performance measures from previous studies as indicated in the Appendix 2.

In conclusion, the firm performance includes investment, operating, and financial performance. Operating performance is performing the operational activity of certain core operations for an organization. Financial performance is performing a financial activity or the degree to which financial goals are being or have been accomplished. Most of the previous empirical studies consider firm performance as operating and financial performance. Financial performance can be measured through profitability, financial leverage and payment while operating performance can be measured by sales efficiency, net income efficiency and total asset turnover.

2.2 Relevant theories

2.2.1 Privatization theories

2.2.1.1 Invisible hand, visible hand and mixed economy theories

Researchers have made a great effort to propose theories to explain privatization's impact on SOEs' firm performance. In 1776, Smith proposed the "Invisible hand" economic theory that individuals want to maximize their profits in a market economy. Their expectations promote the development and consolidation of benefits for the whole community. According to Smith (1817), Governments do not need to interfere with individuals and businesses; Each country's wealth is not due to strict Government regulations but because of business freedom. This idea has prevailed and made many contributions throughout the world during the nineteenth century. Invisible hand theory affected the privatization concept when Governments did not need to control SOEs and private sectors could manage businesses effectively. This is the reason why privatization was popular in many developed countries during this time. According to the invisible hand theory, privatization is necessary and private enterprises can perform well without interference from the State.

From the 1930s to the twentieth century, capitalism developed with highly developed productive forces demanding state intervention for economic regulation. The Keynesian school proposed the Keynesian theory on the role of Government in the economy of a country. The State must maintain its investment to stimulate public and private investment through large investment programs (the state intervention in the economy is necessary; each economy can be based on the self-regulating market mechanism). In 1977, Alfred DuPont Chandler introduced the “visible hand” theory in the textbook titled “The visible hand: The managerial revolution in American business”. Alfred DuPont Chandler used eight propositions to show how and why the visible hand of management replaced the invisible hand of the market forces. These basic proposals are divided into two parts. The first three proposals help Chandler explain the emergence of the modern business enterprise. The remaining five proposals help him explain the continued growth of this type of business. Modern enterprises emerged when management hierarchies can monitor and coordinate the activities of several business units more effectively than market mechanisms. It continues to grow as managers become more and more professional and skilled. Alfred DuPont Chandler explained that “once a managerial hierarchy has been created and had successfully carried out its functions of administrative coordination, the hierarchy itself became a source of power, permanence and continued growth”. Visible hand theory encourages government interference and managerial hierarchy for business growth. After visible hand theory appeared, Governments still needed to control SOEs and they designed effective managerial hierarchy within SOEs. According to this theory, enterprises can not perform well without state control and interference. When the supply side has more goods than the demand side needs, there is a surplus and unbalanced between both sides. This theory does not encourage governments to privatize SOEs because SOEs can perform well under State control.

P.A Samuelson proposed the theory of mixed economy theory to overcome the limitations of the invisible hand theory and the Keynesian theory on the Government's role in a country's economy. "Mixed economy" is the combined

economy in which enterprises with private ownership and state ownership are affected by the market mechanism and the state regulation. Privatization programs have spread worldwide, including developing countries and developed countries after 1987. The mixed economy theory can explain the privatization nature in China and Vietnam. China conducted privatization programs to create a mixed economy to encourage the private sector but try to maintain state interference in some important privatized SOEs and central SOEs. Privatization programs in Vietnam mainly learned from privatization experience in China to encourage private sector development while maintaining pure SOEs or state control in some essential equitized SOEs. According to mixed economy theory, privatization is also necessary but the State should control or remain dominant shares in some cases to orientate the economy.

Also, economists still argue which theories explain the State's role in regulating the economy suitably at present. The unanswered question is whether the Government should privatize all SOEs or keep some key enterprises. Economists in favor of privatization explain that the State should only retain some key economic enterprises to regulate the economy. Therefore, these economists have encouraged the privatization process in countries, especially in developing countries. Vietnamese government applies mixed economy theory for economic development and this is the reason why equitization in Vietnam is gradual to create a mixed economy where public and private sectors are present with the development direction of communism.

2.2.1.2 New public management

New public management (NPM) has its origins in public-choice theory (Gruening, 2001). Tullock and Buchanan (1972) proposed a public choice theory to explain individuals' aims and information about their situations. This approach assumes that individuals pursue their aims and act according to their interests. Because individual preferences and interests of individuals are central to this approach, the theory can explain why a free individual would willingly agree to structures of political institutions and their outcomes (Tullock and Buchanan, 1972).

NPM was applied in the United Kingdom under Prime Minister Margaret Thatcher and in the municipal governments in the U.S in the late 1970s and early 1980s. "New Public Management" is the label applied to this set of innovative reforms (Savas, 2000).

According to Gruening (2001), most researchers agree that NPM has some characteristics including budget cuts, vouchers, accountability for performance, performance auditing, privatization, customers (one-stop shops, case management), decentralization, strategic planning and management, separation of provision and production, competition, performance measurement, changed management style, contracting out, freedom to manage (flexibility), improved accounting, personnel management (incentives), user charges, separation of politics and administration, improved financial management, more use of information technology. Privatization is one important characteristic of NPM. The United Kingdom under Prime Minister Margaret Thatcher has conducted a privatization program to improve firm performance of SOEs and develop a market mechanism.

According to NPM, privatization helps privatized SOEs restructure ownership and change control mechanisms to improve firm performance for better services to citizens. Privatization programs have almost finished in developed countries but there are still some developing countries with incomplete privatization programs, especially in Vietnam. Privatization requires a strong enough capacity of private entities to “sell” public services to citizens. The capacity of the private sector, as well as the benefits derived from public service provision, are not attractive to them. Although the NPM model applied in developing countries has had to be adjusted, the privatization scale is still limited, so it does not make a significant contribution to the national GDP.

2.2.1.3 Efficient market theory

The French mathematician Louis Bachelier first introduced the concept of an efficient market. Then, Eugene F. Fama reviewed empirical studies and developed the efficient market theory presented in his doctoral thesis in 1970. An efficient

market is one in which security prices at any time can fully reflect all available information. In this case, firms can make any decisions based on available information and investors can not take advantage of historical data related to firms and securities. The purpose of the efficient market theory is to provide a basis for explaining how security prices move when new information about a business becomes available. There are three efficient market forms, including weak–form efficiency, semi-strong form efficiency and strong-form efficiency (Fama, 2021).

The weak–form efficiency has assumptions that security prices reflect all historical trading data, trading volume and stock returns. Historical data are publicized and investors find it easy to access all of these data. Investors can use historical data to make investment decisions. The semi-strong form efficiency assumes that all historical information and other publicly available information (announcements of stock splits, annual reports, new security issues, etc.) about firms and securities are widely publicized and all historical data reflect security prices. In this case, technical analysis can not help investors get returns when investing in securities. The strong form efficiency assumes that all information related to securities, including internal information or non-publicly available information reflects security prices. There is no technical analysis to get security returns for investors. The efficient market theory suggests that Government intervention should not exist within the market because stock prices are always being traded at market value and the stock prices reflect all available information. Deregulation should be applied to ensure efficient market forms. Governments just remain essential SOEs firms to orientate economies. In Vietnam, most equitized SOEs do not register for trading in the stock market and it is difficult to establish an efficient capital market in Vietnam. Investors can not only base on historical data to make investment decisions. The Vietnamese government still controls most of equitized SOEs after equitization in Vietnam. Equitization does not go with deregulation in Vietnam, so it is difficult to achieve efficient market forms.

Up to now, some economists have developed the behavioral finance theory to forecast security prices. Behavioral finance theory has replaced efficient market theory and explained that psychological factors impact investor behavior in financial markets.

2.2.1.4 Welfare Economics

Welfare economics theory was developed in the 1920s typically by the English economist Arthur Cecil Pigou. Welfare economics is a branch of economic theory that is concerned with the desirability of society. The theory of welfare economics is used to distinguish cases in which the market is considered to be efficient to produce desired outcomes. The basic theorem states that as long as the economy is perfectly competitive, i.e. producers and consumers accept prices, then, under certain conditions, the economy will inevitably move to a Pareto efficient way of allocating resources.

However, there are two limitations of the basic theorem. First, the fundamental theorem of welfare economics holds only in perfect competition. However, the economy, in reality, does not always guarantee this condition. Therefore, when market imperfections appear, Pareto efficiency is not guaranteed and government intervention is required. Second, the theorem is studied in the context of a closed economy. However, when the economy participates in international trade, especially in the current globalization trend, economic efficiency is not only considered static but must be placed in a dynamic relationship. Therefore, the government also has a particularly important role in representing national interests in international negotiations. The basic theorem explains that state intervention is necessary to allocate suitable resources for the public sector and private sector. Thus, privatization or equitization is an important method to reallocate resources for the economy to achieve a Pareto efficient way. The State can still maintain some SOEs in key industries, such as energy, telecommunication, etc to regulate the economy. Governments also allocate and control the supply of labor and goods by applying some policies, such as tax incentives or tax cuts and trade barrier removal policies, some benefit cuts and privatization (Laffer, 1981).

Gakhar and Phukon (2018) have summarized most empirical studies related to privatization and firm performance. The authors explain that most empirical studies have explained how privatization can improve firm performance but indicated that privatization has greater meaning in creating social welfare for economies.

2.2.1.5 Theory of Competitive Advantage

The theory of Competitive Advantage is derived from explaining competitive advantages at the industry level and then developing into competitive advantages at the national level. Porter (1990) represents this theory and refers to competition at the industry level or national level. According to Porter (1990), the competitive nature and competitive advantage resources vary widely among industries or even in small segments within the same industry. Factors that affect any industry's competitiveness include human resources, tangible resources, knowledge, finance, and architectural resources. As a result, businesses in different competing industries will face different competition levels, which will affect their firm performance. Sheshinski and López-Calva (2003) argue that firms in highly competitive industries (not essential industries) will have significant performance improvement and tend to operate more efficiently. In other words, if privatized firms are in highly competitive sectors, their firm performance after privatization will be much better than those in less competitive industries.

In conclusion, invisible hand, visible hand and mixed economy theories have different points of view on how privatization impacts firm performance and the State's roles in the economy. The new public management (NPM) explains that privatization helps privatized SOEs restructure ownership and change control mechanisms for firm performance improvement and better service provision to citizens and customers. The efficient market theory also supports the concept that privatization can improve firm performance because of its advantages. The theory supports the concept that Government intervention should not exist within the market and privatization can be applied for State intervention reduction or deregulation. Welfare economics theory explains that privatization is an important method to reallocate resources for the economy to achieve a Pareto efficient way.

However, Vietnam has regulations that enterprises belong to 20 industries that are exclusively provided by the state and are not equitized (Decree 94/2017/ND-CP). With a lot of state intervention, it is difficult to achieve efficient Pareto resource allocation in Vietnam. Finally, the theory of competitive advantage competition can affect their firm performance and privatized SOEs in different industries can improve firm performance dissimilarly.

2.2.2 Underpricing theories

The Market Feedback Theory was first proposed by Sherman in 1992. The theory explains that underwriters often underprice IPOs to attract investors participating in IPO deals. After setting a low price, underwriters wait for investors' feedback to determine the average IPO price. Benveniste *et al.* (2008) state that there is underpricing phenomenon when businesses set low IPOs and investors are likely to get IPO first-day returns when these businesses are listed in stock markets.

In addition, Welch (1989) proposes the signaling theory to explain the underpricing phenomenon that firms wishing to issue successful IPOs often signal investors through underpricing their IPOs. Since then, investors tend to get the first-day returns when the companies officially list their shares on stock markets. Also, Allen and Faulhaber (1989) prove that this theory can explain the underpricing phenomenon of IPOs in different contexts. Previous studies have demonstrated that signaling to investors about undervaluing IPOs helps investors actively participate in IPOs investment to achieve high IPOs initial returns. This underpricing signal helps companies issue shares successfully and improve their operational efficiency through diversification of ownership and new control mechanisms after IPOs.

The divergence of opinion theory was first proposed by Miller (1977), suggesting that investors often choose IPO investment because they are subjective about the future cash flow situation and the future growth rate of enterprises. Optimistic investors tend to set higher values of IPOs than pessimistic investors when they are unsure about the value of IPO shares. Later, information about corporate performance and market information becomes fully transparent after

listing, the divergence of opinions of subjective and pessimistic investors will be narrowed, leading to a long-term decline in the price of IPOs.

2.2.3 Listing related theories

In other countries around the world, firms are listed right away after privatization or IPO. Those theories explain why firms go public, including life cycle and market-timing theories. According to Ritter and Welch (2002), life-cycle theories explain the decision why firms go public and first proposed by Chemmanur and Fulghieri (1999). This author argues that firms choose to go public to take advantage of diversifying ownership structures. After going public, firms will have many owners who are shareholders with stricter supervision mechanisms, from which firms operate more effectively than in the previous period. In the early days of establishment, firms are often small with private ownership, but they choose to go public to raise capital for sustainable growth later. Maksimovic and Pichler (2001) argue that the higher the share price that one firm issues to the public, the more competitive that firm is. Public offering of shares also helps firms have many advantages, especially when they are the first ones in the industry going public.

Market-timing theories also claim that the decision to go public is only done at an appropriate time. Lucas and McDonald (1990) have developed asymmetric information theory and explain that firms only go public when their value is assessed by the market and is not undervalued. According to Choe *et al.* (1993), firms avoid going public when there are not many good firms going public at that time, because there may be unintentional investors who will underestimate all of them in that period. Thus, most theories only explain why firms go public in developing countries because there is no case of listing delay in these countries. Firms after equitization or IPO in Vietnam are often not listed immediately on the Vietnamese stock market. Since then, investors in IPO have to wait a long time to receive initial abnormal returns when they invest in these stocks. In Vietnam, firms after equitization through IPO often do not immediately list but focus on the continuous operation until they find it necessary to conduct listing to trade on the stock market. The above-related theories may still be used to explain the listing status of firms in Vietnam, as these firms will begin to

offer stocks extensively to the public once they are listed on the Vietnamese stock market.

2.3 Empirical Evidence

2.3.1 The impact of privatization/equitization on firm performance of privatized/equitized state-owned enterprises compared with non-participating state-owned enterprises

2.3.1.1 Empirical studies examine the impact of privatization on firm performance changes

Most of the empirical studies in developed countries have applied a pre-post comparison method to examine the impact of privatization on firm performance. Dewenter and Malatesta (2001) compare the firm performance of 63 large-scale enterprises in the Fortune 500 report from 1981 to 1993, also confirm a significant increase in profitability and a decrease in financial leverage and labor after privatization. D'Souza *et al.* (2005) have similar results when researching in developed countries. According to Harper (2002), privatization does not help SOEs to be more effective in profitability, productivity, and ability to utilize capital in the Czech Republic in general. Rakhman (2018) argues that partially privatized SOEs perform at least as effectively as private firms in 13 consecutive years according to returns on asset (ROA), cash flows from operations (CFO), and asset turnover (ATO) in Indonesia. Cuervo and Villalonga (2000) explain that the public choice theory only explains the average level of improvement in firm performance measures, not explaining the variations of performance measures between pre-and post-windows.

Brown *et al.* (2016) use a data set of 70,000 firms in five East European economies and find that privatization raises profitability, productivity, and growth by about 5–12% on average, but with substantial variation across countries and time. Arcas and Bachiller (2010) examine the role of organizational changes and contextual factors in explaining European privatized firms' operating performance. Smaller and non-regulated firms and companies privatized by public offer perform better than larger, regulated, and privatized by private sale companies. Also, privatized Eastern European companies are less profitable than privatized companies from other

European countries. Privatization can help privatized SOEs improve performance after privatization (Mager and Jesswein (2010). Gong *et al.* (2012) focus on the impact of privatization on efficiency and performance in developing countries and the research results show that privatization could bring efficiency gains in airport and seaport cases. Privatization is necessary for China because marketized state-owned enterprises outperform firms controlled by the Government, indicating that partial privatization of state-owned Chinese firms improves corporate governance and firm performance (Chenet *al.*, 2008; Z. Huang and Wang, 2011; Kang and Kim, 2012; Rousseau and Sheng, 2008; Wang, 2009).

However, Aussenegg and Jelic (2007) use a data set of 166 companies: 42 from Poland, 39 from Hungary, and 85 from the Czech Republic and proved that privatized firms experience no improvement in profitability, capital investments, efficiency, and output, a significant drop in employment, as well as a significant increase in leverage. Tatahi (2013) argues that ownership has no relationship with firm size and performance in Bulgaria. Moreover, it is not an influential aspect of corporate performance because it takes up a smaller area of common variance shared by all involved variables. Alipour (2013) explains that privatization does not positively affect the profitability (ROS, ROE, and ROA) of the listed firms on the Tehran Stock Exchange; instead, the effect has been negative. Privatization does not improve firm performance after privatization (Hakro and Akram, 2009; Oqdeh *et al.*, 2011).

Wei *et al.* (2003) find an increase in production, sales efficiency, and a reduction in financial leverage in China. However, the research results show that enterprises do not increase significantly in profit after privatization in China. After privatization in China, there is still much state ownership, so it is unlikely that profitability will increase in the first period after privatization (Chen *et al.*, 2006). Dewenter and Malatesta (2001), Huang and Song (2005) also report that net sales increased after privatization due to China's economic growth in the same period. Fan *et al.* (2014) conclude that a Government's reluctance to relinquish could have significant negative consequences on corporate governance and firm performance (Gan, 2009). Tu *et al.* (2013) explain a political connection after privatization in China. The research result

shows a significant relationship between politics and privatization in China (Yu, 2013).

Arocena and Oliveros (2012) also confirm no significant difference in efficiency between privatized SOEs and private SOEs in the same period. However, there is a significant improvement in privatized SOEs' efficiency after privatization, while there is no improvement in this aspect of private firms in Spain. Amess and Roberts (2007) find that state-owned corporations are more productive than non-privatized SOEs. The results also show a significant increase in turnover per person after privatization.

Mckenzie and Keneley (2011) conclude that privatized institutions perform quite similarly to private peer institutions both before and after privatization in Australia. Jiang *et al.* (2009) conclude that privatization does not help state-owned enterprises operate more effectively, especially when compared with non-privatized firms in the same period. Profitability and revenue of privatized SOEs fall slightly after privatization. Li *et al.* (2015) also apply a without-without comparison method to evaluate the impact of privatization on firm performance of 248 Chinese SIPs from 1999-2009 compared with privately-owned firms. Research results show that privatized SOEs can improve profitability (ROS and EBIT/Sales).

Appendix 1 summarizes empirical studies on the privatization impact on firm performance changes

Conclusions: Researchers have inconsistent conclusions about the impact of privatization on firm performance in different countries and industries.

Research methodology: Since Megginson *et al.* (1994) first proposed to use the pre-post comparison method and seven firm performance measures, the following empirical studies have focused on quantitative research methodology, and they identify the changes in mean values with t-Test and Mann Whitney U test for median changes or proportion of enterprises adopting changes. Most of the previous studies use pre-post privatization windows to measure changes in mean and median values of firm performance measures through t-Test and Mann–Whitney U test (generally from two to three years before privatization and from two to ten years after privatization). Chosen timelines are based on sample size and different research contexts.

Limitations: The major limitation of previous studies is that most of them do not use regression and with-without comparison approaches to assess how privatization impacts firm performance after privatization. Studies by *Megginson et al.* (1994), Dewenter and Malatesta (2001), examining the impact of privatization on firm performance only focus on the pre-post comparison method to compare changes in firm performance measures. However, they do not develop research models to present the direct impact of privatization on privatized enterprises' firm performance. The study by Carlin and Pham (2009) only considers the listing year as the base year of privatization for comparison. Some studies do not consider comparison in firm performance between privatized enterprises and non-privatized SOEs or between privatized enterprises and private enterprises in the same period to see whether privatization can help privatized enterprises operate more efficiently after privatization or not.

2.3.1.2 Empirical studies examine the equitization impact on firm performance of equitized state-owned enterprises

In Vietnam, Dang *et al.* (2021) summarize SOEs reform by progress and challenges. Equitization is one of the SOEs' reform forms. Loc *et al.* (2006) state that firm performance can be improved after equitization in Vietnam, including profitability, operating efficiency, and equitized SOEs and equitized firms tend to reduce leverage and labor after equitization. Nguyen *et al.* (2017) conclude that equitization has created new land and property development opportunities. Vo *et al.* (2013) explain that only organizational integration significantly affects equitized firms' performance. Equitized firms with less state ownership perform better than those with more state ownership in Vietnam. Ineffective firm performance is because the Vietnam Government still controls a majority of equitized SOEs after equitization. Equitization also helps develop the private sector in Vietnam (Quy, 2019). Research works by Pham (2017), and Pham and Nguyen (2019) suggest that post-equitized enterprises increase profitability (ROA, ROE) and real sales but decrease operating efficiency because managers want to increase capital to expand operation after equitization. Thus, studies in the world and Vietnam also show

inconsistencies in SOEs' firm performance after equitization. However, property rights theory and agency theory, and most studies believe that equitized SOEs improve firm performance. Furthermore, Hoa (2016) identifies equitization policies for Vietnamese equitized state-owned enterprises in the textile industry. Incentive equitization policies can promote equitized SOEs to participate in the equitization program but create an unfair competitive environment for other non-equitized SOEs. Large-scale SOEs usually have difficulties in asset pricing to participate in an equitization program (Linh, 2017).

Loc and Tran (2016) have similar findings with the study by Loc et al. (2006) in Vietnam. Firms have a higher ROE, mainly due to leverage than private firms because equitized firms are more easily to increase debt (Hung *et al.*, 2017). However, equitized firms perform better after equitization, especially profitability (Tran *et al.*, 2015). Equitized SOEs have a significant improvement in profitability, operational efficiency, a reduction in the number of employees, and leverage after equitization in Vietnam (Nhan and Son, 2017). Suu *et al.* (2021) find that State ownership after equitization positively impacts profitability (ROA) in Vietnam.

Conclusions: Privatization in China also has many cases where the State still holds several shares in enterprises after privatization in some industries and key corporations. This is a similar characteristic in the privatization process between China and Vietnam. Vietnamese equitization is similar to privatization compared with other countries. Most of the previous studies have shown that equitization can help equitized SOEs improve firm performance after equitization in Vietnam.

Research methodology: Most of the previous empirical studies have adopted a pre-post comparison method and regression method to examine the impact of equitization on firm performance, while few empirical studies adopt a with-without comparison method. Loc and Tran (2016), Nhan and Son (2017) use the with-without comparison method with a combination of PSM and PSM-DID techniques while previous studies focus only on the pre-post comparison method.

Research limitations: Most of the previous studies have mainly used the pre-post comparison method proposed by Megginson *et al.* (1994) and have mainly identified

changes in mean values through the t-Test and Mann-Whitney U test for median changes or proportion change (Huang and Song, 2005; Huang and Wang, 2011). The studies by Loc and Tran (2016), Nhan and Son (2017) use the with-without comparison method with the PSM technique using caliper or radius matching using two control variables, including firm size and establishment year to determine the propensity scores are not enough and can lead to the wrong comparison. This is why the results are difficult to compare measures between treatment and control groups accurately. From the empirical studies above, the author summarizes a comparison table about these empirical studies.

Table 2.4 Comparision between empirical studies examining the impact of privatization on firm performances changes with and without considering non-participating firms

No.	Contents	Without considering non-participating SOEs	Considering non- participating SOEs
I	Empirical results		
1	Research contents	There are different views on the impact of privatization on privatized enterprises' firm performance.	Inconsistent results about the impact of privatization on firm performance
2	Research methodology	Pre-post comparison method and regression method	With-without comparison method and regression method
3	Statistical techniques	The changes in mean values with t-Test and Mann Whitney U test for median changes or proportion of enterprises adopting changes Statistical tests for regression models	Statistical tests for regression models Probit regression, t-Test and z-Test for average treatment effect
4	Measurement	Most of empirical studies apply seven measures, including (1) profitability (ROE, ROA, and ROS); (2) operating efficiency (sales/number of employees, net income/number of employees); (3) capital investment (capital expenditures/sales, capital expenditures / total assets); (4) output (nominal sales/consumer price index); (5) employment	Most of these studies also apply seven measures, including (1) profitability (ROE, ROA, and ROS); (2) operating efficiency (sales/number of employees, net income/number of employees); (3) capital investment (capital expenditures/sales, capital expenditures / total assets); (4) output (nominal sales/consumer price index); (5) employment (total number of employees); (6) leverage (total

No.	Contents	Without considering non-participating SOEs	Considering non- participating SOEs
		(total number of employees); (6) leverage (total debt/total assets, long-term debt/equity); and, (7) payout (cash dividends/sales, cash dividends/net income).	debt/total assets, long-term debt/equity).
II	Research limitations		
1	Research methodology	The major limitation of previous studies is that most of them do not use regression and with-without comparison approaches Some international studies do not consider comparison in firm performance between privatized enterprises and non-privatized SOEs or between privatized enterprises and private enterprises in the same period	Li *et al.* (2015) use the with – without comparison method but do not consider industry and establishment years. Minor et al. (2018) do not consider the impact of equitization on firm performance in Vietnam. Some studies have a panel data approach and consider some variables as fixed effects.
2	Statistical techniques	These studies do not apply statistical techniques for average treatment effect	The studies by Loc and Tran (2016), Nhan and Son (2017) do not perform robustness tests for the average treatment effect.
3	Measurement	These studies do not consider inflation when calculating operating efficiency. The study by Carlin and Pham (2009) only considers the listing year as the base year of privatization for comparison.	The studies by Loc and Tran (2016), Nhan and Son (2017) use the with-without comparison method with the PSM technique using caliper or radius matching using two control variables, including firm size and establishment year to determine the propensity scores is not enough and can lead to the wrong comparison. Studies in developing countries and Vietnam only consider the impact of privatization on firm performance in a certain period, while equitization in Vietnam is divided into three phases with a different number of equitized firms and firm size. These studies do not consider inflation when calculating operating efficiency

Source: Author's data collection

After summarizing empirical studies from developed and developing/transition economies, the author has figured out that few recent empirical studies applied the with-without comparison method, such as works by Tran *et al.* (2015), Loc and Tran (2016). This dissertation applies the research model proposed by Tran *et al.* (2015), Loc and Tran (2016) to identify propensity scores when applying the with-without comparison method. Most previous empirical studies have applied the multiple regression method to assess the impact of privatization on firm performance. Huang and Xiao (2012) summarize previous models to propose theoretical regression models explaining the impact of privatization on firm performance through a state ownership change. In this dissertation, the author applies regression models proposed by Rakhman (2018) and Huang and Xiao (2012) because most previous studies also applied similar models with some minor modifications in control variables.

2.3.2 The impact of equitization on firm performance of equitized state-owned enterprises compared with non-equitized state-owned enterprises by average state ownership rates after equitization

Deregulation is a debatable topic which exists for several decades. There are some theories supporting deregulation, including the invisible hand theory, the new public management theory and efficient market theory. However, the mixed-economy theory requires state interference to monitor economies in some contexts. According to the public choice and the new public management theories, state intervention should not exist within firms to create managers' free choices for effective decisions. The new public management theory encourages Governments to apply privatization programs for a reduction in state interference within firms, leading to deregulation. According to the mixed economy theories, Governments should regulate economic development where private firms and public firms can operate for economic development. Experiences from privatization programs in developing countries show that governments should not interfere or control privatized SOEs after privatization, governments only need to remain some public firms or corporations in key sectors, such as telecommunication, energy, etc. An efficient market explains that government interference does not create efficient capital markets. Eastern European

countries engage in speedy and mass privatization of state-owned enterprises (Cao, 2000). Voucher privatization was applied through mass privatization and the Russian government remains some SOEs to regulate the economy. The Chinese government applied for partial privatization programs, especially for some important enterprises in key areas, such as telecommunication, energy, etc. The Vietnamese government also applied similar policies with the Chinese government when using partial equitization programs. The State sill control and remain high ownership within equitized SOEs in Vietnam. The Vietnamese government has slow state divestment in equitized SOEs in Vietnam, leading to difficulties achieving deregulation.

Some empirical studies in developed and developing countries have indicated that privatization helps privatized SOEs improve firm performance due to state ownership reduction after privatization and deregulation or state control removal (Boubakri *et al.,* 2008; D'Souza *et al.*, 2005; Ochieng and Ahmed, 2014; Alipour, 2013; Oqdeh and Nassar, 2011). Empirical studies in China also show that state ownership reduction can not help privatized firms improve firm performance (Wei *et al.* (2003). However, the Chinese Government's reluctance to relinquish could have a significant negative impact on corporate governance and firm performance (Fan *et al.*, 2014). Huang and Xiao (2012) indicate that privatization leads to a decrease in state ownership after privatization. State ownership reduction helps privatized SOEs improve firm performance in terms of profitability and operating efficiency.

Some empirical studies in Vietnam also prove that state ownership reduction through equitization helps firm performance improvements (Loc *et al.,* 2006); Loc and Tran (2016). Hung *et al.* (2017) indicate that equitization impacts the stock market and firm performance. Loc *et al.* (2006) find that state ownership reduction helps equitized SOEs improve firm performance after equitization and the author concludes that equitization can enhance the firm performance of equitized SOEs in Vietnam. However, Loc *et al.* (2006) classify data into firms less than 30% of state ownership and firms above 30% of state ownership after equitization. This classification does not tell us how state control or interference impacts on firm performance of equitized SOEs after equitization. Loc and Tran (2016) also find

similar results when concluding that equitization can enhance the firm performance of equitized SOEs.

Based on theoretical debates, studying how deregulation through equitization programs impact firm performance in Vietnam is very essential. Empirical studies focus on changes in state ownership after privatization programs to measure deregulation. However, most of the empirical studies have not considered non-privatized SOEs when evaluating the impact of privatization on firm performance. To answer whether deregulation or state control reduction can help equitized SOEs improve firm performance compared with non-equitized SOEs, this study can classify samples into two groups based on average state ownership after equitization (below 20%, 20% up to 30%, 30% up to 50%, 50% up to 65% and above 65%).

2.3.3 The impact of equitization on firm performance of equitized state-owned enterprises compared with non-equitized state-owned enterprises according to industry groups

The theory of competitive advantage indicates that firms operating in different competitive industries have different competitive advantages, leading to affect firm performance. Megginson *et al.* (1994) also suggest an increase in privatized enterprises' real sales and firms in different industries will have different gains after privatization. Porter (1990) argues that firms are more involved in the multi-sectoral competition after privatization, and this means that industry competitiveness will help increase sales for enterprises and employees' incomes. This improvement will have a positive impact on their suppliers, customers, and other industries.

Therefore, each industry's characteristics and competitiveness will determine the firm performance of enterprises after privatization. This is an unavoidable factor that affects the firm performance of enterprises after privatization. In this dissertation, the author applies this theory to explain why it is necessary to apply industry as one variable in the probit model identifying in between equitized SOEs and non-equitized SOEs. The author also applies industry as one control variable in the regression model. The competitive advantage theory can explain equitized SOEs in different industries can perform differently after equitization (Bachiller, 2012).

Rakhman (2018) classifies Indonesian privatized SOEs and private firms into five groups of property, mining, infrastructure, consumer goods and basic industry. There are different firm performance improvements according to industry groups and firms in the mining industry have the largest firm performance improvement compared with other industries. Bachiller (2017) performs a meta-analysis of privatization impact on firm performance and concludes that industry differences can explain why privatized firms have different firm performance improvements in both developed and developing countries. Sakr (2014) applies a pre-post comparison method to evaluate how privatization impacts firm performance in Egypt. However, there is not a consideration of different privatization impacts on firm performance according to industry groups in this study. Kang (2012) applies panel data to evaluate the impact of privatization through state ownership changes on firm performance in China without considering the industry. Estimation methods in pannel data usually ignore constant variables like industry. Huang and Xiao (2012) do not consider different privatization impacts on firm performance according to industry groups in a simple model of privatization in transition economies. Alipour (2013) applies industry as one dummy variable to evaluate how privatization impacts firm performance in Iran (14 industries). According to Arcas (2010), firms in regulated industries are less profitable than non-regulated firms. There are 11 industry groups, including construction, energy, holdings, manufacture of food and tobacco products, manufacture of basic metals, transport, computer and related activities, manufacture of petroleum, telecommunications, wholesale trade and other sectors (Arcas, 2010).

Jiang (2009) considers firms in the manufacturing industry when evaluating the impact of privatization in China and finds that firms in the manufacturing industry improve firm performance compared with the total sample. Pham (2019) evaluates how equitization impacts firm performance in Vietnam considering industry groups as dummy variables to evaluate the impact of equitization on firm performance. Loc (2006) classifies the industry factor as two groups of service and others. There are differences in firm performance improvements of equitized SOEs after equitization in Vietnam (Loc, 2006). Pham (2017) has not applied industry groups to measure the

impact of equitization on firm performance in Vietnam through a pre-post comparison method. Hung *et al.* (2017) also apply this approach without considering industry groups for firm performance improvements after equitization in Vietnam. Loc and Tran (2016) analyze the impact of equitization on firm performance by equitization years only and do not consider industry groups. Tran (2015) also considers the industry as one control variable when evaluating the impact of privatization on firm performance in Vietnam. However, the author applies estimation methods for panel data and eliminates industry factor effect on firm performance changes of privatized SOEs.

Thus, most of the above empirical studies have applied the pre-post comparison and regression method to consider the impact of privatization on firm performance according to different industries. This dissertation considers the impact of equitization on firm performance according to different industries using a with-without comparison method through propensity score matching. Considering both equitized and non-equitized SOEs helps the equitization impact evaluation more appropriately.

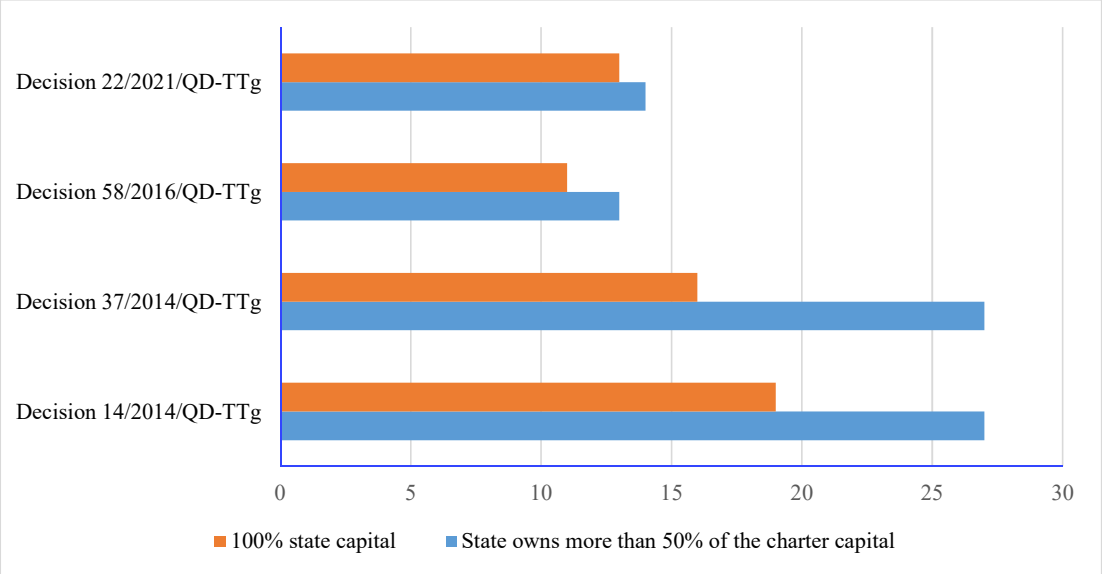

Figure 2.1. Adjustment to reduce the number of industries, sectors that the State holds 100% authorized capital or dominant shares

Source: General statistics office of Vietnam (VGSO)

The Vietnamese government has issued a list of firms in specific industries when equitization in different periods. At present, the Government has issued the Decision 22/2021/QD-TTg on classification criteria of State-owned enterprises, enterprises with state capital implementing ownership transfer, restructuring and divestment in the period 2021-2025.

According to Figure 2.1, the number of industries that the State owns more than 50% of the charter capital tends to decrease from 27 (Decision 14/2014/QD-TTg) to 13 (Decision 58/2014/QD-TTg). Also, the number of industries that the State owns 100% of charter capital tends to decrease from 19 (Decision 14/2014/QD-TTg) to 11 (Decision 58/2014/QD-TTg). However, the State has increased the number of industries in both cases, indicating that there is a stricter state control tendency in SOEs. Thus, there is a gap that needs to explain which industry groups that the State should still maintain state ownership and propose an appropriate equitization selection criteria in industry consideration.

2.3.4 Incentive policies for privatization programs and firm performance differences between listed and unlisted firms

2.3.4.1 The impact of incentive policies on firm performance of privatized state-owned enterprises

Countries apply fiscal policies that regulate the economy as a whole, rather than directly interfering with privatized SOEs. According to Adam Smith's invisible hand theory, the economy can adjust itself and does not need state regulation. The visible hand theory and the mixed economy theory also suggest that the state uses macroeconomic policies to regulate the economy, rather than using incentive policies to interfere in firm operations. The efficient market theory also proposes that the security prices reflect all information related to firms or securities. There should not be any state interference in efficient markets. Governments focus on controlling the supply of labor and goods by applying some policies, such as tax incentives or tax cuts and trade barrier removal policies.

In Russia, there are some incentive policies for privatized SOEs, including budgetary subsidies, trade protection and financial credits. These policies changed

dramatically in different privatization phases and privatization policies (Boycko *et al.*, 1994). Also, the Chinese government has had tax incentive policies for businesses to attract foreign investment in technology, environment-friendly sectors, and tax incentives for businesses in certain localities. There is no direct tax incentive for privatized firms, like in Vietnam (Cao, 2000). In Vietnam, the Government issued Decree 164/2003/ND-CP on December 22rd, 2003, detailing the Law on Enterprise Income Tax (CIT). Equitized SOEs from 2003 to March 2007 have corporate tax reductions of 100% after two equitization years and 50% for the third and the fourth years after equitization. Also, the Government issued Decree 51/1999/ND-CP indicating that newly established enterprises rent more State land to expand production, and businesses had incentives on land lease. However, according to the Government's Decree 142/2005/ND-CP issued on November 14, 2005, equitized state-owned enterprises were not entitled to land rent incentives any longer. Although the incentive policies are invalid at present, there are still no empirical studies evaluating how these incentive policies impact firm performance participating in equitization programs. Most of the privatization supporting theories (invisible hand theory, mixed-economy theory and efficient market theory) explain that the States/ Governments should not interfere in firm operations. Especially, efficient market states that firm values and security prices reflect all available information and historical information, there is no need for state interference in equitization/ privatization programs.

Most of the previous studies have not examined how incentive policies can impact the firm performance of privatized/equitized SOEs. There are some empirical studies on the impact of tax incentives on firm performance and investment. Liu et al. (2019) indicate that location-based tax incentives impact entrepreneurial activities. Due to the global financial crisis in 2008, the Chinese government applied value-added tax (VAT) reform by allowing the deduction of firms' purchases of fixed assets from the VAT bases (Liu and Mao, 2019). Tax incentives can be a good policy for governments to harmonize and boost economic development. However, tax incentives were only applied for equitized SOEs, leading to an unfair competition environment in Vietnam. Sidorova and

Tikhonova (2017) have studied tax reform in Russia, including four taxes: value-added tax, corporate income tax, personal income tax, and insurance premiums. Tax reform or tax rate changes can directly impact firm performance and investment in Russia. However, tax incentives can lead to stagnation in financial market development (Radygin, 2014). According to Aslund (2013), privatization incentive policies positively affect the firm performance of privatized SOEs, but this is likely to lead to unfair competition for enterprises (compared with non-privatized SOEs). The U.K government applies tax incentives for research and development (R&D) projects or firms. Research and development tax incentives can help firms increase R&D development and the number of R&D employees within firms in the U.K (Guceri, 2018). Unlike research models using panel data proposed by Rakhman (2018), this dissertation applies repeated-cross sectional data to apply dummy variables, such as tax incentives and listing.

2.3.4.2 Firm performance differences between listed and unlisted firms after privatization

Currently, Vietnam has two official stock exchanges for listed firms including Hochiminh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX). The number of officially listed firms now includes 754 in 2020 (World Bank, 2020). Although the Vietnamese Government has many policies on encouraging firms to list on official stock exchanges after IPO, the number of listed firms is still very limited. Currently, equitized SOEs do not comply with regulations on listing shares on the stock market in Vietnam although the Government has issued many specific regulations on listing time. According to Decision 50/QD-XPVPHC of the State Securities Commission issued on January 12, 2018, on the sanctioning of administrative violations against Nam Dinh Textile and Garment Joint Stock Corporation, the State Securities Commission of Vietnam has fined the company VND 200 million because the enterprise registered for trading and listed securities over 9 months after the allowable listing deadline as regulated. In addition, the State Securities Commission issued Decision 26/QD-XPVPHC on January 13, 2020 on the administrative sanction of Thuan Phuoc Fishery and Trading Joint Stock Company of VND 350 million because

the company registered for trading and listing of securities overdue for more than 12 months. In addition, IPO investors in Vietnam are still not interested in investing in IPOs because investors are uncertain about the IPO initial returns due to a long listing delay. Therefore, IPO auctions in recent years have not achieved good results, typically the IPOs of Ba Ria - Vung Tau Province Construction and Urban Development Company sold only 656,400 shares/16,408,300 shares at the end of November 2018 and there were no foreign investors participated.

According to the efficient market theory, firms need to participate in stock markets for a transparent financial market and the state should not intervene to change stock price fluctuations. However, Vietnam's stock market has not yet reached the low-form efficient market.

In developed countries, firms do not delay listing like in China and Vietnam, so previous studies mainly focused on cross-listing such as studies by Karolyi (2006), Lel and Miller (2008), Abdallah and Ioannidis (2010), Abed and Abdallah (2019), the study of cross-listing increase managers' propensity to listen to the market in M&A deals by Abed and Abdallah (2017), or empirical study of the relationship between cross-listing and operating performance by Charitou and Louca (2009). In general, previous studies have not focused on explaining why firms choose to list on official stock exchanges, especially in Vietnam. Empirical studies in Vietnam only focus on firm performance of equitized SOEs after equitization, such as studies by Loc and Tran (2016), Tran *et al.*, (2015), Hung *et al.*, (2017), Nhan and Son (2017) or the IPO studies by Ly and Kha (2013), Tran *et al.* (2014). IPO and equitization studies have only focused on the first phase that firms go public, but they have not explained why firms have delayed listing in Vietnam.

These studies have not examined firm performance differences between listed and unlisted firms after equitization in Vietnam. There are no empirical studies that explain why firms need to list on the official stock market after equitization and why investors are not interested in investing in IPO. Although the Vietnamese government has had some strict regulations and policies to encourage firms to list after equitization, the number of firms listed on the official stock market is still limited and

the Vietnamese government should have a stricter mechanism to monitor the listing delay of equitized firms.

2.3.5 Underpricing when firms go public

According to Ritter and Welch (2002), an Initial Public Offering is the first issue of securities to the public with the expectation of helping businesses to sell their shares for the first time to the public. IPO is the best way for businesses to increase their working capital as well as this is an inevitable process in the trend of equitization/privatization (Ritter & Welch, 2002). In Vietnam, equitization methods include share issues and direct sales and share issues include IPOs, MBOs and other forms.

Short-run underpricing is the degree that can be calculated based on the security price difference between the first trading day and the IPO price (Ritter and Welch, 2002). Positive subtraction between the first trading day and IPO price can conclude underpricing and the negative result shows overpricing phenomenon. The signaling theory explains why firms underprice for IPOs, especially for IPO prices. The market feedback theory indicates that the true values of firms gradually can be reflected in the initial prices when firms are listed/trade because the market can reflect all information related to firms before IPOs and a period from IPOs to trading.

Jamaani and Alidarous (2019) have summarized theories explaining the short-run underpricing and explained that underpricing is the phenomenon where the trading prices of securities are higher than IPO prices, leading to initial returns for investors when securities are listed for trading. The long-run underpricing happens when the security prices in one specific month, day after trading are greater than IPO prices. There is also overpricing phenomenon when the security initial prices/ the security prices in one specific month, day after trading are less than IPOs prices. Investors are not interested in over-pricing because they can not get initial and long-run returns of IPOs.

According to Adjasi *et al.* (2011), Mehmood *et al.* (2021), the IPO underpricing is determined through the first-day return (Abnormal first-day return). This is denoted AR_i and is determined by the formula:

$$AR_i = R_i - R_{mi}$$

Where R_i is the raw first-day returns of stock *i* (through IPOs) and determined as follows:

$$R_i = \frac{P_{first} - P_{offer}}{P_{offer}}$$

Where P_{first} is the closing price of stock *i* on the first trading day;

P_{offer} is the average IPO offer price;

R_{mi} is the market return on the first trading day and can be determined through this formula:

$$R_{mi} = \frac{MI_{first} - MI_{offer}}{MI_{offer}}$$

Where MI_{first} is the market index on the first trading day;

MI_{offer} is the market index on the IPO offer day;

Many empirical studies believe that underpricing level also depends on different calculation methods. Aggarwal et al. (1993) propose to use the market-adjusted abnormal returns ($MAAR_i$) to determine the underpricing on the first trading as follows :

$$MAAR_i = 100 \times \left\{\left[\frac{1 + R_i}{1 + R_m}\right] - 1\right\}$$

In this dissertation, the author also applies AR_i and $MAAR_i$ to calculate underpricing level.

Empirical studies apply different timelines to measure the long-run underpricing through long-run returns of IPOs. Ritter (1991), Ahmad-Zaluki and Kect (2012) adopt 12, 24 and 36 months after the first trading day to measure the long-run performance of IPOs. The benchmark–adjusted return of stock *i* in the month *t* can be calculated as follows:

$$AR_{it} = r_{it} - r_{mt}$$

Where r_{it} is the raw stock return of firm *i* in the month *t* and r_{mt} is the monthly market return. According to Ritter (1991), the average benchmark-adjusted return on a portfolio of *n* stocks for month *t* can be as follows:

$$AR_t = \frac{1}{n}\sum_{i=1}^{n} AR_{it}$$

We can identify the cumulative benchmark-adjusted long-run performance from month q to month s as follows:

$$CAR_{q,s} = \sum_{t=q}^{s} AR_t$$

Up to now, IPO researchers have focused on short-run underpricing (or short-run returns) and long-run underpricing (or the long-run performance). Most researchers examine underpricing phenomena to evaluate the short-run performance (Chan *et al.*, 2004; Chang *et al.*, 2008). Perera and Kulendran (2016) apply the market-adjusted average abnormal return to prove that Australian IPOs have underpricing levels of 25.47% and 23.11%. Guo and Brooks (2008) also prove there is an underpricing of Chinese IPOs. Dimovski *et al.* (2010) have the same conclusions about underpricing in China. Underwriter reputation also affects underpricing in the short run in China (Chan, 2014). In France and Germany, there is also underpricing phenomenon in the short run although there are different IPO methods between the two countries (Goergen *et al.*, 2009).

Underpricing only shows the short-run performance of IPOs without considering the long-term performance of IPOs. Therefore, researchers often have to consider the additional long-term performance of IPOs. The long-term performance of IPOs attracts attention from worldwide researchers. Some researchers argue that IPOs show underperformance in the long run (Drobetz *et al.*, 2005; Gompers and Lerner, 2003). In contrast, other researchers prove that IPOs both show underperformance and overperformance in the long run (Bird and Yeung, 2010; da Silva Rosa *et al.*, 2003). Thus, each market has different characteristics, and it is impossible to determine when IPOs show underperformance or overperformance in the long run.

In Vietnam, Huang *et al.* (2016) study the first-day returns of IPOs. Meanwhile, Tran *et al.* (2014) study the evidence of IPO underpricing. Tran *et al.* (2014) also study the long-run performance of IPO in Vietnam but measure long-term

performance in specific periods rather than using cumulative long-term performance. This is the reason why the results of the study may not reflect the nature of long-term performance. Tran *et al.* (2014) have not studied short-run and long-run underpricing of IPOs for separate equitized SOEs in Vietnam. Besides, there is a long listing delay in Vietnam compared with other countries, so the underpricing level should be affected by listing delay and this is one special characteristic of IPOs in Vietnam.

Currently, several theories can explain why firms choose to underprice in the short run, and thereby generate returns for investors in IPOs, typically the market feedback theory proposed by Benveniste and Spindt (1989) and the signaling theory was suggested by Welch (1989). However, there is underperformance (or overpricing in the long run) because the efficient market theory explains that the market security prices reflect all historical and available information. In general, the studies mentioned above study both the short-term and long-term underpricing levels for all private and state-owned enterprises, so they do not clarify the level of underpricing of state-owned enterprises.

2.4 Research gaps

After summarizing empirical studies on the impact of privatization/equitization on firm performance, the author finds that there are five gaps as follows:

First, most of the previous empirical studies have not considered non-participating firms when evaluating how privatization/equitization impacts firm performance. Some studies have considered non-participating firms using propensity score matching (Claessens and Djankov, 2002; Loc and Tran (2016); Nhan and Son (2017). However, comparing propensity scores must be reasonable for the PSM technique; these authors only select the comparison of enterprises with the same size and year of establishment. This approach is inaccurate because we can not compare two enterprises if they operate in different industries or industry groups. Every industry has different competitive advantages, and these have a significant impact on firm performance. This is the severe drawback of using the PSM in previous empirical studies.

Although previous studies have used various methods to examine the effect of privatization on privatized enterprises' firm performance after privatization, these studies have revealed several limitations. Specifically, some authors like Harper (2002), Boubakri *et al.* (2004), D'Souza *et al.* (2005) only use the pre-post comparison method to identify changes in mean and median values of firm performance measures after privatization compared to the pre-privatization period. These studies have not explained why privatized enterprises operate more efficiently after privatization.

Tran *et al.* (2015) consider the effects of the privatization policy, but the authors do not use the PSM technique before developing the regression model, and this does not allow the author to choose equitized SOEs group (treatment group) and non-equitized SOEs (control group) with common characteristics. Nhan and Son (2017), Hung *et al.* (2017), Loc and Tran (2016) focus on SOEs equitized in the first and the second phase, so these studies have not considered large-scale SOEs in the third equitization phase in Vietnam. Thus, the first research gap is as follows:

Most of the previous studies have applied a pre-post comparison method to evaluate the impact of privatization/equitization on firm performance. Few studies have applied a with-without comparison method for privatization/equitization impacts. Tran *et al.* (2015), Loc and Tran (2016) have not considered equitization years and industry when choosing two participating and non-participating firms leading to a biased comparison.

Second, according to the public choice and the new public management theories, state intervention should not exist within firms to create free choices of firm managers for effective decisions. The efficient market theory explains that government interference does not create efficient capital markets. However, the Vietnamese government remains high state ownership within equitized SOEs after equitization to control these firms. Different from Developed countries and Russia, the Chinese government and Vietnamese government still interfere with firm operations of privatized and equitized SOEs. Thus, there should be empirical studies to evaluate how deregulation through privatization and equitization can create firm performance improvements. Empirical studies in China also show that state ownership reduction can not help privatized firms

improve firm performance because the State remains high ownership in privatized firms (Wei *et al.*, 2003; Chen *et al.*, 2006; Huang and Song, 2005; Liao *et al.*, 2014; Jiang *et al.*, 2009).

Some empirical studies also proved that state ownership reduction through equitization helps firm performance improvements in Vietnam (Loc *et al.*, 2006; Loc and Tran, 2016). However, there are still no empirical studies proving that the State should control equitized SOEs (remaining over 50% ownership within equitized SOEs) or transfer rights to the private sector in Vietnam (less than 50% ownership within equitized SOEs). Loc *et al.* (2006) have adopted a pre-post comparison method to examine changes in firm performance measures of equitized SOEs with state ownership smaller than 30% and greater than 30% only. In Vietnam, the State controls the decision-making process when holding at least 50% of shares in equitized SOEs. Thus, there is an unanswered question of whether the State should hold over 50% shares in equitized SOEs after equitization in Vietnam.

Third, the theory of competitive advantage also supports that industry should affect firm performance in general not only in privatization or equitization. According to Bachiller (2017), privatization impact dissimilarly on firm performance after privatization in both developed and developing countries. However, most previous studies have applied the pre-post comparison and regression method to consider the impact of privatization on firm performance according to different industries. Few empirical studies in Vietnam have not considered the impact of equitization on firm performance according to industry groups when considering non-equitized SOEs. Research results from this dissertation can propose equitization selection criteria for the Government according to industry groups.

Fourth, many countries have applied incentive policies, including tax reform and tax incentives to regulate the economy. However, the Vietnamese government only applied tax incentives for equitized SOEs and led to an unfair competitive environment for other enterprises in Vietnam. In Russia, there are some incentive policies for privatized SOEs, including budgetary subsidies, trade protection, and financial credits. The Chinese Government has had tax incentive policies for

businesses to attract foreign investment in technology, environment-friendly sectors, and tax incentives for businesses in certain localities. There is no direct tax incentive for privatized firms, like in Vietnam (Cao, 2000). Applying incentive policies for equitized SOEs from 2003 to March 2007 is a typical equitization characteristic in Vietnam. Most of the previous studies have not examined whether tax incentives impact on firm performance of equitized SOEs in Vietnam. Governments can apply incentive policies to regulate the economy. Most of the privatization supporting theories (invisible hand theory, mixed-economy theory and efficient market theory) explain that the States/ Governments should not interfere in firm operations. Thus, evaluating how tax incentive policy impact on firm performance of equitized SOEs in Vietnam is necessary in reality.

Most of the empirical studies have not examined firm performance differences between listed and unlisted firms after equitization in Vietnam. There are no empirical studies that explain why firms need to list on the official stock market after equitization and why investors are not interested in investing in IPO.

Finally, most of the empirical studies have identified that firms tend to underprice to attract IPO investment and ensure successful IPO issues or privatization. The signaling theory ad market feedback theory support this assumption and the market efficient theory explains that the market can reflect all historical or present information related to enterprises or securities. Equitized firms through IPOs also tend to underprice in Vietnam (Tran *et al.*, 2014). Tran et al. (2014) find that there is underpricing phenomenon of Vietnamese ÍPOs in the short term (AR_i reached 38% and $MAAR_i$ reached 49%). However, this study focuses on both private and state-owned enterprises, so the research results do not explain the underpricing phenomenon of state-owned enterprises separately when equitization. Also, Tran *et al.* (2014) have not fully considered IPO underpricing of equitized SOEs in the long run in Vietnam.

Most of the previous studies have not examined whether there is underpricing of equitized SOEs in Vietnam through IPOs. Equitized SOEs do not list immediately after equitization and many equitized ones do not list after equitization. Thus,

underpricing of equitized SOEs may be different compared with firms in other countries with no listing delays.

2.5 Summary of chapter 2

Based on empirical studies from developed and developing countries, this chapter has represented some theoretical and practical research gaps. Thus, five research gaps need to be fulfilled, including the impact of equitization on firm performance compared with non-equitized SOEs, especially according to average state ownership after equitization and industry groups. Also, there are gaps in analyzing how equitization impacts equitized ones with tax and without tax incentives in Vietnam. Most of the empirical studies have not considered firm performance differences between listed and unlisted firms after equitization in Vietnam. Furthermore, underpricing phenomenon of equitized SOEs through IPOss should be considered. The dissertation will handle the above gaps through five hypotheses and five models presented in chapter 3.

Chapter 3. METHODOLOGY, DATA AND RESEARCH MODELS

Chapter 3 represents hypothesis development to answer five research questions based on five research objectives and research gaps. This chapter also includes the introduction of research models, data collection and estimation methods.

3.1 Hypothesis development

3.1.1 The impact of equitization on firm performance of equitized state-owned enterprises compared with non-equitized state-owned enterprises

3.1.1.1 The impact of equitization on profitability of equitized state-owned enterprises compared with non-equitized state-owned enterprises

After equitization, firms tend to reduce state ownership and increase private ownership. Equitization and privatization are quite similar in state ownership reduction but equitization exhibits gradual divestment compared with privatization. Thus, privatization theories can explain the impact of equitization on firm performance compared with non-equitized firms in the same period. According to the new public management theory, privatization helps privatized SOEs restructure ownership and change control mechanisms to improve firm performance. Non-equitized SOEs do not reduce state ownership and state intervention, so these firms can not perform better than equitized firms in terms of firm performance.

O'Toole *et al.* (2016) test the difference in investment efficiency between state-owned enterprises (SOEs) and private firms, and research results show that there is no evidence of investment spending being linked to marginal returns of SOEs across all sectors and size classes. Privatized SOEs could improve profit after privatization in China. However, there is no difference in profit improvement between SOEs and non-SOEs (Liao *et al.*, 2014; Mckenzie and Keneley, 2011).

Jiang *et al.* (2009) compare the firm performance of SIP SOEs and non-SIP SOEs in China and find that privatization does not help SIP SOEs operate more effectively, especially when compared with non-SIP SOEs in the same periods. Arcas and Bachiller (2010) prove that privatized firms are not less efficient than firms with

private ownership in the European Union. Especially, privatized firms are more profitable than private firms in terms of ROA, ROE and ROS.

Claessens and Djankov (2002) study the benefits of privatization policy and compare firm performance between 6,354 privatized and state-owned enterprises in Eastern Europe during 1992-1995. After privatization, privatized enterprises have an increase in sales, labor productivity, and fewer job losses. Vietnamese equitized SOEs have higher profitability (pre-tax profit to total assets and pre-tax profit to sales) than non-equitized ones in the equitization years of 2007, 2009, and 2010 (Loc and Tran, 2016). Research results show that equitized SOEs improve 21.5% higher pre-tax profit to total assets than non-equitized SOEs in the equitization years of 2007, 2009, and 2010 in Vietnam. Also, income before tax to sales of equitized SOEs is higher than that of non-equitized SOEs in Vietnam (6.8% for equitized enterprises in 2007 and 3.6% for equitized enterprises in 2009). According to Loc and Tran (2016), equitization has a positive impact on the profitability improvement of equitized SOEs compared with non-equitized SOEs in Vietnam. Also, Tran *et al.* (2015) conclude that privatized firms perform better after privatization compared with private firms, especially profitability (ROA and ROE) in the case of equitized SOEs in 2006 in Vietnam. This dissertation has some differences compared with the study conducted by Loc and Tran (2016) when profit after tax is applied instead of profit before tax. Besides, this dissertation uses the net income efficiency ratio. The basic theorem of welfare economics theory explains that state intervention is necessary to allocate suitable resources for the public sector and private sector when there is no Pareto efficiency. Thus, privatization/ equitization is necessary to transfer state assets to the private sector to allocate resources.

Most previous studies have compared firm performance between privatized and private enterprises, but very few studies compare between privatized and non-privatized SOEs in the same period. Also, most studies suggest that privatized firms do not improve their performance compared with their peers. However, studies in Vietnam by Loc and Tran (2016), Tran *et al.* (2015) suggest that equitized firms improve their post-equitization profitability compared with non-participating SOEs.

3.1.1.1 The impact of equitization on operating efficiency of equitized state-owned enterprises compared with non-equitized state-owned enterprises

Liao *et al.* (2014) find that privatization does not improve the operating efficiency of privatized SOEs (accounts receivable turnover, expense-to-sales ratio, asset turnover) than non-SOEs (private firms). According to Arocena and Oliveros (2012), there is no significant difference in efficiency between privatized SOEs and private firms in the same periods before privatization. However, there is a significant improvement in privatized SOEs' efficiency after privatization while there is no improvement in this aspect of private firms in Spain. The research results are inconsistent with previous studies explaining that private firms tend to perform better than privatized SOEs. Another research on the impact of privatization on performance in the Australian banking and insurance sector has shown that privatized institutions have similar operating efficiency (expense to asset and cost to income) compared to private peer institutions both before and after privatization (Mckenzie and Keneley, 2011). Privatization is not a key to firm performance improvement after privatization in the Australian banking and insurance sector.

For measuring operating efficiency, Loc and Tran (2016) use two proxies of total asset turnover and labor productivity. Total asset turnover of equitized SOEs is significantly improved compared with non-equitized SOEs in the equitization years of 2007, 2008 and 2009. There is no evidence to conclude that equitization helps equitized SOEs improve labor productivity compared with non-equitized SOEs in Vietnam (Loc and Tran, 2016). Loc and Tran (2016) also analyze the impact of equitization on firm performance of equitized SOEs compared with non-equitized SOEs by firm size, ownership structure after equitization (high and low rates) and there are different impacts of equitization on firm performance of equitized SOEs compared with non-equitized SOEs according to these characteristics.

Theories and most empirical findings have indicated that equitized SOEs can improve profitability and operating efficiency, so the hypothesis is as follows:

H1: Equitization helps equitized SOEs improve firm performance compared with non-equitized SOEs.

3.1.2 The impact of equitization on firm performance of equitized state-owned enterprises compared with non-equitized state-owned enterprises by average state ownership rates after equitization

The equitization nature in Vietnam is quite similar to the privatization nature in China. The Vietnamese Government has gradually applied partial equitization like privatization in China. Enterprises still retain state ownership after equitization and are dominantly controlled by the State. Some empirical studies examine how equitization impacts on firm performance of equitized SOEs by average state ownership.

Loc and Tran (2016) classify the sample into two groups of a high rate of state ownership and a low rate of state ownership. The first group includes equitized SOEs having the two-year post-equitization average rate of state ownership which is equal to or higher than its median and the second group includes equitized SOEs having the two-year post-equitization average rate of state ownership which is lower than its median. Equitized SOEs with a high rate of state ownership do not significantly improve firm performance compared with non-equitized firms in the same period. However, equitized SOEs with a low rate of state ownership show statistical improvements in profitability (income before tax to total assets for firms equitized in 2007, 2008; income before tax to total sales for firms equitized in 2009). However, non-equitized SOEs have statistically higher operating efficiency (total asset turnover) compared with equitized firms with a high rate of state ownership (for equitized firms in 2008) (Loc and Tran, 2016). In general, enterprises still retain state ownership after equitization and state control (slow divestment of state capital) in Vietnam. Enterprises in Vietnam have plodding divestment progress of state capital, which may lead to poor performance in the short run after equitization due to little change in management and control mechanisms. Thus, evaluating the impact of equitization on firm performance of equitized SOEs compared with non-equitized SOEs by average state ownership rates after equitization is necessary.

In China, the impact of privatization on firm performance is different according to the average state ownership rate after privatization (Liao, 2014). Especially, privatized firms have different improvements in profitability (ROA, ROE) and operating

efficiency (Accounts receivable turnover, asset turnover, inventory turnover) according to four groups of state ownership rates (zero, low, medium and high rates). Research results also show SOEs experience significantly stronger post-reform improvement in performance than non-SOEs, Thus, the next hypothesis is as follows:

H2: When considering non-equitized SOEs in the same period, equitization impacts firm performance dissimilarly according to average state ownership rates after equitization.

Hypothesis H2 is stated to examine the equitization characteristic of gradualism in Vietnam. The author evaluates how equitization impacts firm performance according to average state ownership rates after equitization to know whether there should be quick divestment with no state control in equitized firms after equitization.

3.1.3 The impact of equitization on firm performance of equitized state-owned enterprises compared with non-equitized state-owned enterprises according to industry groups

According to the competitive advantage theory, the competitive nature and competitive advantage resources vary widely among industries or even in small segments within the same industry. Some researchers have found that the impact of privatization on firm performance is different among industries (Sheshinski and López-Calva, 2003; Bachiller, 2012). According to Rakhman (2018), there are different firm performance improvements according to industry groups in Indonesia. Bachiller (2017) summarizes 392 empirical studies using industry when evaluating how privatization impacts firm performance in different countries and there are differences in firm performance improvements after privatization in both developed and developing countries. Chinese firms in the manufacturing industry improve firm performance compared with the total sample (Jiang *et al*., 2009). Alipour (2013) also uses industry groups in research models when evaluating the impact of privatization on firm performance in Iran. According to Arcas (2010), there are 11 industry groups in Iran and firms in regulated industries are less profitable than non-regulated firms.

There are also some empirical studies indicating that the impact of equitization on firm performance is different according to industries (Pham, 2019; Tran, 2015).

According to Loc (2006), there are differences in firm performance improvements of equitized SOEs after equitization in Vietnam. Firms operating in different industries have distinctive characteristics compared with others and these distinctions can affect firm performance improvements after equitization. The Government has issued the Decision 22/2021/QD-TTg to choose firms in specific industries for maintaining state ownership after equitization. Thus, it is necessary to figure out which industry group that the government should choose to equitize in equitization plans. Based on the theory of competitive advantage and empirical studies, the author proposes the next hypothesis as:

H3: When considering non-equitized SOEs in the same period, equitization impacts firm performance dissimilarly according to industry groups

3.1.4 The impact of tax incentives on firm performance and firm performance differences between listed and unlisted firms after equitization

3.1.4.1 The impact of tax incentives on firm performance

Tax incentives have both advantages and disadvantages at the firm level and national level. Tax incentives have some advantages to ensure firm development and firm performance improvement. Tax incentives or tax cuts can be applied for corporate income tax to stimulate enterprises to improve firm performance and increase output. Change in tax rates can directly impact output and lower tax rates can increase the output of firms. The Vietnamese government applied corporate income tax incentives to help equitized SOEs perform better after equitization. According to Klemm (2010), benefits from tax incentives are difficult to assess but firms can take these benefits for investment activities and improve firm performance or even firm growth. However, tax incentives can lead to state budget losses and have a negative effect on economic development. Appling tax incentives policies can create an unfair competition environment if these policies are not applied to all firms in the whole economy. Tax incentives require complicated administration regulations and costs when applied to only some organizations. Also, when firms have tax incentives, it does not mean that these firms can improve firm performance but the

firm performance improvement is affected by other factors, such as strategies, resources, technologies, etc. The Chinese and Russian governments have only applied tax incentives for firms when investing in scientific and technological development research projects, education and training to improve labor productivity.

Aussenegg and Jelic (2007), Farinos *et al.* (2007) prove that privatized firms experience no improvement in profitability and operating efficiency. Privatized SOEs improve firm performance differently based on different firm characteristics and privatization policies. According to Radygin (2014), incentive policies help countries speed up privatization progress but this creates an unfair competition environment among enterprises. Different countries apply different incentive policies for privatization programs. Privatized SOEs take advantage of some incentive policies, including budgetary subsidies, trade protection, and financial credits in Russia and these policies can help privatized SOEs improve firm performance (Boycko *et al.* (1994). In China, the Government has tax incentive policies for businesses to attract foreign investment in technology, environment-friendly sectors, and tax incentives for businesses in certain localities. These policies help privatized SOEs have some advantages compared with non-privatized SOEs in China (Cao, 2000). In Vietnam, the Government applied tax incentives for corporate income tax to equitized SOEs in a certain period which can lead to profitability improvement.

According to the Organization for Economic Co-operation and Development, tax incentive policy is the provision of tax incentives to offer preferential tax treatment for enterprises over time. Also, tax incentives can be special exclusions, exemptions, or deductions providing special credits, preferential tax rates for enterprises to ensure output increase (Bird and Zolt, 2003). Tax incentives or tax cuts directly affect profitability and then boost efficiency. The welfare economics theory also explains that Governments can apply tax incentives or tax cuts to regulate the economy.

Several countries use several incentive methods to speed up the privatization process, leading to stagnation in financial market development because enterprises rely too much on incentive policies and change slowly after privatization (Radygin (2014). Privatization incentive policies positively affect the firm performance of

privatized SOEs, but this is likely to lead to unfair competition for enterprises (compared with non-privatized SOEs) (Aslund, 2013).

The Vietnamese Government issued Decree 164/2003 / ND-CP on December 22rd, 2003, detailing the Law on Enterprise Income Tax (CIT). According to this Decree, SOEs participating in the equitization program from 2003 to March 2007 can apply tax incentives. Tax incentive policy for equitized SOEs is also one characteristic of equitization in Vietnam. This policy directly affects profit after tax and reinvestment activities of equitized SOEs. This policy was applied in a certain period from 2003 to March 2007, so it is necessary to evaluate how tax incentives impact firm performance changes after equitization in Vietnam. According to the mixed-economy theory, governments can apply tax policies to regulate economies and create opportunities for firm performance improvements.

In general, tax incentives bring benefits for equitized SOEs because these firms can take advantage of tax incentives for high profit after tax. However, tax incentives can cause state budget losses and create an unfair competitive environment within one economy.

3.1.4.2 Firm performance differences between listed and unlisted firms after equitization

Theories that explain why firms go public should include life cycle and market-timing theories. The life cycle theory explains that firms go public through privatization and listing to take advantage of diversifying ownership structure. Market-timing theory also claims that the decision to go public is only done at an appropriate time. According to this theory, firms choose going public and listing when there are good market conditions and good firm performance to attract investors for capital.

Previous studies in China or developed countries have focused on cross-listing issues, or the reason firms being listed in another country instead of in the host country. Karolyi (2006) studies why firms seek opportunities to list abroad in developed countries to benefit from capital mobilization costs because of easy access to global investors. Lel and Miller (2008) also examine the cross-listing issue of firms

in the United States, which shows that foreign businesses tend to list in the U.S to take advantage of U.S stock market development. Abed and Abdallah (2019), Abdallah and Ioannidis (2010) have also made the same assumptions that firms selected the US for cross-listing because of the developed financial market and firms can be easy to get access to global investors and reduce capital mobilization costs.

Charitou and Louca (2009) study the performance of non-US firms that are listed on US stock exchanges using American depository receipt (ADR) programs. The research results show that capital-raising of cross-listed firms experience improvements in their operating performance after the listing, relative to a non-cross-listed matched sample of firms and relative to the pre-listing period.

Some empirical studies in Vietnam about equitization also have a similar conclusion that going public through equitization helps firms improve performance. Although equitization is not similar to listing status, these events also show that firms go public and firm performance can be improved after equitization or IPOs. Loc and Tran (2016) have argued that going public through equitization can help Vietnamese SOEs improve their performance using the pre-post comparison method. Tran *et al.*, (2015) have used the regression method to assess the impact of equitization on firm performance in Vietnam and their research results are consistent with the study by Loc and Tran (2016). These results are consistent with the empirical results in the developed countries such as the study by Megginson *et al.*, (1994).

As reported by the Vietnam Ministry of Finance (2020), 755 equitized SOEs were not listed/registered for trading on the stock market up to August 31, 2019. The reason for the listing delay is that several enterprises operate inefficiently after equitization. There are businesses in the process of dealing with consequences of violations detected in the inspection and examination of Government agencies, failing to organize the General Meeting of Shareholders to ask for opinions on a plan to list their stocks after equitization. Some enterprises have problems determining the value of state capital when they officially transform to joint-stock companies and have not yet made equitization finalization according to audit regulations. Wan and Yuce (2007) conclude that enterprises are usually listed after privatization in China. Post-

privatization enterprises are also listed on stock markets in developed countries, and these countries rarely show listing delay as in Vietnam.

Overall, the above studies show that firms have improved their profitability and operating efficiency after going public, including cross-listing, equitization or privatization. A listing issue is also an official event marking the official time to go public of firms in Vietnam. Although tax incentives have both advantages and disadvantages, tax incentives could have a direct impact on firm performance changes when firms use benefits from tax incentives for investment and innovation activities. Thus, the authors propose the following general research hypothesis:

H4: Tax incentive policy has a direct impact on firm performance changes of equitized SOEs in Vietnam and there are differences in firm performance changes between listed and unlisted firms after equitization.

3.1.5 Underpricing of equitized state-owned enterprises through the initial public offering

Currently, several theories can explain why privatized firms choose to underprice when going public and thereby generate initial returns for investors in IPO deals, typically the market feedback theory and the signaling theory. The market feedback theory states that underwriters tend to underprice IPOs to attract investors participating in IPO deals. After setting a low price, underwriters wait for investors' feedback to determine the average IPO price. This theory explains underpricing in the short run. Also, the signaling theory explains that privatized SOEs that would like to be successful in IPOs tend to underprice their IPOs. Investors know the signal from privatized SOEs and are willing to invest in IPOs for getting the initial returns. However, there is an overpricing phenomenon in the long run as explained by the divergence of opinion theory. According to this theory, IPO prices tend to be declined in the long run because investors know information about corporate performance and market information becomes fully transparent after listing, the divergence of opinions of subjective and pessimistic investors will be narrowed, leading to a long-term decline in IPO price.

Perera and Kulendran (2016) study the underpricing phenomenon of IPOs in Australia. The authors use ordinary least squares and binary regression methods to forecast the underpricing and initial returns of IPOs. According to Guo and Brooks (2008), there is IPO underpricing of A-class stocks in China. Appendix 7 shows underpricing in the short run in China over time. The underpricing in China can be explained through the underwriter, issuer reputation, and the issue characteristics of IPOs (Dimovski *et al.*, 2010). Meanwhile, Chan (2014) explains that the reputation of the IPO stock distribution agent can affect underpricing in China. There is also a similar underpricing phenomenon in Germany because privatized firms would like to attract more investors in IPO investment. There is also a difference in IPO pricing methods between France and Germany (Goergen *et al.*, 2009). Huang *et al.* (2016), Tran *et al.* (2014) find evidence of short-term underpricing of IPOs in Vietnam. Some factors can affect underpricing in Vietnam, including firm characteristics, share issue characteristics and investor expectation.

The divergence of opinion theory explains fluctuations of IPO long-run underpricing. Therefore, IPOs are likely to overperform or underperform in the long term. According to Omran (2005), when investors are too subjective about the IPO initial returns, there is a reduction in long-run returns of IPOs over time, leading to overpricing in the long run. Therefore, empirical studies also show that there is an inverse relationship between initial returns and the long-run performance of IPOs. Ritter (1991) also proves that there is a similar phenomenon in the U.S market. Also, Amor and Kooli (2016), Jog *et al.* (2019) conclude that there is an overpricing phenomenon of IPOs in the long run in China.

Recently, the completion of mechanisms and equitization policies in asset valuation, in particular, has been entirely issued through the application process with appropriate adjustments to the actual situation. In particular, the introduction of Decree 59/2011/ND-CP and its amendments, supplements, and guidelines are some of the essential factors which help the equitization progress from 2011- 2015 be faster, minimizing the possibility of the state capital and asset losses in the equitization process. Obstacles and difficulties in the process of implementing the

valuation of SOEs have been further removed in Decree 126/2017/ND-CP, creating a premise for the completion of the plan. However, the valuation of SOEs in practice has certain shortcomings in the financial issues of equitized SOEs.

Determining the enterprise value faces many difficulties, so there are many cases where the enterprise value through auditing differs significantly from the reported value of the enterprise. Table 3.1 shows differences in the asset valuation of enterprises according to reported and re-audited figures of some enterprises. The most significant difference in valuation is Binh Son refining and petrochemical Company Limited (with VND 5,359,897 million), followed by Petrovietnam power corporation with VND 1,994,458 million).

Table 3.1. Actual values of eight equitized state-owned enterprises after being audited for equitization pricing

Unit: mil VND

No.	Firm	Reported values	Audited values	Difference
1	Binh Son refining and petrochemical Company Limited	67,515,954	72,875,851	5,359,897
2	Petrovietnam power corporation	58,628,826	60,623,284	1,994,458
3	PetroVietnam Oil Corporation	18,796,390	19,308,923	512,533
4	Vietnam rubber group	49,293,521	49,868,623	575,102
5	Thanh Le Corporation	7,410,147	7,505,236	95,089
6	Saigon tourist cable television Company Limited	6,035,785	6,145,882	110,097
7	Vietnam Cable Television Company Limited	3,955,754	4,249,233	293,479
8	Vinafood II	14,277,102	14,603,234	326,132

Source: The State audit office of Vietnam (2017)

Most Vietnamese enterprises choose IPO as a form of SIPs when equitizing. According to research by Tran et al. (2014), enterprises have an underpricing phenomenon after IPO in Vietnam, and the underpricing degree measured by the two alternative methods is 38% and 49%, respectively. Thus, the final hypothesis is as follows:

H5: Vietnamese equitized SOEs tend to underprice IPOs when equitization and the underpricing occurs in the short run but overpricing occurs in the long run.

Based on the five hypotheses groups, the author summarizes the hypotheses of the dissertation as follows:

Table 3.2 Summary of research hypotheses

Research gaps	Hypotheses	Theories
(1)	H1: Equitization helps equitized SOEs improve firm performance compared with non-equitized SOEs.	The new public management theory The efficient market theory
(2)	H2: When considering non-equitized SOEs in the same period, equitization impacts firm performance dissimilarly according to average state ownership rates after equitization	The new public management theory The efficient market theory The mixed economy theory
(3)	H3: When considering non-equitized SOEs in the same period, equitization impacts firm performance dissimilarly according to industry groups	The competitive advantage
(4)	H4: Tax incentive policy has a direct impact on firm performance changes of equitized SOEs in Vietnam and there are differences in firm performance changes between listed and unlisted firms after equitization	The welfare economics theory The life cycle and market-timing theories
(5)	H5: Vietnamese equitized SOEs tend to underprice IPOs when equitization and the underpricing occurs in the short run but overpricing occurs in the long run.	The market feedback theory The signaling theory

Source: Author's analysis

3.2 Research models

For the final research gap about testing underpricing in the short run and long run, the author only applies t-Test for the mean different from 0. Thus, there is no research model needed for the final research gap.

3.2.1 Research model to examine the impact of equitization on firm performance changes of equitized state-owned enterprises compared with non-equitized state-owned enterprises

Based on hypotheses H1, H2 and H3, with – without comparison method is employed through propensity score matching techniques. This study proposes to use a

with-without comparison approach using propensity score matching with comparative control variables based on research work by Tran *et al.* (2015) to identify common support areas, including firm size (the natural logarithm of total real assets), the natural logarithm of the number of operating years, industry, and equitization year. Megginson *et al.* (1994) also suggest an increase in privatized enterprises' real sales and firms in different industries will have different gains after privatization. Therefore, each industry's characteristics and competitiveness will determine the firm performance of enterprises after privatization. The author also applies industry as one control variable in the regression model (1).

$$Yi = \beta_0 + \beta_1 \mathrm{LNAGE}_i + \beta_2 \mathrm{LNASSET}_i + \beta_3 \mathrm{IND}_i + \beta_4 \mathrm{EQUIyear}_i + \varepsilon_i \quad (1)$$

LNAGE_i is the natural logarithm of SOEs' operating year, $\mathrm{LNASSET}_i$ is the natural logarithm of total assets in equitization years, IND_i is the industry dummy variable, and $\mathrm{EQUIyear}_i$ is the equitization year dummy.

The author estimates the impact of the equitization program using a difference-in-difference matching estimator through the estimation model (2).

With data on participant and control observations before and after program intervention, a difference-in-difference (DID) matching estimator can be constructed. With data over two privatization periods $t = (0,1)$, the local linear DID estimator for the mean difference in outcomes Y_{it} across participants i and nonparticipants j in the common support is given by

$$\mathrm{TOT}_{\mathrm{PSM}}^{\mathrm{DID}} = \frac{1}{\mathrm{N_T}}\left[\sum_{\mathrm{i}\in\mathrm{T}}(\mathrm{Y}_{\mathrm{i1}}^{\mathrm{T}} - \mathrm{Y}_{\mathrm{i0}}^{\mathrm{T}}) - \sum_{\mathrm{j}\in\mathrm{C}}\omega(\mathrm{i},\mathrm{j})(\mathrm{Y}_{\mathrm{j1}}^{\mathrm{C}} - \mathrm{Y}_{\mathrm{j0}}^{\mathrm{C}})\right] \quad (2)$$

Where N_T is the number of participants i and $\omega(i, j)$ is the weight used to aggregate outcomes for the matched nonparticipants j

There are certain equitized SOEs groups according to hypotheses H2 and H3, the author applies the estimation model (3) and (4) for different groups of average state ownership and industry groups.

$$\mathrm{TOT}_{\mathrm{PSM}}^{\mathrm{DID}} = \frac{1}{\mathrm{N_T}}\left[\sum_{\mathrm{i}\in\mathrm{T}}(\mathrm{ROA}_{\mathrm{i1}}^{\mathrm{T}} - \mathrm{ROA}_{\mathrm{i0}}^{\mathrm{T}}) - \sum_{\mathrm{j}\in\mathrm{C}}\omega(\mathrm{i},\mathrm{j})(\mathrm{ROA}_{\mathrm{j1}}^{\mathrm{C}} - \mathrm{ROA}_{\mathrm{j0}}^{\mathrm{C}})\right] \quad (3)$$

Where N_T is the number of equitized SOEs i and $\omega(i, j)$ is the weight used to aggregate outcomes for the matched non-equitized SOEs j

$$\mathrm{dROA}_{\mathrm{i}}^{\mathrm{T}} = \mathrm{ROA}_{\mathrm{i1}}^{\mathrm{T}} - \mathrm{ROA}_{\mathrm{i0}}^{\mathrm{T}}$$

$$\mathrm{dROA}_{\mathrm{j}}^{\mathrm{C}} = \mathrm{ROA}_{\mathrm{j1}}^{\mathrm{C}} - \mathrm{ROA}_{\mathrm{j0}}^{\mathrm{C}}$$

$$\mathrm{TOT}_{\mathrm{PSM}}^{\mathrm{DID}} = \frac{1}{\mathrm{N_T}}\left[\sum_{\mathrm{i}\in\mathrm{T}}(TAS_{\mathrm{i1}}^{\mathrm{T}} - \mathrm{TAS}_{\mathrm{i0}}^{\mathrm{T}}) - \sum_{\mathrm{j}\in\mathrm{C}}\omega(\mathrm{i},\mathrm{j})(\mathrm{TAS}_{\mathrm{j1}}^{\mathrm{C}} - \mathrm{TAS}_{\mathrm{j0}}^{\mathrm{C}})\right] \quad (4)$$

Where N_T is the number of equitized SOEs i and $\omega(i, j)$ is the weight used to aggregate outcomes for the matched non-equitized SOEs j

$$\mathrm{dTAS}_{\mathrm{i}}^{\mathrm{T}} = \mathrm{TAS}_{\mathrm{i1}}^{\mathrm{T}} - \mathrm{TAS}_{\mathrm{i0}}^{\mathrm{T}}$$

$$\mathrm{dTAS}_{\mathrm{j}}^{\mathrm{C}} = \mathrm{TAS}_{\mathrm{j1}}^{\mathrm{C}} - \mathrm{TAS}_{\mathrm{j0}}^{\mathrm{C}}$$

3.2.2 Research model to evaluate how tax incentives and listing affect firm performance changes

Hypothesis H4 indicates that tax incentive policy has a direct impact on firm performance changes (dROA and dTAS) of equitized SOEs and firm performance differences of listed firms and unlisted firms in Vietnam. Most of the empirical studies in developed countries have not considered listing status as one control variable that affects the firm performance of privatized firms because these firms tend to list immediately after privatization. However, firms tend to have a long listing delay after equitization in Vietnam (Tran *et al.*, 2015). Loc *et al.* (2006) find that listing status has an inverse impact on profitability (net income before tax to assets, net income before tax to sales and net income before tax to equity) but has no impact on operating efficiency of equitized SOEs in Vietnam. Listed and unlisted firms have different improvements in performance in Vietnam.

There are also some factors affecting firm performance changes of equitized SOEs, including state-ownership change after equitization, change in employment, change in leverage, firm age, change in sales growth, industry and equitization phases in Vietnam.

State ownership change after equitization

The new public management theory explains that privatization can help privatized SOEs improve firm performance (profitability and operating efficiency) after privatization. However, this theory only figures out privatized SOEs can improve firm performance without state interference after privatization.

According to Iwasaki and Mizobata (2018), privatization lowers state ownership in the firm and increases firm performance. Privatization changes firm ownership, and it is hard to assess the impact of privatization on firm performance without considering firm ownership changes after privatization. A higher proportion of state ownership can lead to lower firm profitability of privatized SOEs in Vietnam (Pham and Nguyen, 2019). Also, ownership concentration has a negative relation to firm performance (Wang and Shailer, 2015). In China, Liao *et al.* (2014) also use state ownership change as one variable to assess how privatization helps SOEs improve firm performance. State ownership change has a positive impact on firm performance (operating revenue and operating profit).

Change in employment

According to Zakaria *et al.* (2014), firm size has a significant impact on the profitability (ROA) of privatized SOEs. Firm size can be determined by the total number of employees, total assets and sales. Rakhman (2018) also proves that firm size can be considered as one control variable and has a significant impact on ROA and total asset turnover. In Vietnam, change in employment has a positive impact on ROA and total asset turnover (Tran *et al.*, 2015).

Change in leverage

According to Rakhman (2018), leverage has an inverse impact on the profitability (ROA) and operating efficiency (total asset turnover) of privatized SOEs and private firms. Most of the empirical studies show that the more financial leverage privatized SOEs use, the less ROA and total asset turnover these firms gain. Zakaria *et al.*, (2014) find that there is an inverse relationship between leverage and ROA.

Firm age (the number of operating years until equitization)

The number of operating years of privatized SOEs from the establishment to privatization years can affect firm performance. Especially, the number of operating

years of firms has a positive impact on profitability (ROA) and a negative impact on operating efficiency (total asset turnover) of privatized SOEs and non privatized SOEs (Rakhman, 2018). Furthermore, Tran *et al.*, (2015) indicate that the number of operating years of firms has a significant impact on change in ROA (dROA).

Change in sales growth

Sales growth can have a significant impact on profitability and operating efficiency. Empirical studies have shown that change in sales growth has a positive impact on firm performance changes of privatized SOEs. Rakhman (2018) finds that change in sales growth has a direct impact on profitability (ROA and ROE) and operating efficiency (total asset turnover).

Listing, industry and equitization phases in Vietnam

Based on hypothesis 4, the author use listing variable (LIST) in the research model (5). The impact of privatization on firm performance of privatized SOEs are different according to different industry groups and equitization years or periods. In Vietnam, equitization years or periods have a significant impact on firm performance (Loc *et al.*, 2006). Rakhman (2018) uses industry and privatization years as control variables since they may affect the firm performance of privatized SOEs. Liao et al. (2014) indicate that privatized firms tend to improve operating efficiency and profit differently according to industry groups and privatization years in China.

Based on hypotheses from H4, the regression equation can be written as follows:

$$\mathrm{dPerf}_i = \beta_0 + \beta_1 \mathrm{dSTATE}_i + \beta_2 \mathrm{TAXAD}_i + \beta_3 \mathrm{dLNEMP}_i + \beta_4 \mathrm{dLEV}_i + \beta_5 \mathrm{LNAGE}_i + \beta_6 \mathrm{dGROWTH}_i + \beta_7 \mathrm{LIST}_i + \beta_8 \mathrm{IND}_1 + \beta_9 \mathrm{IND}_2 + \beta_{10} \mathrm{PHASE}_i + \varepsilon_i \quad (5)$$

Dependent variables ($\mathrm{dPerf_i}$) include changes in operating efficiency ($\mathrm{dTAS_i}$) and profitability ($\mathrm{dROA_i}$).

Explanatory variables include $\mathrm{dSTATE_i}$, $\mathrm{TAXAD_i}$ and $\mathrm{LIST_i}$ (Table 3.4).

Control variables include the change in the natural logarithm of the average total employees during four-year equitization windows ($\mathrm{dLNEMPL_i}$), change in the average leverage during four-year equitization windows ($\mathrm{dLEV_i}$), The natural logarithm of the operating year of SOEs ($\mathrm{LNAGE_i}$), change in the average sales growth during four-year equitization windows ($\mathrm{dGROWTH_i}$), industry ($\mathrm{IND_1}$ and

IND_2), and equitization phases ($PHASE_i$). Different from the research models proposed by Rakhman (2018), this dissertation applies regression models for cross-section data.

Specific contents of estimation methods will be also discussed in the next section (3.5 Estimation methods).

3.3 Variable measurement

3.3.1 Variable description to examine the impact of equitization on firm performance changes of equitized state-owned enterprises compared with non-equitized state-owned enterprises

Since Megginson *et al.* (1994) propose using seven measures of firm performance when considering the impact of privatization on the firm performance of privatized enterprises, most of the subsequent empirical studies have also used these measures (Liao *et al.*, 2014); Claessens and Djankov, 2002); Loc *et al.*, 2006; Loc and Tran, 2016). These seven firm performance measures include: (1) profitability (ROE, ROA, and ROS); (2) operating efficiency (sales/number of employees, net income/number of employees); (3) capital investment (capital expenditures/sales, capital expenditures/total assets); (4) output (nominal sales/consumer price index); (5) employment (total number of employees); (6) leverage (total debt/total assets, long-term debt/equity); and, (7) payout (cash dividends/sales, cash dividends/net income).

In general, previous studies by Huang and Song (2005), Bachiller (2012), Pham (2017), Huang and Wang (2011) have different research results, but they have common points. Most of them apply seven firm performance measures to evaluate firm performance changes proposed by Megginson *et al.* (1994).

In this study, the author does not use payout measures because most equitized SOEs in Vietnam are not listed immediately after equitization. This dissertation does not use capital investment measures due to data limitations in Vietnam. The author uses ROA as a profitability variable only because of three reasons: (1) Most of the previous studies have applied ROA to measure firm profitability to measure how privatization/equitization affects firm performance. Appendix 2 shows that most of

the empirical studies have applied ROA instead of ROE or ROS to measure firm profitability. Second, Rakhman (2018) also uses ROA and asset turnover (total sales/total assets) as firm performance measures to identify the impact of privatization on firm performance. Third, ROA indicates how profitable equitized SOEs are concerning their total assets. Vietnamese SOEs can have an underpricing phenomenon when equitization and equitization can reduce state assets by transferring to the private sector. Thus, it is more suitable to choose ROA than ROE to measure firm profitability to evaluate how equitization can impact the profitability of equitized SOEs in Vietnam. Also, due to data limitations and adoption from the empirical study by Rakhman (2018), this dissertation applies the two firm performance measures as follows:

(1) Change in profitability (dROA) is measured through change in return on assets (dROA) through four-year equitization windows. Return on assets is a ratio of profit after tax and total assets.

(2) Change in operating efficiency (dTAS) is measured through the change in total asset turnover (dTAS) through four-year equitization windows. The total asset turnover is a ratio of total sales and total assets.

Table 3.3. Variable summary and measurement for average treatment effect using propensity score matching

Variable	Coding	Measurement	Reference
P(1) Profitability	$dROA_i$	ROA change through four-year equitization windows; Return on Assets (ROA) = Net Income / Total Assets	Huang and Song (2005), Megginson (2017b)
P(2) Operating efficiency	$dTAS_i$	TAS change through four-year equitization windows Total Assets Turnover (TAS) = Total Sales/ Total Assets	Huang and Song (2005), Megginson (2017b)

Source: Appendix 2

This research also uses the total assets turnover proposed by Huang and Song (2005). This dissertation uses similar firm performance measures with previous studies to compare empirical results.

The author uses four-year equitization windows to calculate the mean values of firm performance measures. Harper (2002), Pham (2017), Sakr (2014), Alipour (2013), and Loc and Tran (2016) have applied different privatization windows with 2, 3, 5, or 7, 11 years before or after privatization. In this study, the author uses four-year equitization windows to calculate mean values of the above variables for each firm, and year 0 is "equitization year." By choosing four-year equitization windows, the author can assess the impact of tax incentive policy on the firm performance of equitized SOEs. According to Decree 164/2003/ND-CP, equitized enterprises would be deducted 100% of corporate income tax for two years after equitization and 50% of corporate income tax for the following two years after equitization. After that, the Ministry of Finance issued Circular 134/TT-BTC guiding Decree 24/2007/ND-CP after December 2007. Using four-year equitization windows also reflects the equitization characteristics in Vietnam that previous studies in Vietnam have not considered, typically works by Tran *et al.* (2015), Hung *et al.* (2017).

The author calculates mean values of performance measures in the pre-and post-equitization windows first. For example, when the author uses ROA as one performance measure for the profitability of firm *i*, the formula can be as follows:

$$\mathrm{ROA_{i0}} = \frac{(\mathrm{ROA_{i(t-4)}} + \mathrm{ROA_{i(t-3)}} + \mathrm{ROA_{i(t-2)}} + \mathrm{ROA_{i(t-1)}})}{4}$$

$$\mathrm{ROA_{i1}} = \frac{(\mathrm{ROA_{i(t+1)}} + \mathrm{ROA_{i(t+2)}} + \mathrm{ROA_{i(t+3)}} + \mathrm{ROA_{i(t+4)}})}{4}$$

Where $\mathrm{ROA_{i0}}$ is the mean value of ROA for firm *i* before equitization and $\mathrm{ROA_{i1}}$ is the mean value of ROA for firm *i* after equitization. Then, ROA change of firm *i* through four-year equitization windows can be as follows:

$$\mathrm{dROA_i} = \mathrm{ROA_{i1}} - \mathrm{ROA_{i0}}$$

After calculating all mean values of firm performance measures, the author uses the DID method to calculate all firm performance measure changes (dROA and

dTAS). After that, the author can use some estimation methods, t-Test for changes in mean values, the average treatment effect through PSM, and multiple regression methods to evaluate the impact of equitization on firm performance changes.

To classify samples into subsamples average state ownership rates after equitization in Vietnam, the author bases on actual relevant regulations in Vietnam. According to Decision 22/2021/QD-TTg, the Government classifies SOEs based on the average state ownership after restructuring to classify average state ownership into three groups, including SOEs with 100% state ownership, SOEs from 65% up to 100% state ownership, SOEs from 50% up to 65% state ownership. In this dissertation, the author classifies samples into five different remaining state ownership groups of below 20%, 20% up to 30%, 30% up to 50%, 50% up to 65%, 65% up to 100%. The author uses 50% average state ownership rate to test the necessity of state control over equitized SOEs.

To classify samples into subsamples of industry groups after equitization in Vietnam, the author also uses actual relevant regulations in Vietnam. This dissertation classifies SOEs into industry groups based on Decision 10/2007/QD-TTg issued on January 23rd, 2007, and Decree 75/ND-CP of the Government dated October 27th, 1993. In general, these two regulations differ only in updating some specific industries. This research topic includes equitized enterprises in the period of 2006-2015, so it has not yet applied Decision 27/2018/QD-TTg to classify SOEs. According to Decision 22/2021/QD-TTg, the Government maintain 100% state ownership for SOEs in key sectors. This dissertation only classifies samples into 03 subsamples of industry groups, including agriculture, forestry and fishery, manufacturing and construction and service due to two reasons. First, due to data limitations, the author only can classify samples into subsamples of industry groups to ensure research results. Second, Decision 10/2007/QD-TTg and Decree 75/ND-CP have one common point is that they classify firms in three general industries, including agriculture, forestry and fishery, manufacturing and construction and service.

To classify large and small and medium enterprises, the author bases on criteria in the Decree 56/2009/ND-CP issued on June 30rst, 2009 and Decree 90/2001/ND-CP issued on Nov 23rd, 2001 in Vietnam.

Classification variables of average state ownership rates after equitization (STATEid) and industry groups (INDid) are applied to classify samples into subsamples. After that, the author applies $dROA_i$ and $dTAS_i$ variables to solve from the first to the third research gaps based on average treatment effect through propensity score matching.

3.3.2 Variable description to evaluate how tax incentives and listing affect firm performance changes

For the regression method, previous empirical studies only apply the regression method to assess the impact of privatization and other factors on profitability and operating efficiency. Empirical studies have not used some variables, such as employment, leverage, and sales, because they may affect profitability and operating efficiency. Empirical studies often use these variables, such as employment, leverage, and sales as control variables. Also, Rakhman (2018) only applies profitability (ROA) and operating efficiency (TAS) for firm performance using the regression approach. Thus, this study applies two firm performance measures as dependent variables for the regression approach.

Dependent variables

(1) Change in profitability ($dROA_i$);

(2) Change in operating efficiency ($dTAS_i$)

These measures are calculated, as mentioned above.

Explanatory variables

Change in percentage of state ownership ($dSTATE_i$) can measure the impact of equitization on firm performance, and this variable is measured through the change in percentage of state ownership in four-year equitization windows. Huang and Xiao (2012) and Rakhman (2018) use state ownership change after privatization as a variable explaining firm performance changes. Huang and Xiao (2012) explain that privatization leads to state ownership change after privatization and this change affects firm performance.

Tax incentives ($TAXAD_i$) is a dummy variable to represent how tax incentives impact firm performance. Radygin (2014) and Aslund (2013) also conclude that many countries have different privatization policies to foster privatization progress, leading to improving firm performance after privatization. However, few empirical studies have been done to evaluate how tax incentives or incentive policies of privatization programs impact privatized SOEs' firm performance. The Vietnamese Government also issued Decree 164/2003/ND-CP on December 22rd, 2003, detailing the Law on Enterprise Income Tax (CIT) with tax incentives for equitized SOEs from 2006 to 21st, March 2007. Based on these Decrees, the author classifies equitized SOEs with and without tax incentives in Vietnam.

Listing status ($LIST_i$) is a typical characteristic of equitized SOEs in Vietnam after equitization. Listing status is a dummy variable (1 if equitized SOEs are listed within four years after equitization and 0 otherwise).

Change in the natural logarithm of the average total employees during four-year equitization windows ($dLNEMPL_i$): In Vietnam, Tran et al. (2015) also apply the change in the number of employees as one control variable for firm size due to VGSO data availability, which is also one important measure to identify firm size in Vietnam. Rakhman (2018) has applied leverage, the operating year of SOEs, and sale growth as control variables when evaluating how privatization impacts firm performance.

Change in average leverage ($dLEV_i$) also affects firm performance. Using debt can affect firm performance measures and the efficiency of equitized SOEs in general. Rakhman (2018) explains that leverage can affect firm performance (ROA) and sales efficiency.

The natural logarithm of the operating year of SOEs ($LNAGE_i$): The operating year of SOEs still privatization year also can affect firm performance (Rakhman, 2018).

Change in average sales growth ($dGROWTH_i$) can affect the firm performance of equitized SOEs. The growth rate can be measured through the growth rate of profit

or sales. Using average sales growth helps evaluate how firm size growth rate affects equitized SOEs' firm performance after equitization (Rakhman, 2018).

Industry (IND_1 and IND_2) is also one critical factor to consider when evaluating the equitization impact on firm performance. Firms in the same industry group have similarities in operation, competitive advantage and legal mechanism. Bachiller (2012) finds that only firm performance in the utility industry is significantly better after European privatization. Industry groups can be also applied as one control variable to evaluate the privatization impact on firm performance (Rakhman, 2018).

Equitization phases (PHASE) should be considered as one control variable in the model. A prominent feature of equitization in Vietnam is that the process is taking place in three main phases. This research data includes enterprises equitized from 2006 to 2015 and should include firms equitized in phase 2 and phase 3 in Vietnam. Table 3.4 represents the variable summary and measurement of multiple regression.

$dSTATE_i$ shows the impact of equitization on firm performance changes after equitization through state ownership changes. $TAXAD_i$ variable is applied to solve the fourth gap explaining the impact of tax incentive policy on firm performance changes. Besides, $LIST_i$ variable solves the fourth gap explaining firm improvement differences between listed and unlisted firms after equitization

Table 3.4. Variable summary and measurement for multiple regression

Variable	Coding	Measurement	Reference
Dependent variables			
P(1) Profitability	$dROA_i$	ROA change through four-year equitization windows; Return on Assets (ROA) = Net Income / Total Assets	Huang and Song (2005) Megginson (2017b)
P(2) Operating efficiency	$dTAS_i$	TAS change through four-year equitization windows Total Assets Turnover (TAS) = Total Sales/ Total Assets	Huang and Song (2005) Megginson (2017b)
Explanatory variables			

Change in percentage of state ownership	$dSTATE_i$	Change in percentage of state ownership through four-year equitization windows	Rakhman (2018) The new public management theory The efficient market theory
Tax incentives	$TAXAD_i$	A dummy variable that takes the value of 1 if equitized SOEs have tax incentive advantage after equitization and 0 otherwise	Welfare economics theory
Listing status	$LIST_i$	A dummy variable (1 if equitized SOEs are listed within four years after equitization and 0 otherwise)	The life cycle and market-timing theories
Firm size	$dLNEMPL_i$	Change in the natural logarithm of the average total employees during four-year equitization windows	Tran et al. (2015)
Leverage	$dLEV_i$	Change in the average leverage during four-year equitization windows	Rakhman (2018)
Age	$LNAGE_i$	The natural logarithm of the operating year of SOEs	Rakhman (2018)
Growth	$dGROWTH_i$	Change in the average sales growth during four-year equitization windows	
Industry	IND_1 and IND_2	A dummy variable, there are two dummy variables of the industry since the sub-sample includes SOEs with three industries (IND1 and IND2)	Rakhman (2018)
Equitization phase	PHASE	A dummy variable (1 if firms equitized the second phase and 0 in the third phase)	Equitization progress in Vietnam

Source: Appendix 2

3.3.3 Variable description for underpricing

3.3.3.1. Underpricing in the short run

In this dissertation, the author applies the measures of underpricing from previous studies by Adjasi *et al.* (2011), Aggarwal *et al.* (1993), Ritter (1991) and Ahmad-Zaluki and Kect (2012).

The short-run underpricing is denoted AR_i and $MAAR_i$

$$AR_i = R_i - R_{mi}$$

$$MAAR_i = 100 \times \left\{\left[\frac{1 + R_i}{1 + R_m}\right] - 1\right\}$$

Where R_i is the raw first-day returns of stock *i* (through IPOs) and determined as follows:

$$R_i = \frac{P_{first} - P_{offer}}{P_{offer}}$$

Where P_{first} is the closing price of stock *i* on the first trading day;

P_{offer} is the average IPO offer price; R_{mi} is the market return on the first trading day and can be determined through this formula:

$$R_{mi} = \frac{VN_{first} - VN_{offer}}{VN_{offer}}$$

Where VN_{first} is the market index on the first trading day;

VN_{offer} is the market index on the IPO day;

3.3.3.2. Underpricing in the long run

For the long-run underpricing, the author applies AR_t and $CAR_{q,s}$, the average benchmark-adjusted return on a portfolio of *n* stocks for month *t* can be as follows:

$$AR_t = \frac{1}{n}\sum_{i=1}^{n} AR_{it}$$

The benchmark–adjusted return of stock *i* in the month *t* can be calculated as follows:

$$AR_{it} = r_{it} - r_{mt}$$

We can identify the cumulative benchmark-adjusted long-run performance from month *q* to month *s* as follows:

$$CAR_{q,s} = \sum_{t=q}^{s} AR_t$$

Different from the empirical study by Tran et al. (2014), this dissertation calculates the monthly stock return and monthly market return when identifying long-run IPO underpricing.

The short-run underpricing variables (AR_i, $MAAR_i$) and the long-run underpricing variables (AR_t, $CAR_{q,s}$) help the author solve the final research gaps.

3.4 Data collection and description

3.4.1 Data

This research uses a probability sampling method to choose all SOEs equitized from 2006 to 2015 and 418 non-equitized SOEs in the same period from VGSO. Then, the author compares with the information about equitized enterprises of the Steering Committee of Enterprise Innovation and Development along with the elimination of enterprises with missing data in the four years before and after equitization. The author eliminates about 5 enterprises with outlier phenomena from the study (due to high negative ROA and high TAS values). Finally, the author keeps 295 equitized SOEs from 2006 to 2015 and 418 non-equitized SOEs in the same period. After identifying propensity scores, the author keeps 295 equitized SOEs from 2006 to 2015 and 414 non-equitized SOEs in the same period for the total sample.

There are three data selection criteria, including (1) Equitized SOEs in the second and the third equitization phase in Vietnam; (2) Equitized SOEs with enough firm performance information for variable measurement; (3) equitized SOEs from 2006 to 2015 to ensure calculation of four-year equitization windows.

The sample includes equitized SOEs in the second and third equitization phases in Vietnam. According to the Vietnamese Steering Committee for Enterprise Renovation and Development (2021), the Vietnamese Government conducted equitization through three phases, and the first phase took place from 1992 to 2000, with 558 equitized SOEs. In the second phase (from 2001 to 2010). The third phase lasted from 2011 up to now. Most of the equitized SOEs were large-scale enterprises with a wide range of branches and financial structure complexity in the second and the third equitization phases. Based on the above reasons, this paper contributes to the existing equitization reality in Vietnam compared with previous studies.

Table 3.5 Summary of data source according to five research gaps

No.	Data source	Summary of research gaps
1	Firm performance data are collected from VGSO. (295 equitized SOEs from 2006 to 2015 and 414 non-equitized SOEs)	The impact of equitization on firm performance changes of equitized SOEs compared with non-equitized SOEs (1)
2	Firm performance data are collected from VGSO. (295 equitized SOEs from 2006 to 2015 and 414 non-equitized SOEs)	The impact of equitization on firm performance changes of equitized SOEs compared with non-equitized SOEs by different average state ownership after equitization (2)
3	Firm performance data are collected from VGSO. (295 equitized SOEs from 2006 to 2015 and 414 non-equitized SOEs)	The impact of equitization on firm performance changes of equitized SOEs compared with non-equitized SOEs according to industry groups (3)
4	Listing data are collected from HNX, HOSE and SSC (The state securities commissions of Vietnam) Firm performance data are collected from VGSO. (295 equitized SOEs from 2006 to 2015)	The impact of tax incentive policy on firm performance changes Firm improvement differences between listed and unlisted firms after equitization. (4)
5	Stock prices, market index and IPO data are collected from HNX, HOSE and SSC (The state securities commissions of Vietnam) (112 equitized SOEs)	Underpricing (5)

Source: Author's data collection

The dissertation chooses enterprises to be equitized from 2006 to 2015 for two reasons: (1) Enterprises in the sample include equitized enterprises in the second and the third equitization phase in Vietnam. Most of the participants are medium-sized and large-scale SOEs, so research results will have many practical contributions. In the coming time, most of the remaining non-equitized SOEs are of medium and large scale ones; (2) The selection of equitized enterprises from 2006 to 2015 helps to calculate firm performance up to 2019 (currently taking 4 years before and 4 years after equitization and GSO data is only up to 2019 at present). This dissertation also uses data from HNX, HOSE and SSC (The state securities commissions of Vietnam) for listing, Stock prices, market index and IPO data as indicated in Table 3.5.

3.4.2 Data collection

There are some sufficient steps for data collection. First, the author identifies the number of equitized SOEs based on the list of the Steering Committee of Enterprise Innovation and Development. Equitized SOEs must include firms going public for the first time, and non-equitized SOEs must be firms without participating in equitization in the same periods. Second, the author checks again with survey data from the General Statistics Office of Vietnam to make sure there is enough firm performance information. Finally, the author filters data from the General Statistics Office of Vietnam to calculate suitable firm performance measures.

The dissertation adopts firm performance data from 2002 to 2019 to measure firm performance. Data are in the form of repeated cross-section data with two 'period' windows (pre-and post-equitization). The performance measures are calculated in average values for four years before and after equitization. There is a lack of genuine panel data in many countries where specific individuals or firms are followed over time.

The dissertation takes the average value up to 4 years before and after equitization and then uses the difference in value changes, so after two stages of calculation, the possibility of outliers is low. In addition, the author has excluded about 5 enterprises with outliers phenomenon from the study (due to high negative ROS, ROE values). So outliers are less likely to influence the study results in general.

The author also collects data from HNX, HOSE and SSC (The state securities commissions of Vietnam) for listing, Stock prices, market index and IPOs data.

3.4.3 Data description

After eliminating some SOEs with inadequate information, the initial data includes 295 equitized SOEs in 2006-2015 and 418 non-equitized SOEs in the same period.

Table 3.6 Number of non-equitized and equitized state-owned enterprises

No. of enterprises	Frequency	Percentage (%)	Cumulative percentage (%)
Before applying PSM			
Non-equitized SOEs	418	58.63	58.63
Equitized SOEs	295	41.37	100.00
Total	713	100.00	
After applying PSM			
Non-equitized SOEs	414	58.39	58.39
Equitized SOEs	295	41.61	100.00
Total	709	100	

Source: Author's data analysis

Using criteria of firm size, the number of operating years, equitization year, and industry to identify common support areas, the author eliminates four observations (four non-participating enterprises) to satisfy the balancing property.

Table 3.7. Equitization year

Equitization year	Non-equitized SOEs		Equitized SOEs	
	No. of enterprises	Percentage (%)	No. of enterprises	Percentage (%)
2006	151	36.47	99	33.56
2007	84	20.29	43	14.58
2008	10	2.42	16	5.42
2009	24	5.8	12	4.07
2010	10	2.42	13	4.41
2011	6	1.45	4	1.36
2012	5	1.21	2	0.68
2013	60	14.49	27	9.15
2014	35	8.45	44	14.92
2015	29	7.00	35	11.86
Total	414	100	295	100.00

Source: Author's data analysis

Table 3.7 shows that most SOEs are chosen in 2006 with 99 firms (33.56%), followed by the number of equitized SOEs in 2014 with 44 enterprises (accounting for 14.92%). This statistical result reflects the fact that most enterprises were equitized in 2006 and 2015. The author also chooses non-equitized enterprises concerning equitized SOEs from 2006 to 2015, and the total number of selected enterprises in the sample includes 295 equitized enterprises and 414 non-equitized enterprises in the same period.

Table 3.8. Frequency statistics of equitized state-owned enterprises

Characteristics	Freq.	Percentage (%)	Cum. Percentage (%)
Firm size			
Small and medium-sized SOEs	66	22.37	22.37
Large scale SOEs	229	77.63	100.00
Listing status			
Unlisted	183	62.03	62.03
Listed	112	37.97	100.00
Tax incentives			
Without tax incentives	180	61.02	61.02
With tax incentives	115	38.98	100.00
Industry groups (INDid)			
Agriculture, forestry and fishery	13	4.41	4.41
Manufacturing and construction	154	52.20	56.61
Service	128	43.39	100.00
Average state ownership after equitization (STATEid)			
<20%	53	17.97	17.97
20% up to 30%	41	13.90	31.86
30% up to 50%	97	32.88	64.75
50% up to 65%	52	17.63	82.37
65% up to 100%	52	17.63	100.00
Total	53	17.97	

Source: Author's data analysis

Among 295 equitized enterprises, only 112 firms are listed on the stock market (accounting for 37.97%). As reported by the Ministry of Finance (2020), 755 equitized SOEs were not listed/registered for trading on the stock market up to August 31rst, 2019. The reason for the listing delay is that several enterprises operate inefficiently. In general, the statistical results also show that most equitized SOEs are unlisted with 183 enterprises (accounting for 62.03%).

Table 3.8 shows frequency statistics of equitized SOEs based on industry groups, firm size, listing status, tax incentives, and average state ownership after equitization. Based on these classifications, the author will analyze equitization's impact on firm performance of equitized SOEs in different groups. The statistical results from Table 3.8 show that most equitized SOEs are in the manufacturing and

construction industries with 154 enterprises (accounting for 52.2%), followed by equitized SOEs in the service sector, including 128 enterprises.

One difference of this study compared with the studies by Tran *et al.* (2015), Nhan and Son (2017), Hung *et al.* (2017) is that equitized SOEs include SOEs equitized in the second and the third privatization phases in Vietnam, in which large-scale enterprises account for the majority with 229 enterprises (accounting for 77.63%).

Table 3.9. Descriptive statistics of firm performance changes for equitized state-owned enterprises

Variable	Obs	ROApre		ROApost		TASpre		TASpost	
		Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.
Firm size									
Small and medium-sized SOEs	66	0.002	0.105	0.0189	0.041	0.002	1.834	1.687	2.109
Large scale SOEs	229	0.024	0.071	0.042	0.066	1.247	1.281	1.174	0.061
Listing status									
Unlisted	183	0.015	0.091	0.031	0.063	1.372	1.725	1.301	1.402
Listed	112	0.026	0.059	0.047	0.059	1.389	1.658	1.270	1.354
Tax incentives									
Without tax incentives	180	0.021	0.095	0.034	0.064	1.431	1.989	1.242	1.505
With tax incentives	115	0.016	0.049	0.041	0.059	1.297	1.098	1.363	1.166
Industry groups									
Agriculture, forestry and fishery	13	0.032	0.060	0.057	0.067	0.872	0.565	1.285	1.657
Manufacturing and construction	154	0.006	0.071	0.033	0.056	1.014	0.603	1.063	0.756
Service	128	0.034	0.090	0.040	0.068	1.869	2.402	1.562	1.826
Average state ownership after equitization									
<20%	53	-0.011	0.102	0.033	0.087	1.582	2.438	1.243	1.166
20% up to 30%	41	0.002	0.063	0.036	0.057	1.388	1.221	1.165	0.672
30% up to 50%	97	0.019	0.064	0.046	0.056	1.420	1.587	1.544	1.519
50% up to 65%	52	0.030	0.039	0.031	0.055	1.276	1.477	1.143	1.649
65% up to 100%	52	0.053	0.109	0.031	0.052	1.187	1.534	1.106	1.417

Source: Author's data analysis

According to Table 3.9, the author analyzes descriptive statistics of firm performance changes for equitized SOEs before testing firm performance changes in chapter 4. High standard deviations from table 3.9 show that equitized SOEs do not have similar ROA and TAS in the pre-post comparison periods and these values fluctuate so much. Based on the mean values, small and medium-sized SOEs tend to reduce ROA

after equitization but large-scale SOEs tend to increase ROA after equitization in Vietnam. Small and medium-sized firms can not compete with private firms in similar sectors after equitization and these firms are not likely to change technology after equitization to be efficient in profitability. To test firm performance improvements, the author applies the t-Test for mean changes and Mann Whitney test for median changes in chapter 4.

Table 3.10. Frequency statistics of non-equitized state-owned enterprises

Characteristics	Freq.	Percentage (%)	Cum. Percentage (%)
Firm size			
Small and medium-sized SOEs	214	51.69	51.69
Large scale SOEs	200	48.31	100.00
Listing status			
Unlisted	414	100	100
Listed	0	0	0
Industry groups			
Agriculture, forestry and fishery	48	11.59	11.59
Manufacturing and construction	197	47.58	59.18
Service	169	40.82	100.00
Total	414	100.00	

Source: Author's data analysis

Table 3.10 shows frequency statistics on the number of non-equitized SOEs based on firm size, listing status and industry groups. Results show that the number of small and medium-sized SOEs is similar to the number of large-scale SOEs for non-equitized SOEs. All non-equitized SOEs are not listed on the stock market and this reflects the reality in Vietnam that there is a limited number of listed firms on the stock market. Most SOEs belong to the manufacturing and construction sector and service sector.

Table 3.11 shows that the majority of enterprises are in the field of service and manufacturing and construction. Also, the IPO enterprises are large ones with 103 enterprises (accounting for 91.96%). Also, the author classifies the sample into two groups before and after the financial crisis of 2008 to see the effect of this event on underpricing.

Table 3.11. Statistics on the number of enterprises conducting initial public offering by sector, firm size and financial crisis event

Classification	Freq.	Percentage	Cum. percentage
Sector			
Agriculture, forestry and fishery	7	6.25	6.25
Manufacturing and construction	51	45.54	51.79
Service	54	48.21	100.00
Firm size			
Small and medium-sized SOEs	9	8.04	8.04
Large scale SOEs	103	91.96	100.00
Financial crisis 2008			
Before 2008	51	45.54	45.54
After 2008	61	54.46	100.00

Source: Author's analysis

Table 3.11 shows frequency statistics on 112 listed firms from a sample of 295 equitized SOEs because most equitized firms are not listed after equitization in Vietnam.

3.5 Estimation methods

3.5.1 Average treatment effect through propensity score matching

For hypotheses H1, H2 and H3, the author uses a probit model to determine propensity scores to find a control group (non-equitized SOEs) (model 1). Since then, the study uses the average treatment effect to evaluate the policy impact on the changes in the firm performance of two groups of enterprises.

(1) Estimating a model of privatization participation

According to Khandker *et al.* (2009), we can estimate a model of program participation based on a multinomial logistic or probit model. Propensity score matching constructs a statistical comparison group using a model of the probability of participating in the treatment using observed characteristics. The dependent variable is the participation dummy (equitization or non- equitization). Independent variables include four variables proposed by Tran *et al.* (2015) and Loc and Tran (2016), including firm size (natural logarithm of total real assets), the number of operating years, industry, and privatization year. The probit model can be applied to estimate the propensity score based on model (1).

(2) Matching participants to nonparticipants

Nearest-neighbor matching is the most frequently used matching technique where each treatment unit is matched to the control unit using the closest propensity score.

K-neighbor matching (psmatch): One problem with nearest neighbors matching is that the difference in propensity scores for a participant and its closest nonparticipant neighbor may be high. So, this dissertation chooses n nearest neighbors and does matching (n = 5 is used) for robustness testing.

(3) Estimating the impact of the equitization program using a difference-in-difference matching estimator using the estimation model (2, 3 and 4).

3.5.2 Ordinary least square

For hypotheses H4, this study also uses the regression approach of ordinary least squares (OLS) to evaluate the impact of tax incentive policy of the equitization program on firm performance changes and how and listing status impacts on firm performance changes after equitization. The research data in the topic is arranged in repeated cross-sectional data, so applying the OLS regression model is the most appropriate. There is a lack of panel data in many countries where specific individuals or firms are followed over time. In this case, repeated cross-sectional surveys are available to solve this problem, where a random sample is taken from the population at consecutive points in time (Verbeek, 2008).

The general linear regression model is written as:

$$Y_i = \alpha_0 + \alpha_1 X_{1i} + \alpha_2 X_{2i} + \cdots \alpha_k X_{ki} + U_i$$

Where Y_i is the dependent variable, $X_{1i},\ldots X_{ki}$ can be independent variables.

Ordinary least square (OLS) is a popular regression method in the research world. This method estimates the explanatory variables' coefficients on the mean value of the dependent variable according to the principle of minimizing the sum of squares of the model's residuals. The residuals are differences between actual values and the predicted values of the dependent variable. For cross-sectional data, the estimation method is the most suitable. Other estimation methods can be applied for panel data, such as the fixed-effect and random effect models.

First, the author uses the OLS method to find out the estimation regression as:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots \beta_k X_{ki} + e_i$$

Second, the author tests regression estimation assumptions. There are some tests for regression estimation assumptions, including multicollinearity, autocorrelation and heteroscedasticity (Gujarati, 2011). The multicollinearity testing can be done through correlation matrix and variance inflation factor. There is no multicollinearity when the average VIF does not exceed 10 (Gujarati, 2011). For heteroscedasticity, we use the Breusch-Pagan test to identify whether regression models violate this assumption. Regression with robust standard errors can be applied to solve heteroscedasticity. Autocorrelation exists in time series data and this dissertation has repeated cross-sectional data. Lebo and Weber (2015) explain that repeated cross-section data still have problems in autocorrelation if the number of periods is greater than 50, and there needs to apply ARFIMA-MLM model to account for autocorrelation in longer repeated cross-section followed by the use of multilevel modeling to estimate both aggregate- and individual-level parameters simultaneously. There are only ten equitization years in this research, so there is no need to consider autocorrelation (David *et al.*, 2006; Moy *et al.*, 2006; Stroud, 2008).

3.5.3 t-Test for underpricing phenomenon

After calculating IPO short-run and long-run returns, the author applies t-Test to identify whether IPO short-run returns and long-run returns are greater than zero (hypothesis 5). There are some sufficient steps for the t-Test. *First*, the author calculates the underpricing values. *Second*, the author applies the t-Test to test whether IPO short-run returns and long-run returns are greater than zero. This dissertation also applies t-Test for firm performance measure changes. Due to data limitations, this dissertation does not examine the impact of underpricing on firm performance changes because most equitized SOEs are unlisted after equitization, leading to being unable to calculate underpricing for the full sample.

3.6 Summary of chapter 3

The content of chapter 3 includes hypothesis development, research models, variable measurement, data collection and description and estimation methods. The research hypotheses include five main ones according to research objectives:

(1) Hypothesis to examine the impact of equitization on firm performance changes of equitized SOEs and non-equitized SOEs in the same periods (H1).

(2) Hypothesis on the impact of equitization on firm performance of equitized SOEs compared with non-equitized SOEs by average state ownership rates after equitization (H2).

(3) Hypothesis on the impact of equitization on firm performance of equitized SOEs compared with non-equitized SOEs according to industry groups (H3).

(4) Hypothesis on the impact of tax incentives on firm performance changes and firm performance changes between listed and unlisted firms (H4).

(5) A hypothesis to evaluate the underpricing phenomenon of equitized SOEs through IPOs (H5).

The author has represented three main estimation methods, including t-Test for underpricing, average treatment effect through propensity score matching and ordinary least square methods. Chapter 4 will analyze the firm performance of equitized SOEs in the pre-post equitization periods and quantitative research results.

Chapter 4. RESEARCH RESULTS

This chapter analyzes firm performance in the pre-post equitization windows by total sample and by specific groups after equitization. This chapter also presents model estimation results and tests the impact of equitization on firm performance changes.

4.1 Firm performance of equitized state-owned enterprises in the pre-post equitization periods

This section summarizes the descriptive statistical results and examines firm performance in the pre-and post-equitization periods. Then, the author uses the t-Test for firm performance changes to initially consider whether equitization has a significant impact on the firm performance of participating firms.

4.1.1 Descriptive statistics

Table 4.1 represents descriptive statistics for firm performance measures for data in the dissertation.

Table 4.1. Descriptive statistics of firm performance measure changes

Variables	Non-equitized SOEs		Equitized SOEs	
	Mean	Std	Mean	Std
dROA	0.005	0.088	0.018	0.092
dTAS	0.012	1.006	-0.089	1.117
AGE	21.162	8.827	21.081	11.543
ASSETe	388,552.7	1,286,468	665,836.1	3,590,453
n		414		295

Source: Author's data analysis

Descriptive statistics from Table 4.1 show that SOEs generally have a significant difference in firm size in equitization years with the highest standard deviation. Results show that SOEs have a different firm size in terms of assets. Using a sample of large-scale SOEs is also the practical contribution of this study because previous studies in Vietnam mainly focus on small and medium-sized SOEs (SOEs equitized in the first and second stages). Also, the statistical results show that SOEs' firm performance changes are high, and most of the changes in firm performance measures have positive values. Calculating underpricing needs IPOs prices and the first trading day prices. Thus, the author only

calculates underpricing for 112 equitized SOEs being listed on the stock market in Vietnam.

Table 4.2. Descriptive statistics of underpricing

Variable	Obs	Mean	Std. Dev.	Min	Max
AR_i	112	10.306	87.820	-213.047	419.167
$MAAR_i$	112	25.347	90.922	-96.942	518.564

Source: Author's data analysis

Descriptive statistics from Table 4.2 show that firms have different underpricing levels based on AR_i (%) and $MAAR_i$ (%). Firms have high underpricing and underpricing is highly dispersed (standard deviation of AR_i is 87.82% and standard deviation of $MAAR_i$ is 90.922%).

4.1.2 General firm performance of equitized state-owned enterprises

First, the author summarizes the mean values of firm performance of SOEs equitized from 2006 to 2015. One difference of this study compared with the studies by Tran *et al.* (2015), Hung *et al.* (2017) is that equitized SOEs in the sample include SOEs equitized in the second and the third privatization phases in Vietnam.

Figure 4.1 provides information on the change in the mean value of profitability (change in ROA) over pre-post equitization windows. Meanwhile, Table 4.3 shows statistical testing information about the t-Test and Mann-Whitney test on firm performance changes through pre-post equitization windows. Firm profitability (ROA) generally tends to increase after equitization for SOEs equitized from 2006 to 2015.

ROA also decreased for enterprises equitized in 2012 (for two enterprises) from 6.8% to 3.2%. These two SOEs are Vung Tau Shipping and Services Joint Stock Company and the Housing Development and Construction Investment Company.

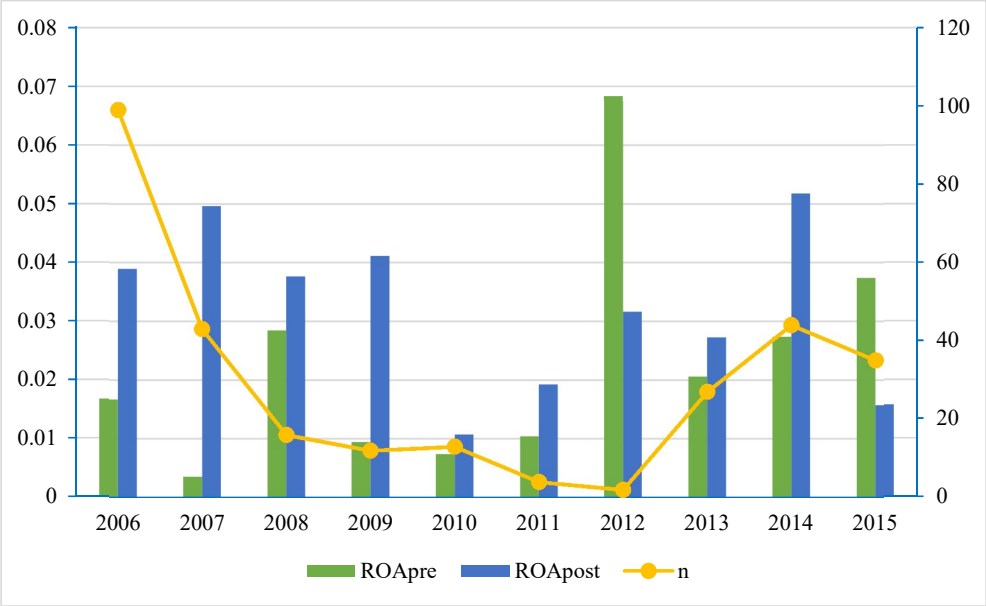

Figure 4.1. The profitability of equitized state-owned enterprises in the pre-post equitization windows

Source: Author's calculation based on data from GSO, Vietnam (2021)

Figure 4.2 shows TAS variations over time (from 1.585 to 1.299 for enterprises equitized in 2008).

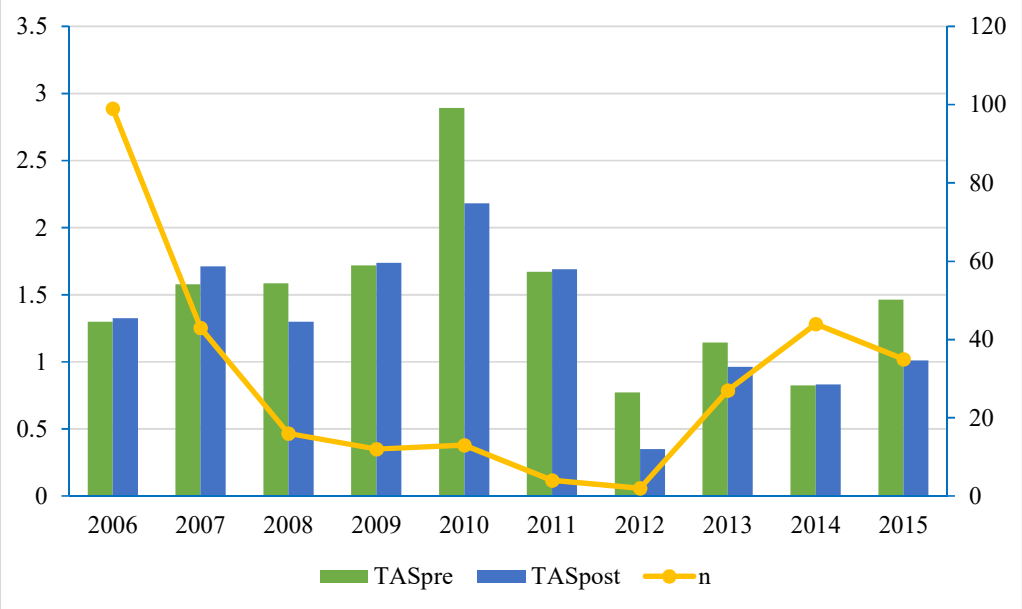

Figure 4.2. Total asset turnover (TAS) of equitized state-owned enterprises in the pre-post equitization windows

Source: Author's calculation based on data from GSO, Vietnam (2021)

Enterprises tend to reduce operating efficiency due to two reasons, including (1) the Economic crisis in 2008 had a significant impact on the firm performance; (2) The equitized enterprises after 2008 were mostly medium and large.

In general, the descriptive statistical results from Table 4.3 show that enterprises have significant changes in firm performance after equitization.

4.1.3 Firm performance changes of equitized state-owned enterprises

4.1.3.1 Firm performance changes of equitized state-owned enterprises for the whole sample

The author also uses a pre-post comparison method with t-Test for mean changes and Mann Whitney test for median changes.

Table 4.3. Firm performance changes of equitized state-owned enterprises

Obs	ROA			TAS		
	Mean/ median before	Mean/ median after	Mean/ Median change	Mean/ median before	Mean/ median after	Mean/ Median change
590	0.019	0.037	0.018**	1.379	1.289	-0.09
	0.011	0.023	0.012***	0.964	0.957	-0.007

Note: *,* and *** denote significant levels at 10%, 5% and 1%.

Source: Author's data analysis

Profitability

According to the t-test, equitized enterprises have a significant increase in profitability (ROA increased by 1.8%). Vietnamese Government has issued tax incentive policies and land lease incentives, which also help equitized SOEs reduce costs and re-invest more effectively. These results show that SOEs have improved profitability after equitization. This study's results are similar to work by Dewenter and Malatesta (2001), which show that privatized firms improved 4.6% of ROS and 1.1% of ROA after privatization (three-year privatization windows). The research results are quite similar to studies by Brown *et al.* (2016), Arcas and Bachiller (2010).

Mager and Jesswein (2010) also find that profitability increases significantly at the 5% level of ROS and ROA after privatization for the full sample while there is no significant ROE increase. Boubakri *et al.* (2008) confirm that privatized enterprises

increase profitability (ROS, ROE, and ROA) after privatization in developing countries. This study's results are quite similar to the study results by Ochieng and Ahmed (2014). However, Aussenegg and Jelic (2007) find that privatized firms experience no improvement in profitability in the Czech Republic. This study has many similarities with the studies by Farinos *et al.* (2007) in Spain. Alipour (2013) explains that privatization does not positively affect the profitability (ROS, ROE, and ROA) of the firms listed on the Tehran Stock Exchange. Oqdeh and Abu Nassar (2011) find that there is no significant increase in profitability after privatization. The State still holds a significant number of shares and dominates privatized SOE operations in China, so it is challenging to improve firm performance after privatization (Wei *et al.*, 2003).

Operating efficiency

This study's remarkable result is that equitized enterprises do not improve operating efficiency through TAS. Meanwhile, previous studies in developed and developing countries show that there is an increase in the operating efficiency of privatized enterprises (Farinos *et al.*, 2007; Huang and Song, 2005; Loc *et al.*, 2006; Loc and Tran, 2016; Mager and Jesswein, 2010).

However, this research result is quite similar to studies by Liao *et al.* (2014), Tu *et al.* (2013) explain that there is a political connection after privatization within privatized SOEs in China, making it difficult for privatized SOEs to improve their performance after privatization. Equitized enterprises do not improve operating efficiency because post-equitized enterprises do not improve their revenue after equitization.

After summarizing the mean values of firm performance measures in the pre-post equitization periods from 2006 to 2015, the author analyzes mean values in the pre-post equitization periods and changes in firm performance measures in different groups.

4.1.3.2 Firm performance changes of equitized state-owned enterprises by specific groups

Table 4.4 shows firm performance changes of equitized SOEs when the author classifies samples into subsamples based on firm size, listing status and tax incentives.

Table 4.4. Firm performance changes of equitized state-owned enterprises by firm size, listing status and tax incentives

Classifications	Obs	ROA			TAS		
		Mean/ median before	Mean/ median after	Mean/ Median change	Mean/ median before	Mean/ median after	Mean/ Median change
Firm size							
Small and medium-sized SOEs	132	0.002 0.007	0.019 0.012	0.017 0.005	1.834 1.046	1.687 1.000	-0.147 -0.046
Large scale SOEs	458	0.024 0.012	0.042 0.029	0.018*** 0.017***	1.247 0.939	1.175 0.950	-0.072 0.011
Listing status							
Listed firms	224	0.026 0.013	0.047 0.037	0.021*** 0.024***	1.389 0.923	1.271 1.013	-0.118 0.09
Unlisted firms	366	0.015 0.008	0.031 0.017	0.016** 0.009***	1.372 .984	1.301 0.944	-0.071 -0.04
Tax incentives							
Without corporate income tax incentives	360	0.021 0.013	0.035 0.020	0.014* 0.007**	1.431 0.908	1.242 0.885	-0.189 -0.023
With corporate income tax incentives	230	0.016 0.009	0.041 0.029	0.025*** 0.02***	1.297 0.985	1.363 1.068	0.066 0.083

Note: *,* and *** denote significant levels at 10%, 5% and 1%.

Source: Author's data analysis

Analysis by firm size

Considering the firm size, small and medium-sized enterprises do not improve firm performance after equitization (Table 4.4). Thus, equitization does not help small and medium-sized enterprises improve their performance, and these enterprises are often in the agriculture, forestry and fishery sectors with a low competitive business environment. However, large-scale SOEs are likely to improve their

performance after equitization. Large-scale enterprises improve profitability (ROA increased by 1.8%) (Table 4.4).

There is no evidence that both small and medium-sized enterprises and large-sized enterprises tend to improve operating efficiency (TAS) after equitization in Vietnam. The fluctuation in enterprises' sales after equitization depends on operational objectives, operational strategies, and macroeconomic conditions

Large-sized enterprises are often state-owned corporations but belong to highly competitive industries, so they operate more effectively after equitization.

Analysis by listing status

The listing delay within four years after equitization is a typical feature of enterprises after equitization in Vietnam. Most privatized SOEs are listed after privatization in developed countries. In China, listing delay is also not popular because of strict regulations from the Chinese Government.

The statistical results from Table 4.4 show that the average value of firm performance tends to be higher after equitization. Both listed and unlisted firms improve profitability after equitization in Vietnam (ROA of listed firms increased by 2.1% at 5% significance level and ROA of unlisted firms increased by 1.6% at 5% significance level). However, both groups do not have an improvement in operating efficiency (TAS).

Thus, in terms of the research sample, the performance measures have changed after equitization, but when using t-Test to infer the whole population, only ROA measures have been improved after equitization for both groups.

Analysis by tax incentives

Statistical results in Table 4.4 show that enterprises conducting equitization from 2006 to 21st March 2007 are entitled to corporate income tax incentives according to Article 33 of Decree 164/2003/ND-CP issued on December 22, 2003. Therefore, these equitized SOEs have a significant improvement in profitability (ROA). There is no improvement in operating efficiency (TAS) after equitization. This result also shows that equitized SOEs with tax incentives have a stable operation (reflected by improved profitability measures after equitization).

The results from Table 4.4 show that both equitized enterprises with tax incentives and without incentives for corporate income tax have an increase in profitability (dROA) but there is no improvement in operating efficiency after equitization for both groups in Vietnam. This result is inconsistent with the studies by Aussenegg and Jelic (2007), Wei et al. (2003), Carlin and Pham (2009), Pham (2017), and Pham and Nguyen (2019). Farinos et al. (2007) find no significant improvements in Spanish privatized firms' profitability and operating efficiency. Wei et al. (2003) argue that firms do not significantly increase profit after privatization in China. Chen et al. (2006) also conclude that firm profitability decreased after five years of privatization in China.

According to the new public management theory, when equitized enterprises have not yet wholly transformed into private ownership, it is not necessarily state-owned enterprises operate more efficiently after equitization because they are still subject to state control. Thus, equitized firms can not improve operating efficiency in Vietnam. These results generally coincide with studies in China, such as studies by Wei *et al.* (2003), Chen *et al.* (2006), and Zhang *et al.* (2012). These researchers explain that privatized SOEs are still under the State's control in China, so firm performance is difficult to improve in the short term. Gan (2009) also concludes that privatization does not help reduce the State's dominant role in privatized firms in China.

Analysis by industry groups

Based on results from 4.5, firm performance measures in the pre-post equitization periods by three industry groups are different. In general, firms in the third group have a higher average post-equitization value than the pre-equitization period. However, to consider whether the performance improvement is statistically significant in the overall population, the author uses the t-Test for firm performance changes in the pre-and post-equitization periods. Firms in the first industry group have higher average profitability than in the pre-equitization period. However, the change in mean value is not statistically significant, so it is impossible to conclude that firms in the first industry group have increased profitability in general. Similarly,

firms' operating efficiency in the first industry group increased compared to the pre-equitization period, but the improvement is not statistically significant.

Table 4.5. Firm performance changes of equitized state-owned enterprises by industry groups

Classifications	Obs	ROA			TAS		
		Mean/ median before	Mean/ median after	Mean/ Median change	Mean/ median before	Mean/ median after	Mean/ Median change
Industry groups							
The agriculture, forestry and fishery sectors	26	0.032 0.007	0.057 0.045	0.025 0.038	0.872 0.828	1.285 0.675	0.413 -0.153
The manufacturing and construction sectors	308	0.006 0.008	0.033 0.018	0.027*** 0.01***	1.014 0.908	1.063 0.947	0.049 0.039
The service sector	256	0.034 0.015	0.040 0.027	0.006 0.012**	1.869 1.119	1.563 1.020	-0.306 -0.099

Source: Author's data analysis

For equitized enterprises in the second industry group, firm performance is improved significantly after equitization through the t-Test. The firm profitability of the second group is increased significantly in general (ROA increased by 2.7% at 1% significance level). However, enterprises in the second sector generally do not improve their efficiency in terms of total asset turnover. Significantly, firms in the third industry group do not improve their profitability and operating efficiency after equitization.

Analysis by average state ownership after equitization

An important feature that previous studies have rarely mentioned is considering firm performance after equitization for groups of enterprises that are controlled by the State and groups without being controlled.

To categorize these two groups, the author bases on the average percentage of state ownership within four years after equitization, as presented in Table 4.6.

Table 4.6. Firm performance changes of equitized state-owned enterprises by average state ownership after equitization

Classifications	Obs	ROA			TAS		
		Mean/ median before	Mean/ median after	Mean/ Median change	Mean/ median before	Mean/ median after	Mean/ Median change
<20%	53	-0.011 0.006	0.033 0.011	0.044*** 0.005***	1.582 0.984	1.243 0.958	-0.339 -0.026
20% up to 30%	41	0.002 0.008	0.036 0.019	0.034*** 0.011**	1.388 1.023	1.165 1.017	-0.223 -0.006
30% up to 50%	97	0.019 0.010	0.046 0.032	0.027*** 0.022***	1.420 1.012	1.544 1.218	0.124 0.206
50% up to 65%	52	0.030 0.017	0.031 0.023	0.001 0.006	1.276 0.966	1.142 0.769	-0.134 -0.197
65% up to 100%	52	0.053 0.023	0.031 0.019	-0.022 -0.004	1.187 0.731	1.106 0.802	-0.081 0.071

Source: Author's data analysis

However, when considering the t-Test for changes in firm performance measures, the author found that only the non-dominant state-owned firms (state ownership rate below 50%) have statistically significant improvements in profitability after equitization. Specifically, firms with state ownership less than 20%, from 20% up to 30% and from 30% up to 50% significantly improve ROA after equitization. This group's operating efficiency is not improved through the TAS.

Thus, these results show that non-state-dominated enterprises operate more efficiently than enterprises that the State still holds over 50% of shares after equitization in general. This result is also a feature for the author to make recommendations in Chapter five.

4.1.3.3 Comments about signals of equitization impact on firm performance of equitized state-owned enterprises

Using t-Test for firm performance measure changes is the initial step in identifying whether equitization impacts the firm performance of equitized SOEs in Vietnam.

First, equitized enterprises have a tremendous difference in firm performance after equitization in terms of profitability (ROA) and operating efficiency (TAS). The results of the t-Test show that equitized enterprises do not significantly improve operating efficiency after equitization.

Second, equitized SOEs with tax incentives and without tax incentives have significant improvement in profitability (ROA). However, these firms do not improve operating efficiency (TAS).

Third, besides the economic environment, slow divestment progress also affects operating efficiency and equitized SOEs' real sales. Thus, the initial descriptive and initial t-Test statistical results have important meanings. The results show that equitized firms have statistically significant increases in profitability (ROA). Since then, the author recognizes that this is an initial signal showing the need to evaluate the impact of equitization on firm performance in chapter 4.

Finally, there are differences in firm performance measures after equitization according to tax incentives, industry groups, listing status and average state ownership after equitization. Therefore, the assessment of equitization impact on firm performance must consider the impact of equitization on firm performance according to these groups.

4.2 Quantitative research results

4.2.1 The impact of equitization on firm performance of equitized state-owned enterprises compared with non-equitized state-owned enterprises

To evaluate equitization impact on firm performance changes after equitization, the author adopts the average treatment effect through PSM using models (1, 2, 3 and 4) from chapter 3. This method evaluates the effect of equitization on firm performance changes of participating firms when considered with non-participating firms in the same period.

4.2.1.1 General results

The author uses the with-without comparison method combined with the DID method to assess the equitization effect (concerning the non-equitized firms in the same periods). Similarly, the author assesses the impact of equitization on the treatment group's firm performance (equitized SOEs) compared with the control group (non-equitized SOEs) by firm size.

Table 4.7. General average treatment effect with propensity score matching and difference-in-difference analysis

dROA		dTAS	
ATE (nnmatch)	ATE (psmatch)	ATE (nnmatch)	ATE (psmatch)
0.0143*	0.015**	-0.126	-0.061
n before PSM: 713 (418 non-equitized SOEs and 295 equitized SOEs)			
n after PSM: 709 (414 non-equitized SOEs and 295 equitized SOEs)			

Note: *,* and *** denote significant levels at 10%, 5% and 1%.

Source: Author's data analysis

Using the PSM technique, the author selects 713 enterprises, including 418 non-equitized ones and 295 equitized ones in the same periods. Conclusions are based on robustness testing results using both nnmatch and psmatch approaches.

Table 4.7 shows evidence that equitization helps enterprises improve profitability if considering ROA compared with non-equitized enterprises in the same periods. There is ROA improvement after equitization because equitized SOEs are eligible for enterprise income tax incentives, which directly affect profit after tax and lead to ROA improvement.

In general, equitization does not help enterprises improve operating efficiency if considered with non-equitized enterprises in the same period. dTAS has not been improved after equitization (Table 4.7). This result is contrary to previous studies by Loc and Tran (2016), Nhan and Son (2017). This result can also be explained by the fact that there are no changes in equitized enterprises' performance (dTAS) considering non-equitized enterprises in the same periods based on tax incentives, firm size, industry groups, listing status and average state ownership after equitization. Post-equitized enterprises in Vietnam still maintain relatively high state ownership rates within four years after equitization, making it challenging to improve operating efficiency. Equitized SOEs have not clearly distinguished between the state ownership function, and state management has led to equitized SOEs' poor performance after equitization.

4.2.1.2 Analysis by firm size

When classifying the sample by firm size, the authors classify the sample into two groups of large-scale and small and medium enterprises presented in Table 4.8. Research shows that small-medium does not improve profitability and operating efficiency compared with non-participating firms. However, large-scale SOEs can improve ROA after equitization in Vietnam. This result is consistent with the general conclusion that equitized SOEs improve profitability (dROA) compared with non-equitized SOEs in the same periods. Besides, most equitized SOEs are large-scale ones in the second and the third phase of equitization and some of them have tax incentives to improve net profit after tax after equitization.

Table 4.8 shows that equitized SOEs do not improve operating efficiency compared with non-equitized SOEs. Because enterprises participating in these two phases are mostly medium and large-sized enterprises with little change in ownership structure after equitization, few changes in operation objectives should be challenging to improve operating efficiency.

Table 4.8. Average treatment effect by firm size

Variable	Small and medium-sized SOEs				Large scale SOEs			
	ATE (1)	z-statistic (1)	ATE (2)	z-statistic (2)	ATE (1)	z-statistic (1)	ATE (2)	z-statistic (2)
dROA	0.003	0.25 (0.805)	0.021	1.09 (0.276)	0.024***	3.10 (0.002)	0.020***	3.11 (0.002)
dTAS	-0.141	-0.38 (0.703)	-0.003	-0.01 (0.990)	-0.047	-0.44 (0.657)	-0.043	-0.57 (0.569)
n before PSM	483 (414 non-equitized SOEs and 69 equitized SOEs)				640 (414 non-equitized SOEs and 226 equitized SOEs)			
n after PSM	428 (359 non-equitized SOEs and 69 equitized SOEs)				620 (394 non-equitized SOEs and 226 equitized SOEs)			

Notes : (1) stands for nnmatch approach and (2) stands for psmatch approach

Source: Author's data analysis

Research results are very consistent with reality when large-scale enterprises have high ROA compared with small and medium enterprises in Vietnam as stated in Table 4.9.

Table 4.9. Return on assets of operating firms based on firm size in Vietnam (%)

Category	2011-2015	2016-2019	2018	2019
Microenterprise	-0.9	-1.4	-1.1	-1.3
Small enterprise	-0.1	0	-0.3	-1.1
Medium enterprise	1.3	1.2	1.1	0.9
Large scale enterprise	3.7	3.7	3.6	3.4

Source: VGSO (2021)

Large-scale enterprises often have competitive advantages in markets and the ability to change technology for firm performance improvement. Large scale ones also have more advantages in raising capital for operation than small and medium ones to develop sustainably. However, there are potential risks for large-scale enterprises if they have unsuitable strategic plans and it is easy to get bankruptcy compared with small and medium ones.

4.2.2 The different impacts of equitization on firm performance of equitized state-owned enterprises compared with non-participating firms by different average state ownership rates after equitization

In this part, the author also applies the average treatment effect through PSM using models (1, 2, 3 and 4) from chapter 3. However, the author classifies the sample into three subsamples with different average state ownership after equitization.

A typical characteristic of equitized SOEs after equitization in Vietnam is very similar to China's slow divestment progress after equitization (Appendix 10).

Overall, the results from Appendix 10 show that equitization only helps firms improve profitability compared with non-participating firms (dROA) when firms are no longer under state control after equitization (average rate of state ownership after four years of equitization is less than 50%). Firms with state ownership less than 20% improve ROA (3.95% on average) after equitization and firms with state ownership from 20% up to 30% also improve ROA (2.75% on average). Also, firms with state ownership from 30% up to 50% improve ROA (2.35% on average). Research results show that there should be fast state divestment and encourage no state control so that

equitized firms can improve profitability (ROA) after equitization in Vietnam. Firms with no state control are easy to change and restructure operational activities to maximize profits.

State intervention with voting rights can result in no firm performance improvement. Firms with more than 50% of state ownership do not improve profitability over non-equitized firms in the same period. When firms have a high state ownership rate after equitization, state representatives still control these firms and interfere with important decisions within the firms. Research results from Appendix 10 also indicate that there is no evidence firms with average state ownership from 50% up to 65% can improve firm performance (both ROA and TAS). Firms with average state ownership over 65% significantly have lower firm performance (ROA) compared with non-equitized SOEs in the same period. These results imply that the Vietnamese government should foster state divestment to ensure no state control in most equitized SOEs after equitization. Governments in developing countries have conducted privatization programs to reduce state control over SOEs for innovation and firm performance. Voting rights in equitized SOEs can reduce risks of losing state capital and assets but can not encourage innovation with a very strict control mechanism.

Table 4.10 shows that state-owned enterprises have a lower ROA than foreign investment enterprises. Thus, the government should encourage strategic foreign investors to invest in equitized SOEs for firm performance improvement after equitization in Vietnam.

Table 4.10. Return on assets of operating firms based on firm type in Vietnam (%)

Category	2011-2015	2016-2019	2018	2019
State owned enterprise	3	2.2	2	2.2
Non-State enterprise	1.2	1.5	1.6	1.2
Foreign investment enterprise	5.8	6.2	5.8	5.5

Source: VGSO (2021)

According to the new public management theory, privatization is the process of transferring decision-making rights from state representatives to managers of private firms. When equitized firms still retain high state ownership, they can not operate more efficiently compared with non-equitized SOEs in the same periods.

For enterprises after the equitization, the problem here is that the State still holds a large capital proportion of 30%, 50%, even 90%, but these enterprises are still called equitized ones. Vietnam has gradual equitization and partial equitization where the State remains high state ownership in equitized SOEs with actually low divestment progress. Thus, it is difficult for equitized SOEs to improve firm performance with nearly the same ownership structure and the State intervention in strategic decisions within equitized SOEs.

Although the Vietnamese Government has reduced the number of industries, sectors that the State holds 100% authorized capital or dominant stock, the State still holds dominant shares in equitized SOEs after equitization for a long time. Through the data collected from 295 equitized enterprises in the period of 2006-2015, the author analyzes the state ownership for these equitized SOEs. The author selects enterprises during this period to determine the state ownership rates within four years after equitization.

Table 4.11. Percentage of state ownership of equitized state-owned enterprises after four equitization years in Vietnam

Variable	Obs	Mean	Std. Dev.	Min	Max	t-Test
VNNt1	295	47.812***	22.617	6	100	36.301 (0.000)
VNNt2	295	42.392***	25.214	0	99	28.877 (0.000)
VNNt3	295	38.735***	25.907	0	99	25.679 (0.000)
VNNt4	295	34.637***	25.909	0	99	22.962 (0.000)
VNNPOST	295	40.441***	23.459	0	99	29.609 (0.000)

Source: Author's data analysis

The statistical results from Table 4.11 show that the state ownership rate is decreased from 47.812% to 34.637%. Thus, the level of state divestment after

equitization in Vietnam is prolonged over the years. The t-Test result also shows that the average value of state ownership after equitization within four years of equitized enterprises is different from zero, which shows that most of the equitized enterprises in Vietnam maintain state ownership. Maintaining a high state ownership proportion after equitization makes it difficult for enterprises to change management mechanisms and operational goals to compete with private enterprises in the same industry, making enterprises have difficulties in improving operating efficiency after equitization compared with non-equitized enterprises in the same periods.

4.2.3 The different impacts of equitization on firm performance of equitized state-owned enterprises compared with non-participating firms according to industry groups

The results of Appendix 9 show that enterprises in the first group (agriculture, forestry and fishery sectors) and enterprises in the third group (service sector) do not significantly improve their firm performance compared with non-equitized SOEs in the same period (because the changes in profitability and operating efficiency are not statistically significant).

Equitized SOEs in the second sector (the manufacturing and construction sectors) have improved their profitability (dROA increased by 2.50% on average) after equitization compared with non-participating firms. However, these firms do not improve operating efficiency compared with non-participating firms.

Firms in different industries do not have similar firm performance in general because they operate in different competitive environments. This research result is consistent with statistics results from VGSO (2021) as stated in Table 4.12.

Table 4.12. Return on assets of operating firms based on industry groups in Vietnam (%)

Category	2011-2015	2016-2019	2018	2019
Agriculture, forestry and fishery	3.9	0.8	0.7	-0.1
Manufacturing and construction	4.4	4.2	3.9	3.4
Service	1.6	1.7	1.7	1.6

Source: VGSO (2021)

Firms in different industry groups do not have the same ROA values and firms in the manufacturing and construction industry group have the highest ROA if considered from 2011 to 2019. The European Union Vietnam Free Trade Agreement (EVFTA) took effect on August 1, 2020 and this agreement has created many opportunities for national firms to export agriculture, forestry and fishery to the European market. Although contributions of firms in the agriculture, forestry and fishery to GDP has been increasing by 2,71% per year from 2016 to 2017 (VGSO, 2021), these firms still have some weaknesses to improve firm performance. First, the product quality of national firms can not compete with foreign products from other firms and national firms slowly change production technology when foreign direct investment firms have dramatically changed their technologies to improve product quality and satisfy customer's needs. National firms also find it difficult to export goods to foreign countries due to low product quality and high standards in agriculture, forestry and fishery from other markets, especially the European market. Second, the production scale of firms in this industry group is too small, so it is difficult for firms to add value to products and get good prices. Many farmers have left their hometowns and started to be workers in industrial provinces like Binh Duong, Dong Nai, etc. Third, there is low labor productivity for firms in the agriculture, forestry and fishery groups. Labor productivity for these firms is even lower than labor productivity in Thailand, Malaysia and Indonesia.

Firms in manufacturing and construction have the highest ROA and research results are consistent with the reality in Vietnam. After equitization, there is private participation from foreign investors and they have enough incentives to contribute to firm development, leading to firm performance improvement. A typical example of a good performance company after equitization is Vinamilk and the company has taken advantage of new technologies and managerial experiences from strategic foreign investors to improve firm performance and develop sustainably after equitization.

However, firms in the service sector do not improve firm performance after equitization in Vietnam. Most of these firms are small-scale ones with outdated technologies and can not compete with private firms in the same industry. Table 4.12

also indicates that firms in the service sector do not have high ROA compared with firms in the manufacturing and construction industry in Vietnam.

The research result is consistent with the theory of competitive advantage and most previous empirical studies. Firms in the manufacturing industry are usually more competitive than firms in other sectors with a fast-changing trend in technology. Firms in agriculture, forestry and fishery are slow to adapt and apply technology to compete with other private firms in the same industry after equitization in Vietnam. The Vietnamese government has made efforts to reduce the number of industries, sectors that the State holds 100% authorized capital or dominant stock according to Decision 58/2016/QD-TTg to Decision 22/2021/QD-TTg. However, the Government does not have priority in choosing equitized SOEs in the manufacturing industry.

4.2.4 The impact of tax incentives on firm performance changes and firm performance changes between listed and unlisted firms

In this part, the author applies the research model (5) from chapter 3. The author first tests regression assumptions, including multicollinearity and heteroscedasticity. Then, regression results are analyzed to examine the impact of tax incentives and listing on firm performance changes. This dissertation also applies the multiple regression method to analyze how equitization impacts on firm performance of equitized SOEs with tax and without tax incentives in Vietnam. Applying the multiple regression method requires a minimum sample size based on the number of variables. Therefore, this study only analyzes the multiple regression model for all 295 observations to ensure the sample size requirement. Also, this study uses control variables as industry groups and equitization phases in the research model.

4.2.4.1 Multicollinearity testing

First, the author tests whether there is multicollinearity in multiple regression models using the variance inflation factor (VIF). Table 4.13 shows the collinearity testing results.

The multicollinearity testing results from Table 4.13 show that variance inflation factors of independent variables in the research model are less than 10, which shows no multicollinearity (Hair *et al.*, 1998). Wald testing results for heteroskedasticity show that there is heteroskedasticity (significance level <5%). According to White (1980), we can

accept heteroskedasticity if robust standard errors are applied. Therefore, the author continues to use the estimation of robust standard errors for multiple regression models.

Table 4.13. Collinearity testing

Variables	Variance inflation factor (VIF)	1/VIF
TAXAD	1.77	0.564
PHASE	1.74	0.573
dSTATE	1.35	0.742
LIST	1.29	0.776
IND2	1.18	0.849
IND1	1.11	0.901
dLNEMPL	1.10	0.905
dGROWTH	1.10	0.906
dLEV	1.07	0.936
LNAGE	1.06	0.947
Mean VIF	1.28	

Source: Author's data analysis

Next, the author represents regression results about the impact of equitization on firm performance changes.

4.2.4.2 Regression results

Table 4.14. Regression results in the impact of equitization on firm performance changes

Variables	dROA		dTAS	
	Coef.	P>|t|	Coef.	P>|t|
dSTATE	-0.001***	0.001	0.007	0.122
TAXAD	-0.019	0.113	0.259	0.165
dLNEMPL	-0.0002	0.989	0.256***	0.002
dLEV	-0.027	0.203	0.171	0.691
LNAGE	-0.009	0.389	0.057	0.655
dGROWTH	-0.0003	0.141	0.003	0.111
IND1	0.020	0.291	0.701	0.120
IND2	0.010	0.342	0.399**	0.020
LIST	0.026*	0.055	-0.163	0.258
PHASE	-0.024	0.121	0.169	0.903
_cons	-0.019	0.629	-0.080	0.828
F-statistic/ Prob > F	2.27**	0.014	1.95**	0.038
R-squared		0.1090		0.078
With Robust Standard Errors		*yes*		*yes*

Note: ***, **, and * denote significance levels of 1%, 5%, and 10% respectively.
The number of observations is 295

Source: Author's data analysis

The impact of tax incentive policy on firm performance

After applying the regression model with the dependent variable of dROA, the results are presented in Table 4.14.

The regression results from Table 4.14 show that equitization impacts profitability improvement (dROA) through the change in state ownership after equitization in Vietnam. However, the tax incentive policy generally does not affect ROA improvement. For ROA, improvement in this measure is not only dependent on the profit after tax but assets also influence ROA improvement.

Results from Table 4.14 show that tax incentive policy does not impact the change in operating efficiency when considering the change in total asset turnover (dTAS). This result is similar to previous results when the author applies the pre-post comparison method and the with-without comparison method above. After equitization, privatized SOEs tend to reduce state ownership, which is likely to increase operating efficiency if considering asset turnover. However, equitized SOEs in Vietnam do not reduce state ownership rate much after equitization and it is difficult for these firms to improve operating efficiency. Tax incentive policy does not affect asset turnover change, and this is very reasonable since asset turnover is calculated based on revenue divided by assets, so tax policy does not affect asset turnover change.

Firm performance differences between listed and unlisted firms

As reported by the Vietnam Ministry of Finance (2020), 755 equitized SOEs were not listed/registered for trading on the stock market up to August 31, 2019. The reason for the listing delay is that several enterprises operate inefficiently. There are businesses in the process of dealing with consequences of violations detected in the inspection and examination of Government agencies, failing to organize the General Meeting of Shareholders to ask for opinions on a plan to list their stocks after equitization. Some enterprises have problems determining the value of state capital when they officially transform to joint-stock companies and have not yet made equitization finalization according to audit regulations. According to Decision 51/2014 / QD-TTg of the Prime Minister on some contents of divestment, enterprises have 90 days to complete procedures for public company registration, stock

registration for concentrating depository at the Securities Depository Center, and trading registration on UPCoM.

Listing status has a positive impact on ROA improvement after equitization in Vietnam. This result shows that listed firms have greater ROA improvement than un-listed firms after equitization. The listing may require certain procedures but managers from equitized SOEs should actively have strategic plans for their firms to get listed after equitization.

The number of employees, leverage, operating years, growth rate, industry and equitization phases have no impact on equitized enterprises' profitability improvement (dROA). Thus, managers from both equitized and non-equitized SOEs can apply this result to predict ROA change after equitization in Vietnam. Furthermore, change in ROA is directly affected by the change in ownership structure, operation restructuring and corporate governance.

According to the results of t-statistics, the change in state ownership of equitized enterprises impacts the profitability improvement (dROA) of participating enterprises. The results are consistent with a game-theoretical model of privatization in transition economies proposed by Huang and Xiao (2012) when these authors consider that profitability is negatively affected by state ownership. Table 4.16 shows that the change in state ownership after equitization has no impact on operating efficiency changes (dTAS) of equitized SOEs in Vietnam. Meanwhile, Huang and Xiao (2012) conclude that operating efficiency is negatively affected by Government ownership.

Besides, a change in the number of employees after equitization also positively impacts asset turnover change. After equitization, equitized SOEs tend to reduce labor to reorganize operations and perform well to maximize profits by cutting labor costs and optimizing production. The research results also show that change in leverage, the number of operating years, growth, listing status and equitization phase do not impact operating efficiency. For three industry groups, firms in the manufacturing and construction group tend to improve operating efficiency (dTAS by 0.399 units). Most of the equitized SOEs

belong to this group with a highly competitive business environment, so these SOEs have pressure to improve operating efficiency after equitization.

4.2.5 The underpricing phenomenon in the short run and long run

The author applies t-Test for the mean different from 0 when testing underpricing in the short-run (AR_i, $MAAR_i$) and the long run (AR_t, $CAR_{0,t}$).

Figure 4.3 shows the density distribution histogram of AR_i (%) and $MAAR_i$ (%). Results show quite different results, specifically the $MAAR_i$ (%) density curve has a higher peak than that of AR_i (%). In addition, AR_i (%) and $MAAR_i$ (%) tend to be skewed to the right, meaning underpricing is likely to occur.

The results in Table 4.15 show that there is no evidence of underpricing when considering the AR_i (%) value. Thus, the research results are somehow contrary to previous studies by Ly and Kha (2013), Tran *et al.* (2014), Benveniste *et al.* (2008) and related theories.

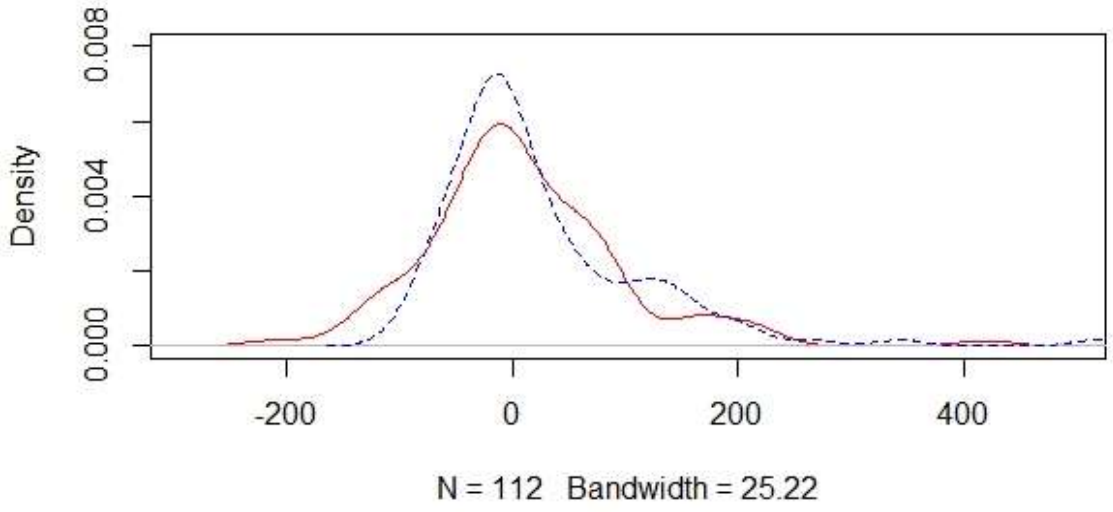

Figure 4.3. The density of the short-run underpricing

Source: Author's analysis

Relevant theories have explained why enterprises use underpricing to make the process of issuing IPO shares more favorable so that investors have the opportunity to earn returns on the first trading day. The low valuation of enterprises also makes the IPO process easier to succeed. Beatty Beatty and Ritter (1986) argue that investors are unsure about the values of IPO shares, so issuers also tend to underprice to attract

investment. Benveniste *et al.* (2008) state that initial issuers also underprice IPO, so investors are likely to gain returns on the first day once the enterprise is listed. The results of this study also coincide with the research by Benveniste Benveniste *et al.* (2008). IPOs are mostly large-scale enterprises from 2006 to 2015, so they are usually underpriced at the first issuance.

However, there is underpricing phenomenon of equitized SOEs in agriculture, forestry and fishery industry, and manufacturing and construction industry. IPO Firms before 2008 tend to be underpriced, but firms after 2008 tend to overprice. The financial crisis (2007-2008) affects the stock market in Vietnam, which leads to low stock prices after the financial crisis, resulting in overpricing phenomenon. If we consider the underpricing level calculated by $MAAR_i$ (%), the research results from Table 4.15 show that there is an underpricing phenomenon considering the market price. The results from Table 4.15 show that underpricing calculated by $MAAR_i$ (%) also reaches an average of 26.129 % and is statistically significant.

Table 4.15. Testing for underpricing in the short run

Classifications	Obs	AR_i (%)		$MAAR_i$ (%)	
		Mean	t-statistic	Mean	t-statistic
The whole samle	112	10.629	1.2717 (0.103)	26.129***	3.002 (0.002)
Industry group					
Argriculture, fishery and mining	7	27.205*	1.556 (0.085)	42.854	1.733 (0.134)
Manufacturing and construction	51	21.778*	1.611 (0.057)	42.017***	2.701 (0.005)
Service	54	-2.047	-0.179 (0.571)	8.955	0.925 (0.179)
Firm size					
Small and medium-sized SOEs	9	-40.142	-1.710 (0.937)	-7.39	-0.262 (0.600)
Large scale SOEs	103	15.066**	1.723 (0.044)	29.058***	3.187 (0.001)
Financial crisis					
Before 2008	51	42.182***	2.896 (0.003)	67.564***	4.158 (0.000)
After 2008	61	-15.749**	-1.968 (0.026)	-8.513*	-1.568 (0.061)

Note: *, ** and *** denote significant levels at 10%, 5% and 1%.

Source: Author's analysis

If classified by industry group, enterprises in manufacturing and construction industries are underpriced at 42.017 %, large-scale enterprises are also underpriced (29.058 %), and IPO firms before 2008 were underpriced (67.564 %). Thus, large-scale enterprises have the underpricing phenomenon if considered market adjustment price. The underpricing level based on market adjustment giving more accurate results (Aggarwal *et al.*, 1993).

Research results from underpricing testing are consistent with reality in Vietnam. According to the State audit office of Vietnam (2017), some SOEs were reporting low firm value compared with actual audited value. The difference value between the reported value and the audited value is considerable (Binh Son refining and petrochemical Company Limited with the difference of 5,359,897 mil VND, Petrovietnam power corporation with the difference of 1,994,458 mils VND, PetroVietnam Oil Corporation with the difference of 512,533 mils VND, etc). Low firm valuation leads to underpricing and the State capital loses when these firms participate in equitization programs. Determining the enterprise value faces many difficulties, so there are many cases where the enterprise value through auditing differs significantly from the reported value of the enterprise.

Determining the value of SOEs in the equitization is an essential but complicated task that determines the success of SOE transformation into joint-stock companies. Recently, the completion of mechanisms and equitization policies in asset valuation, in particular, has been entirely issued through the application process with appropriate adjustments to the actual situation. In particular, the introduction of Decree 59/2011/ND-CP and its amendments, supplements, and guidelines are some of the essential factors which help the equitization progress from 2011- 2015 be faster, minimizing the possibility of the state capital and asset losses in the equitization process. However, obstacles and difficulties in the process of implementing the valuation of SOEs have been further removed in Decree 126/2017/ND-CP, creating a premise for the completion of the plan. However, the valuation of SOEs in practice has certain shortcomings in the financial issues of equitized SOEs.

Table 4.16. Testing for overpricing in the long run

Month of seasoning	Obs	ARt		CAR0,t	
		Mean	t-statistic	Mean	t-statistic
1	48	-0.033	-0.343	-0.033	-0.343
2	48	-0.058	-0.606	-0.092	-0.476
3	48	-0.057	-0.569	-0.148	-0.510
4	48	-0.057	-0.558	-0.206	-0.524
5	48	0.114	1.089	-0.092	-0.191
6	48	-0.080	-0.771	-0.172	-0.295
7	48	-0.097	-0.937	-0.269	-0.393
8	48	-0.111	-1.066	-0.380	-0.483
9	48	-0.120	-1.129	-0.500	-0.561
10	48	-0.128	-1.189	-0.628	-0.629
11	48	-0.135	-1.245	-0.763	-0.690
12	48	-0.147	-1.364*	-0.911	-0.751
13	48	-0.163	-1.504*	-1.074	-0.814
14	48	-5.656	-3.195***	-6.730	-2.582***
15	48	-5.305	-3.201***	-12.035	-2.901***
16	48	-4.999	-3.207***	-17.034	-3.009***
17	48	-4.728	3.213***	-21.763	-3.062***
18	48	-4.487	-3.220***	-26.250	-3.094***
19	48	-4.272	-3.228***	-30.522	-3.115***
20	48	-4.078	-3.237***	-34.601	-3.131***
21	48	-3.905	-3.246***	-38.506	-3.144***
22	48	-3.747	-3.256***	-42.254	-3.154**
23	48	-3.604	-3.265***	-45.858	-3.163***
24	48	-3.474	-3.276***	-49.332	-3.171***
25	42	-2.372	-2.191**	-37.054	-2.104**
26	42	-2.300	-2.202**	-39.354	-2.109**
27	42	-2.232	-2.212**	-41.586	-2.115**
28	42	-2.169	-2.223**	-43.756	-2.120**
29	42	-2.111	-2.234**	-45.867	-2.125**
30	42	-2.058	-2.246**	-47.926	-2.130**
31	42	-2.011	-2.260**	-49.938	-2.135**
32	42	-1.967	-2.275**	-51.905	-2.140**
33	42	-1.926	-2.289**	-53.831	-2.145**
34	42	-1.888	-2.306**	-55.720	-2.150**
35	42	-1.853	-2.322**	-57.574	-2.155**
36	42	-1.820	-2.338**	-59.394	-2.160**

Note: *, ** and *** denote significant levels at 10%, 5% and 1%.

Source: Author's analysis

Table 4.16 shows that underpricing no longer exists in the long run and is statistically significant from the twelfth month for AR_t and from the fourteenth month for $CAR_{0,t}$. This result shows that the market adjusts the stock price below IPO offer

price in the long run. Underpricing IPOs helps to attract IPO investors because of short-term returns.

4.3 Hypothesis testing

4.3.1 Hypothesis on the impact of equitization on firm performance of equitized SOEs compared with non-equitized state-owned enterprises (hypothesis 1)

Research results show that equitization helps equitized enterprises improve profitability (dROA) but does not help firms improve operating efficiency (dTAS) than non-equitized enterprises in the same period. Therefore, the author rejects hypothesis H1 explaining that equitized SOEs improve firm performance compared with non-equitized SOEs.

This result is in contrast to previous studies by Loc and Tran (2016), Nhan and Son (2017), Claessens and Djankov (2002). According to Arocena and Oliveros (2012), there is a significant improvement in privatized SOEs' operating efficiency after privatization, while there is no improvement in this aspect of private firms. Previous studies by Boubakri *et al.* (2004), D'Souza *et al.* (2005), Sakr (2014) often adopt the pre-post comparison method to measure changes in performance measures of privatized enterprises, without considering non-privatized enterprises in the same period.

The efficient market theory and the new public management theory indicate that there is no need for state intervention in privatized SOEs to improve firm performance and security prices. Thus, equitized SOEs can not improve firm performance compared with non-equitized SOEs in the same period because equitization does not fully transfer state assets to the private sector in general. Besides, the State still controls or holds dominant shares in privatized enterprises after privatization with slow the divestment progress in transition countries, so it is tough for privatized SOEs to improve operating efficiency in transition economies. Table 4.11 indicates that the Vietnamese state still has high state ownership in most of the equitized SOEs in Vietnam.

However, the research results have similarities with the results of studies by Jiang *et al.* (2009), Wei *et al.* (2003) in China. State representatives still control

equitized SOEs in the early post-privatization period in Vietnam. The equitized enterprises in the period 2006-2015 are mainly large-scale ones with slow change of operating objectives, monitoring mechanism, and weak competitiveness after privatization. The public-choice theory and the new public management theory only explain that privatized SOEs improve firm performance if private ownership plays an essential role in maximizing profits. Similarly, Jiang *et al.* (2009) conclude that privatization does not help state-owned enterprises operate more effectively, especially when compared with non-privatized firms in the same period. Liao *et al.* (2014) examine the roles of privatization with a data set of 1,032 firms in China and find that privatization does not improve operating efficiency and corporate governance of privatized SOEs than private firms.

4.3.2 Hypothesis on the impact of equitization on firm performance of equitized SOEs compared with non-equitized state-owned enterprises by average state ownership rates after equitization (hypothesis 2)

Research results show that the State should not control equitized SOEs after equitization in Vietnam because equitization only helps equitized SOEs improve profitability compared with non-participating firms (dROA) when firms are no longer under state control after equitization (average rate of state ownership after four years of equitization is less than 50%). Firms with more than 50% of state ownership do not improve profitability and operating efficiency over non-equitized firms in the same period. The research results are consistent with related privatization theories, such as the new public management theory, efficient market theory and the basic theorem of welfare economics theory. According to the new public management theory, privatized firms can improve firm performance when the State does not maintain state ownership in these privatized firms after privatization. According to the basic theorem of welfare economics theory, privatization is necessary to allocate suitable resources for the public sector and private sector. However, state intervention is necessary when the State still remains some SOEs in key sectors to regulate the economy if there is no Pareto efficiency in resource allocation.

Table 4.11 shows that enterprises in Vietnam still maintain high state ownership after equitization, the likelihood of state representatives to control enterprises after equitization is very high, so it is difficult to improve operating efficiency. The new public management theory explains that privatized SOEs may increase operating efficiency when ownership restructuring takes place. However, equitized SOEs do not change much about the state ownership after equitization in Vietnam, so equitization does not help Vietnamese equitized SOEs improve operating efficiency after equitization. Thus, the results of this study are different from those of developed countries by Boubakri *et al.* (2004), D'Souza *et al.* (2005), Huang and Xiao (2012) because privatized enterprises in these countries no longer have a high percentage of state ownership, and private ownership plays a vital role within privatized SOEs. According to Harper (2002), privatization helps SOEs to be more effective in profitability, productivity, and ability to utilize capital in the Czech Republic in general. Arocena and Oliveros (2012) find a significant improvement in privatized SOEs' efficiency after privatization while there is no improvement in this aspect of private firms in Spain. Bachiller (2012) finds that only firm performance in the utility industry is significantly better after privatization in European companies. Boubakri *et al.*, (2008) argue that privatized enterprises have an increase in profitability, net sales, investment capital, productivity, labor productivity, dividend payout, and a decrease in debt level in developing countries.

Fan *et al.* (2014) conclude that a Government's reluctance to relinquish could have significant negative consequences on corporate governance and firm performance. Tu *et al.* (2013) explain that there is a political connection after privatization in China. The political connection can interfere in firm innovation after privatization in China. Gan (2009) explains that privatization in China does not help reduce the State's dominant role in privatized firms, as most privatized enterprises remain state-owned or have a political relationship with post-privatized enterprises. This research result is also in contrast to previous studies in Vietnam by Loc *et al.* (2006), Loc and Tran (2016), Hung *et al.* (2017) when these authors conclude equitization helps equitized SOEs improve the operating efficiency of equitized

enterprises. Vo *et al.* (2013) explain that only organizational integration significantly affects the performance of privatized firms. Privatized firms with less state ownership perform better than those with more state ownership in Vietnam.

The research results are consistent with previous studies by Loc and Tran (2016), Liao (2014). Equitized SOEs with a high rate of state ownership do not significantly improve firm performance compared with non-equitized firms in the same period in Vietnam (Loc and Tran, 2016). The public choice theory and the new public management theory explain privatization or equitization can help equitized SOEs improve firm performance by restructuring ownership structure and operations. Jiang *et al.* (2009), Wei *et al.* (2003) prove that privatized firms without state control or interference can operate better than privatized firms with state control or interference in China. Base on research findings and empirical evidence, the author accepts hypothesis H2 indicating that when considering non-equitized SOEs in the same period, equitization impacts firm performance dissimilarly according to average state ownership rates after equitization.

The government has issued Decision 22/2021/QD-TTg for the list of SOEs that the Government continues to control based on industries and average state ownership. Research results show that this Decision is not appropriate because equitized SOEs with state control can not improve profitability after equitization compared with non-equitized SOEs. The Chinese government only maintains state control resources of SOEs in key industries (Appendix 6). Also, considering 295 equitized enterprises in the period of 2006-2015, the state ownership rate is decreased from 47.812% to 34.637% after four equitization years. The divestment progress is extremely slow in the equitization program in Vietnam.

4.3.3 Hypothesis on the impact of equitization on firm performance of equitized state-owned enterprises compared with non-equitized SOEs according to industry groups (hypothesis 3)

Research result shows that equitized SOEs in the second sector (the manufacturing and construction sectors) have improved their profitability (dROA increased by 2.50% on average) after equitization compared with non-participating

firms. However, equitized SOEs in the first group (agriculture, forestry and fishery) and enterprises in the third group (service sector) do not significantly improve their firm performance when we consider the impact of equitization on firm performance compared with non-equitized SOEs in the same period. Thus, the author accepts the third hypothesis indicating that equitization impacts firm performance dissimilarly according to industry groups when considering non-equitized SOEs in the same period.

This research result is consistent with the theory of competitive advantage. According to the theory, firms operating in different competitive industries have different competitive advantages, leading to affect firm performance. Firms in different industries will have different gains in real sales after privatization (Megginson *et al.*, 1994). According to Rakhman (2018), Indonesian privatized SOEs have different firm performance improvements according to industry groups. Firms in highly competitive industries (not essential industries) will have significant performance improvement and tend to operate more efficiently (Sheshinski and López-Calva, 2003). Research result from the dissertation shows that firms in manufacturing group with highly competitive environment significantly improve firm performance after equitization. Firms in the agriculture, forestry and fishery group slowly change and update new technology in Vietnam, so it is difficult to improve firm performance after equitization. Service firms are usually small-scale ones and they can not compete with other private firms in the same sector after equitization in Vietnam.

Research results are consistent with reality based on statistics results of GSO and firms in the manufacturing and construction industry group have the highest ROA if considered from 2011 to 2019. However, firms in agriculture, forestry and fishery and service have not upgraded new technology and their products can not compete with similar products from foreign competitors. Vinamilk is a good performance company in the food and beverage industry after equitization with investment and experiences from strategic foreign partners.

The Government has reduced the number of industries to control over SOEs from 27 (Decision 14/2014/QD-TTg) to 13 (Decision 58/2014/QD-TTg). However, Decision 22/2021/QD-TTg has increased the number of industries to control to 14. Thus, there is no signal that the State would like to reduce state control over equitized SOEs after equitization.

4.3.4 Hypothesis on the impact of tax incentives on firm performance and firm performance differences between listed and unlisted firms after equitization (hypothesis 4)

The research results also show that tax incentive policy has no impact on profitability improvement (dROA) and operating efficiency change (dTAS). This result is in contract with research work by Aslund (2013) when this author explains that privatization incentive policies have a positive impact on the performance of privatized firms. Thus, tax incentive policies have no impact on equitized SOEs' firm performance but create an unfair competition environment among businesses. Radygin (2014) argues that countries use some incentive policies to speed up the privatization process, which leads to stagnation in financial market development because enterprises rely too much on incentive policies and are slow to change after privatization. According to the welfare theory to regulate the economy when necessary, the State can apply tax incentives or tax cuts to improve firm performance and increase firm output. However, the Vietnamese government applied tax incentives in a short period, so the tax incentives does not help equitized SOEs improve firm performance in general. Besides, equitization is gradual in Vietnam and the State still maintains high state ownership in most equitized SOEs, leading to difficulties in firm improvements.

Other countries only applied subsidies or tax incentives for firms investing in encouraging sectors but the Vietnamese government has applied tax incentives for only equitized SOEs. Tax incentives have created an unfair competition environment with other firms. However, the Government has issued the Decree 150/2020/ND-CP indicating that equitized SOEs have similar incentive policies with newly-established firms, including tax incentives and other fee incentives. Tax incentives have been

continuously applied for upcoming equitized SOEs and this policy is not appropriate. Thus, the author will propose some recommendations for this Decree in chapter 5.

Listing status has a positive impact on ROA improvement after equitization in Vietnam. This result shows that listed firms have greater ROA improvement than unlisted firms after equitization. However, tax incentives do not impact on firm performance of equitized SOEs. Thus, the author rejects hypothesis H4 explaining that tax incentive policy has a direct impact on firm performance changes of equitized SOEs in Vietnam and there are differences in firm performance changes between listed and unlisted firms after equitization.

4.3.5 Underpricing hypothesis of equitized state-owned enterprises through the initial public offering (Hypothesis 5)

The author applies the t-Test for IPO underpricing and overpricing phenomenon when firms participate in the equitization program. There is no evidence of underpricing when considering the AR_i (%) value for the whole sample. However, there is underpricing phenomenon of equitized SOEs in agriculture, forestry and fishery industry, and manufacturing and construction industry. IPOs were mostly large-scale enterprises from 2006 to 2015, so they were usually underpriced at the first issuance.

Also, when we consider the underpricing level calculated by MAARi (%), the research results show that there is an underpricing phenomenon when considering market price adjustment. Firms offered before 2008 tended to be underpriced, but firms after 2008 tended to overprice. This result is consistent with previous studies by Tran *et al.* (2014), Ly and Kha (2013), Benveniste *et al.* (2008) and relevant theories. The market feedback theory indicates that underwriters and managers of privatized firms often underprice IPOs to attract investors participating in IPO deals. The signaling theory explains that firms wishing to issue successful IPOs often signal investors through underpricing their IPOs. These research results are consistent with reality based on the report by the State audit office of Vietnam (2017). There were many low state assets valuation cases compared with actual audited value (Binh Son refining and petrochemical Company Limited with the difference of 5,359,897 mil VND, Petrovietnam

power corporation with the difference of 1,994,458 mils VND, PetroVietnam Oil Corporation with the difference of 512,533 mils VND, etc).

Research results from this dissertation show that underpricing no longer exists in the long run and is statistically significant from the twelfth month for AR_t and from the fourteenth month for $CAR_{0,t}$. Amor and Kooli (2016), Jog *et al.* (2019) conclude that there is an overpricing phenomenon of IPOs in the long run. The divergence of opinion theory explains that there is a long-term decline in the price of IPOs, so there is no underpricing phenomenon in the long run. Thus, the final hypothesis should be accepted indicating that there is underpricing phenomenon of IPOs in the short run but overpricing phenomenon in the long run when firms participate in the equitization program.

4.4 Robustness test

Previous studies by Loc and Tran (2016), Tran *et al.* (2015), Hung *et al.* (2017) have only used the caliper or radius matching (0.01), and these previous studies have not checked the robustness of the average treatment effect. Thus, the author applies direct nearest-neighbor matching first, after that the author uses the neighboring matching method (N=5) to check the consistency.

Using the average treatment effect through propensity score matching (PSM) and regression approach also helps check the research results' validity.

4.5 Summary of chapter 4

Research results show that there is underpricing phenomenon in the short run but overpricing in the long run of IPOs when firms participate in equitization programs. Research results from average treatment effect (ATE) have shown that equitization only helps enterprises improve profitability (dROA) but does not help firms improve operating efficiency (dTAS) than non-equitized enterprises in the same period. Tax incentives have no impact on dROA and dTAS but the change in state ownership impacts on dROA. The quantitative results in this chapter provide evidence for recommendations in Chapter 5.

Chapter 5. CONCLUSIONS AND RECOMMENDATIONS

Based on quantitative research results from Chapter 4, this Chapter represents conclusions and some recommendations for the Vietnamese Government, investors, equitized SOEs, and non-equitized SOEs.

5.1 Conclusions

Based on quantitative research results in chapter 4 and research gaps, there are some conclusions as follows:

First, the two matching techniques (direct neighbor matching and nearest-neighbor matching) provide a similar conclusion that the equitized SOEs only improve their profitability (dROA) but do not improve operating efficiency (dTAS) after equitization. This finding is in contrast to other studies in the developed and developing countries by Megginson *et al.* (1994), Claessens and Djankov (2002) but quite similar to the results of empirical studies in China (Jiang *et al.*, 2009; Wei *et al.*, 2003) and in Vietnam (Pham, 2017).

There is no operating efficiency improvement because the equitized enterprises in 2012-2015 are mainly large-scale ones with slow change of operating objectives, monitoring mechanism, and weak competitiveness after equitization. Also, equitized SOEs could not solve problems in the pre-equitization period, so they still suffer these problems even in the post-equitization period. According to Jiang *et al.* (2009), equitized SOEs' pre-equitization difficulties should include financial debt, irrecoverable debt and redundant workers. After equitization, it is more difficult for joint-stock enterprises to access capital than state-owned enterprises because there are no more incentives compared to the pre-equitization period, the State no longer has incentive policies for joint-stock enterprises. Therefore, the study results contribute to the practical aspects compared with previous empirical studies in Vietnam.

Second, Research results show that equitization only helps firms improve profitability compared with non-participating firms (dROA) when firms are no longer under state control after equitization (average rate of state ownership after four years

of equitization is less than 50%). Research results show that firms with state ownership less than 20% improve ROA (3.95% on average) after equitization and firms with state ownership from 20% up to 30% also improve ROA (2.75% on average). Besides, firms with state ownership from 30% up to 50% improve ROA (2.35% on average). However, there is no evidence that firms with average state ownership from 50% up to 65% can improve firm performance (both ROA and TAS). Also, firms with average state ownership over 65% significantly have lower firm performance (ROA) compared with non-equitized SOEs in the same period.

According to the new public management theory, privatization is the process to transfer rights to provide public services from SOEs to public firms. The theory supports the concept that the State should not control or interfere with firms after privatization to improve firm performance. According to the mixed-market economy, the State should only regulate the economy through fiscal policies and there is no need to control privatized SOEs after privatization. The State only keeps public SOEs in some key sectors to regulate the economy, such as energy, telecommunication, etc. The efficient market theory also explains that there should not be State interference in firm operations since the market can form its structure and security prices reflect all information related to the firms. In Vietnam, the State still interferes with equitized SOEs and state representatives make strategic decisions within the firms, leading to little firm performance improvements after equitization and this is also one characteristic of the equitization program in Vietnam which is similar to privatization policy in China.

Third, there are different firm performance improvements of equitized SOEs after equitization in Vietnam. Only firms in the manufacturing industry have significant firm performance improvement after equitization, while firms in the agriculture, forestry and fishery and service do not significantly improve firm performance after equitization. Thus, the Government should choose firms in the manufacturing industry for equitization first and firms in other sectors should carefully prepare strategic operation plans after equitization to get equitization participation approvals from the equitization steering committee.

Fourth, research results show that tax incentive policy generally does not affect ROA improvement. For ROA, improvement in this measure is not only dependent on the profit after tax but assets also influence ROA improvement. The Vietnamese government applied tax incentives only for equitized SOEs to ensure stable operation and firm performance improvement of these firms. However, firms can not improve firm performance if managers from these firms do not use benefits from tax incentives for technology innovation and investment activities (Klemm, 2010). Other factors can affect firm performance, such as adequate strategies, resources, technologies, competition, etc. According to the mixed-economy theory, the State should only regulate the economy through fiscal policies and these policies should be applied for all firms to make sure fair competition in the market. However, the Vietnamese government applied tax incentives only for equitized SOEs, leading to an unfair competitive business environment. The Government stopped applying tax incentives policies but the policy did not have any positive effect on profitability improvement of equitized SOEs in Vietnam.

Listing status has a positive impact on ROA improvement after equitization in Vietnam. This result shows that listed firms have greater ROA improvement than un-listed firms after equitization. The results show that unlisted firms should actively participate in listing for firm performance improvements. When firms are listed, they meet transparency requirements and investors can easily make investment decisions. In this case, firms can easily issue shares and increase capital. According to the efficient market theory, the Vietnamese stock market has not achieved any form of efficient market because there are not many listed firms after equitization in Vietnam. There is little information about firms after equitization and the security prices can not reflect available or historical information related to firms.

Finally, there is evidence to conclude an underpricing phenomenon of IPOs in the short run and an overpricing phenomenon in the long run. Equitized SOEs set low offer prices for IPOs to attract IPO investment in the short run (The market feedback theory and the signaling theory). However, the divergence of opinion theory explains that information about corporate performance and market

information becomes fully transparent after listing, the divergence of opinions of subjective and pessimistic investors will be narrowed, leading to a long-term decline in the price of IPOs. The efficient market theory and market feedback theory explain that security prices reflect all available information related to firms.

5.2 Recommendations

Based on the research results and research gaps, the author proposes some recommendations as follows:

5.2.1 Equitization and firm performance of equitized state-owned enterprises compared with non-equitized state-owned enterprises

Research results show that equitization only helps enterprises improve profitability if considering ROA compared with non-equitized enterprises. The Vietnamese government applied tax incentives for equitized SOEs in a certain period, leading to improve ROA because income after-tax could increase with corporate tax cuts. As indicated in Table 5.1, large-scale SOEs could improve ROA compared with non-equitized SOEs in the same period (most of the equitized SOEs are large-scale ones). However, equitized SOEs do not improve operating efficiency after equitization (dTAS) compared with non-equitized enterprises because equitized SOEs could not improve sales after equitization.

Table 5.1 Return on assets improvement of equitized state-owned enterprises compared with non-equitized state-owned enterprises based on firm size

Category	Improved (on average)	Not improved
Small and medium-sized SOEs		x
Large-scale SOEs	0.022	

Source: Author's data analysis

Based on the above empirical results, the author proposes some recommendations as follows:

For small and medium-sized SOEs

Small and medium-sized SOEs should have clear operational and strategic plans after equitization because equitization does not always help them operate more

efficiently (compared with non-equitized SOEs). The Board of Directors or leaders of equitized enterprises needs to develop an efficient divestment process in the equitization plan to submit to the Government. The slow divestment progress has brought many adverse effects on the improvement of firm performance after equitization.

For large-scale SOEs

Large-scale equitized SOEs should actively participate in equitization programs to improve profitability. Some managers from equitized SOEs should not focus on their firm performance changes only without considering non-equitized SOEs in the same periods and this leads to inadequate conclusions or strategies.

The government needs to have criteria for selecting equitized enterprises, in which priority is given to large-scale enterprises in equitization because equitization helps these enterprises improve profitability. At present, Decision 22/2021/QD-TTg only classifies the group of enterprises with the percentage of state retained by the state but has not paid attention to the firm size. In the coming time, the Government needs to consider adding classification criteria on firm size besides the industry factor into criteria for selecting priority enterprises for equitization, in which priority should be given to large-scale enterprises participating in equitization.

The average treatment effect shows that firms with more than 50% of state ownership do not improve profitability and operating efficiency over non-equitized firms in the same period. The results of the study explain why investors have not been interested in investing in IPOs recently because it is clear that equitized enterprises after equitization are unlikely to operate more efficiently than non-equitized enterprises in the same period in terms of profitability (dROA) and operating efficiency (dTAS). These research results are also contrary to those in developed and developing countries when they conclude that privatization helps increase firm profitability and operating efficiency (Boubakri *et al.*, 2004).

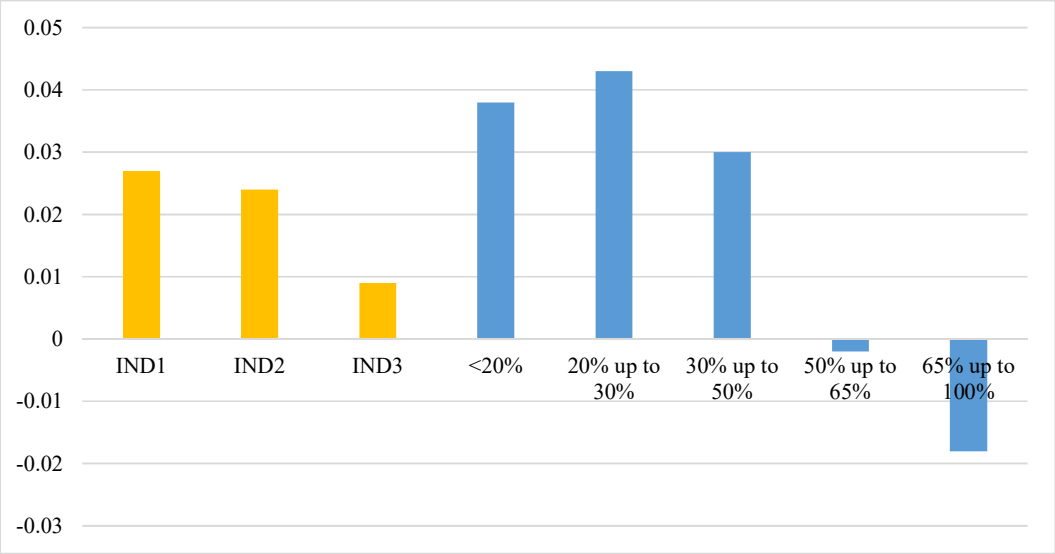

Figure 5.1. Return on assets change of large-scale equitized state-owned enterprises according to average state ownership and industry groups

Source: Author's data analysis

Figure 5.1 also shows that large-sized enterprises have improved ROA compared with non-equitized enterprises in the same period because firms in three industry groups with no state control have improved ROA after equitization. Therefore, the Government should prioritize the equitization of large-scale enterprises and accelerate the divestment speed so that large-scale equitized enterprises can improve their profitability compared with non-equitized enterprises in the same period.

In addition, equitized enterprises need to have policies/strategies to improve sales after equitization, optimize resources to generate revenue based on used assets to maximize assets efficiency and liquidate unnecessary assets to ensure improved operating efficiency (TAS) after equitization.

Now, Vietnam has joined WTO and other world trade associations and it is necessary to promote private sector development rather than control equitized SOEs after equitization. According to the Law on enterprises (2020), state-owned enterprises include enterprises in which the State holds more than 50% of the charter capital and the total number of shares with voting rights. Thus, the government should

continue to equitize SOEs to develop the private sector. The Law on enterprises (2020) has changed the concepts of SOEs after equitization in Vietnam.

5.2.2 The state deregulation and control

Table 5.2 shows key findings of state deregulation through average state ownership and ROA improvement after equitization in Vietnam.

Table 5.2 Return on assets improvement of equitized state-owned enterprises compared with non-equitized state-owned enterprises based on average state ownership after equitization

Category	Improved (on average)	Not improved
<20%	0.0395	
20% up to 30%	0.0275	
30% up to 50%	0.0235	
50% up to 65%		x
65% up to 100%		x

Source: Author's data analysis

The Vietnamese government still controls and interferes with equitized SOEs even after equitization. The slow state divestment leads to slow state deregulation and no firm performance improvements after equitization in Vietnam. The Vietnamese government has applied quite similar privatization policies in China (Appendix 5). However, other developed countries have different privatization programs where there is complete state deregulation and transfer to the private sector. These countries only maintain some key public firms to regulate the economy in key sectors, such as telecommunication, energy, etc. According to the public choice and new public management theory, the State interferes and has low divestment because state representatives are afraid of losing benefits after privatization/equitization. Based on the research results, the dissertation proposes some recommendations as follows:

For equitized SOEs with average state ownership below 50% after equitization

According to the results from Table 5.2, only enterprises with an ownership ratio lower than 50% can improve their performance (profitability) after equitization, in which enterprises with an average ownership rate of less than 20% have the highest ROA improvement compared to non-equitized enterprises in the same period.

Therefore, investors should choose enterprises with a state ownership ratio lower than 50% to invest in IPOs. Investors also need to consider the progress of state divestment. The State still dominates firm operations in the four years after equitization, and this does not help equitized SOEs improve firm performance.

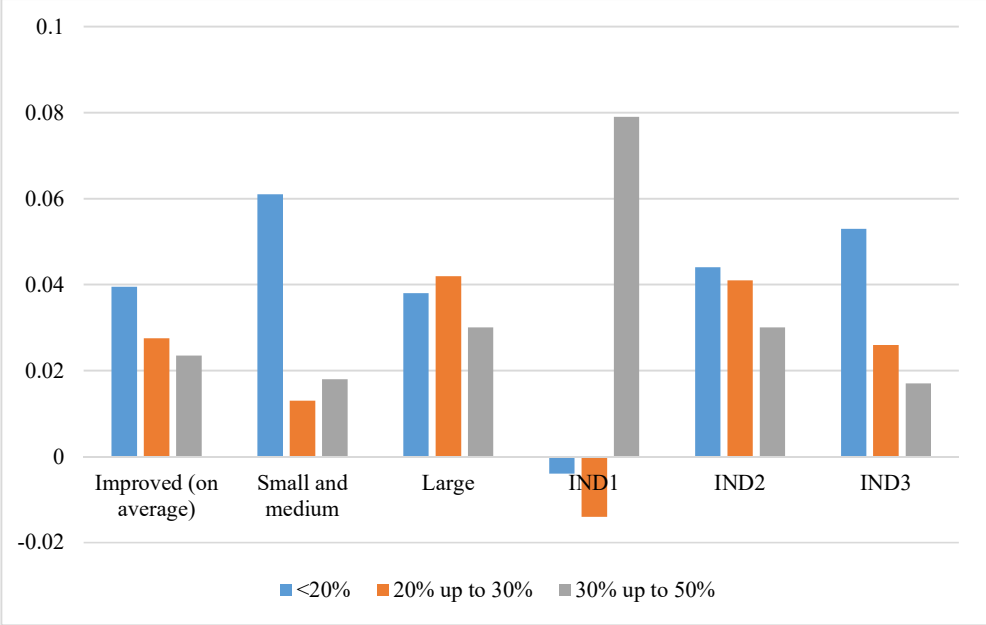

Figure 5.2. Return on assets change of equitized state-owned enterprises according to average state ownership, firm size and industry groups

Source: Author's data analysis

Figure 5.2 shows that equitized enterprises with average state ownership below 50% after equitization have improved ROA because equitized firms in both firm size groups and industry groups 2 and 3 have improved ROA. Thus, equitized SOEs can propose to the Government for quick divestment progress with a suitable control mechanism so that managers from equitized SOEs can make their decisions with high responsibilities for creativity and efficiency. The lower the state ownership ratio, the more likely these enterprises are to improve profitability.

The Vietnamese Government needs to speed up the divestment so that enterprises can reduce state ownership to operate more efficiently due to appropriate management mechanisms, clear operational goals, and operational restructuring. Public choice and new public management theories affirm that enterprises improve firm performance if

state representatives do not control these enterprises after privatization. Research results show that the state ownership rate is decreased from 47.812% to 34.637% (from the first year to the fourth year after equitization). Lessons learned from Russia and China show that the State only retains state ownership in essential sectors and privatizes the majority of state-owned enterprises to establish a market economy. Research results show that equitization only helps firms improve profitability compared with non-participating firms (dROA) when firms are no longer under state control after equitization (average rate of state ownership after four years of equitization is less than 50%). The Government has issued the Decree 150/2020/ND-CP to give instructions on three steps for transforming from public firms to equitized firms. The Government should have encouragement policies for public firms with fast and adequate assets valuation because most public firms do not actively value their assets (especially real estate) until they are required to participate in equitization. For step three of transforming, there are many procedures to revalue state assets with approvals from many organizations (ministries, ministerial-level agencies, government-attached agencies, provincial-level People's Committees, Hanoi National University, Ho Chi Minh City National University). Thus, the Government should reduce some unnecessary steps to encourage equitization participation.

Firms with state ownership less than 20% improve ROA (3.95% on average) after equitization and firms with state ownership from 20% up to 30% also improve ROA (2.75% on average). Also, firms with state ownership from 30% up to 50% improve ROA (2.35% on average). Decree 91/2015/ND-CP and Decree 32/2018/ND-CP do not include specific periods for divestment based on specific industries. The Government should issue instructions and decisions for divestment periods after equitization so that equitized SOEs managers can strictly follow and shorten equitization progress. The Government should only retain state ownership in key and necessary sectors and should hold below 50% of state ownership in a majority of equitized SOEs to encourage equitization participation and improve firm performance after equitization. The Vietnamese government should apply fast

divestment progress like privatization in developing countries, instead of gradualism for equitization.

For equitized SOEs with average state ownership above 50% after equitization

Investors should not invest in IPOs deals in case equitized SOEs still have state control after equitization to get initial returns. Enterprises with an ownership rate of more than 50% of state ownership after equitization need to propose to the equitization steering committee for quick divestment progress, or if there is a plan to divest, they need to speed up the divestment plan to improve profitability. Non-equitized SOEs should also carefully prepare plans to divest capital and propose the Government approve the equitization plan with a rapid divestment schedule to improve firm performance.

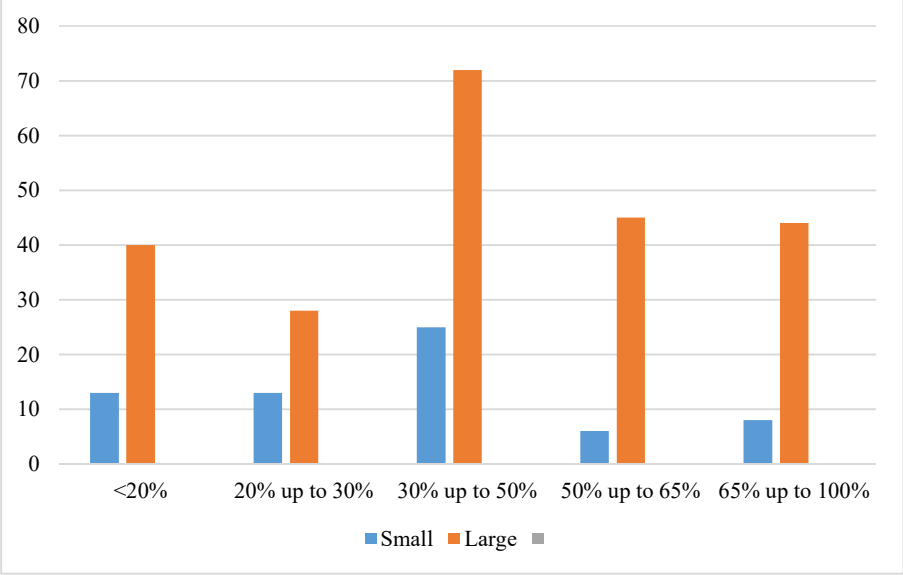

Figure 5.3. The number of equitized state-owned enterprises according to average state ownership and firm size

Source: Author's data analysis

The results of Figure 5.3 show that the State still controls more than 50% of the shares of enterprises after equitization, including small and medium-sized enterprises and large-scale enterprises. Decision 22/2021/QD-TTg stipulates that the State only holds dominant shares in SOEs without considering the firm size. Therefore, the

author recommends that upcoming regulations need to study the reduction of the number of state-dominated enterprises after equitization considering firm size, in which the State should not continue to control small and medium-sized enterprises and only hold a few large-scale enterprises because the results show that only large-scale enterprises can improve profitability after equitization. Holding small and medium-sized enterprises is also unnecessary to regulate the economy.

5.2.3 The impact of equitization on firm performance changes according to industry groups

There are different ROA improvements of equitized SOEs compared with non-equitized SOEs according to industry groups as indicated in Table 5.3

Table 5.3 Return on assets improvement of equitized state-owned enterprises compared with non-equitized state-owned enterprises based on industry groups

Category	Improved (on average)	Not improved
The agriculture, forestry and fishery sectors		x
The manufacturing and construction sectors	0.025	
The service sector		x

Source: Author's data analysis

Based on research results, the author proposes some recommendations as follows:

Figure 5.4 shows that the number of state-dominated enterprises after equitization is quite high and there are groups of firms according to different groups of state ownership retained after equitization. Therefore, the Government needs to review that it should only keep a few essential businesses to help regulate the economy because only enterprises that are no longer controlled by the state can improve profits compared with non-equitized enterprises after equitization.

The Government should consider Decision 22/2021/QD-TTg and other regulations in the future to reduce the number of industries that the State should control equitized SOEs because research results show that only equitized SOEs with no state control can improve profitability compared with non-equitized SOEs.

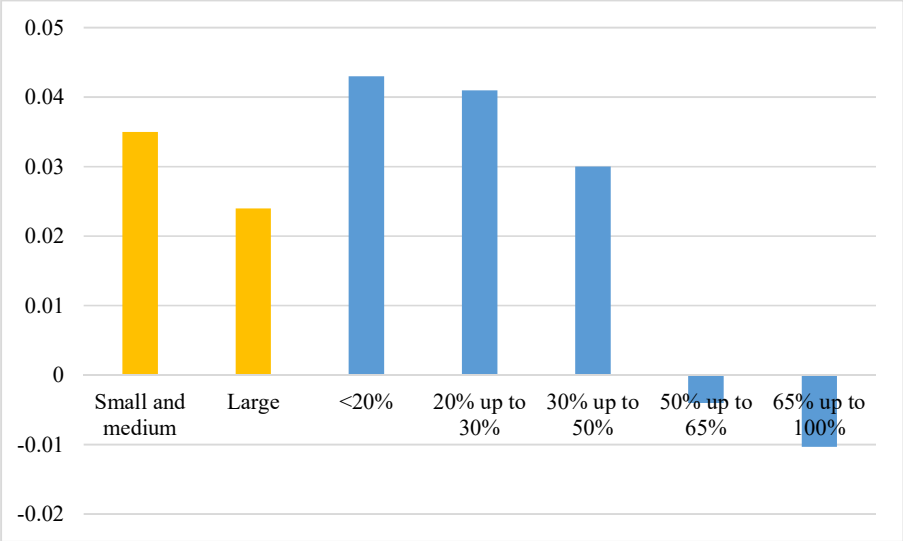

Figure 5.4. Return on assets change of equitized state-owned enterprises in the manufacturing and construction industry according to average state ownership and firm size

Source: Author's data analysis

Figure 5.4 shows that the ability to improve ROA of equitized SOEs in the manufacturing and construction industry is mainly due to enterprises with less than 50% state ownership. Therefore, the Government needs to accelerate the divestment process to further improve the profitability of manufacturing and construction enterprises after equitization compared with non-participating enterprises.

According to the Decision 22/2021/QD-TTg, the Government still hold a majority state ownership in many industries from 2021 to 2025 (100% state ownership for SOEs in 13 industries, over 65% state ownership for SOEs in 7 industries and from 50% up to 65% for SOEs in 7 industries). Thus, the Government should not continue to hold over 50% state ownership in equitized firms and this Decision should be revised to encourage equitization. The Government also considers issuing long-term instructions and decisions for equitization programs, instead of periodic guidelines. With Decision 22/2021/QD-TTg, the equitization progress and divestment progress can not be improved in the future and equitized SOEs can not improve firm performance.

For agriculture, forestry and fishery and service industry groups

Non-equitized SOEs in other industry groups (agriculture, forestry and fishery and service) should have clear strategic operation plans after equitization to improve firm performance after equitization. These firms, especially firms in agriculture, forestry and fishery should change technology to improve firm efficiency and performance because they will face competition with private firms in the same sectors after equitization while they do not receive much support after equitization from the State. Vinamilk is a leading brand in the food and beverage industry with high technology and skilled workers. Vinamilk is a successful model for firms after equitization in Vietnam to be ready to fairly compete with both domestic and foreign competitors in the world.

For manufacturing industry

Research result shows that only firm in manufacturing and construction significantly improve firm performance (dROA increased by 2.50% on average) after equitization compared with non-participating firms. Thus, investors should choose to invest in IPOs from equitized SOEs in the manufacturing firms for good firm performance after equitization and it is likely to get good initial returns. The government should choose most of the SOEs in this sector to participate in equitization. Other SOEs in the other two sectors should be limited chosen with the condition that managers from these SOEs need to prove suitable plans for improving firm performance after equitization in Vietnam. Decree 150/2020/ND-CP has not mentioned that SOEs in the manufacturing sector should be first chosen for equitization, this Decree mentions that all SOEs should be equitized except for SOEs in sectors that the Government should not equitize. Thus, the Government should issue instructions for choosing equitized SOEs in specific industries because only firms in the manufacturing and construction group tend to improve profitability.

Non-equitized SOEs in manufacturing firms should be confident in registering for equitization because equitization helps these firms improve firm performance compared with non-equitized SOEs in the same period. At present, non-equitized firms are passive to propose an equitization participation plan to the equitization

steering committee. Most of these firms do not accept changes and state representatives are afraid to lose control after equitization according to the new public management theory.

5.2.4 Incentive policies and listing encouragement

Research results show that tax incentives policy when equitization does not impact profitability change (dROA) and operating efficiency change (dTAS) after equitization in Vietnam. Recently, the Government no longer applies many incentive policies to equitized enterprises, so it is difficult for enterprises to improve their performance in the short term after equitization. Therefore, investors need to have a long-term investment strategy to properly evaluate the impact of equitization on equitized SOEs' firm performance, especially compared with non-participating firms in the same period. Besides, listed firms have greater ROA improvement than unlisted firms after equitization. Based on the above findings, the author proposes some recommendations as follows:

For equitized firms with and without tax incentives

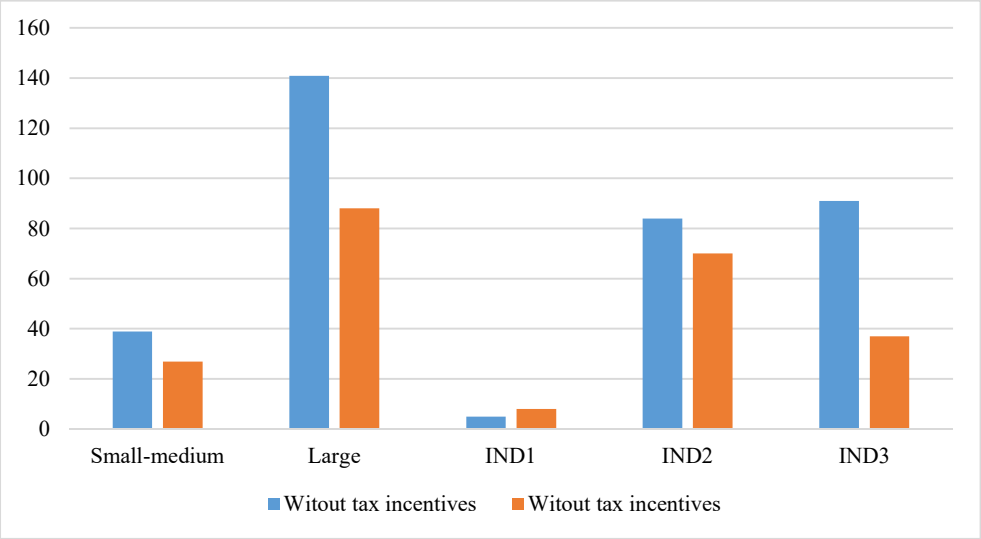

Figure 5.5. The number of equitized state-owned enterprises according to industry groups, firm size and tax incentives

Source: Author's data analysis

Figure 5.5 shows that the distribution of the number of enterprises by tax incentives and non-incentives is uneven. The application of tax incentives is only valid for one period, so this result is consistent with reality. In addition, the tax incentives do not help equitized SOEs improve firm performance compared with non-equitized SOEs, so the Government needs to review the regulations on corporate tax incentives for equitized enterprises in the coming time.

The Vietnamese Government should have appropriate policies to support equitized enterprises, especially in the first years of the post-equitization period. Research results show that equitized enterprises can not improve firm performance in the first four years compared with non-equitized SOEs (except for dROA) due to difficulties such as new entry into the competitive environment, ownership structure change, lacking competitive ability compared to private enterprises in the same industry. Equitization does not always help enterprises operate more efficiently, and the impact of equitization on firm performance changes depends on state ownership changes and tax incentives. The Government has issued the Decree 150/2020/ND-CP on transforming public firms to joint-stock firms. According to this Decree, equitized SOEs have similar incentive policies with newly-established firms, including tax incentives and other fee incentives. However, research results show that tax incentives do not help the equitized SOEs improve firm performance but create an unfair competition environment in Vietnam. The Vietnamese government should apply some other incentive policies like in China and Russia for equitized SOEs instead of tax incentives. Some incentive policies in Russia for privatized SOEs, including budgetary subsidies, trade protection, and financial credits. These policies changed dramatically in different privatization phases and privatization policies. The Russian Government has proposed a system of capital allocation through regional enterprise funds. These funds would be initially capitalized with Western aid money and raise both equity and debt in the public market. The Chinese Government has had tax incentive policies for businesses to attract foreign investment in technology, environment-friendly sectors, and tax incentives for businesses in certain localities.

The Government should apply other subsidies to equitized enterprises such as supporting loans, land leasing and encouraging investment in research and development, green technology sectors like China, UK and Russia. Besides, the Government does not need to continue using corporate income tax incentives because it directly affects the country's budget. Research results show that tax incentives do not help equitized SOEs improve operating efficiency and profitability when compared with non-equitized SOEs. The Government also needs to have a sufficient control mechanism in asset valuation because there have been some abuses and corruptions due to asset valuation or direct sales in equitization. According to the Decree 150/2020/ND-CP, equitized SOEs have similar incentive policies with newly-established firms, including tax incentives and other fee incentives. Thus, the Government should revise this Decree and applies some incentive policies like in China, UK and Russia to create a fair competitive environment, instead of supporting all equitized SOEs.

The government should gradually eliminate corporate income tax exemptions or tax incentives and instead provide cost-based tax incentives, such as accelerated depreciation, increased deductions when calculating income. These are tax incentives associated with actual investment items (for example, investment in research and development, training...) to encourage investment in technology innovation.

For listed firms

Figure 5.6 shows that the rate of non-listing for small and medium-sized enterprises is quite high. Therefore, the Government needs to review and have policies to promote small and medium enterprises to list on the market. Meanwhile, the Government also needs to have sanctions against enterprises in the manufacturing and service industries because most of these enterprises do not list on the stock market.

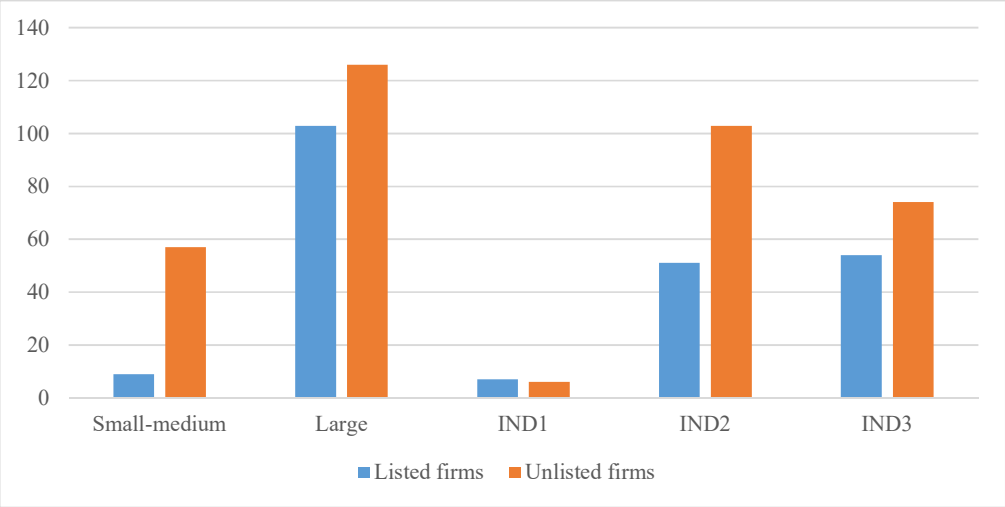

Figure 5.6. The number of equitized state-owned enterprises according to industry groups, firm size and listing status

Source: Author's data analysis

Research result shows that listed firms have greater ROA improvement than un-listed firms after equitization. Thus, post-equitization companies also need to quickly list on the stock market to contribute to the development of Vietnam's stock market.

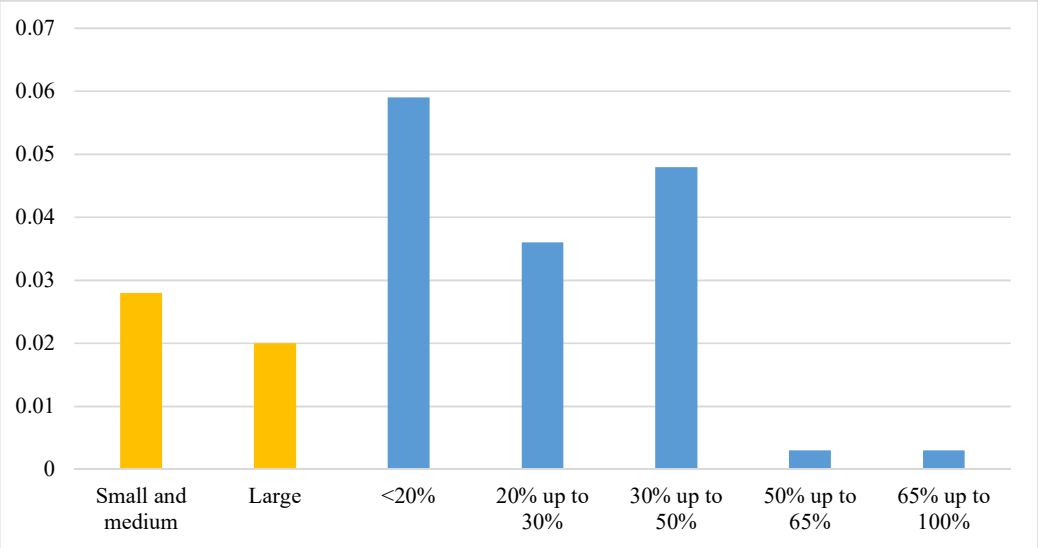

Figure 5.7. Return on assets change of listed equitized state-owned enterprises according to average state ownership and firm size

Source: Author's data analysis

Figure 5.7 shows that listed firms have ROA improvement after equitization because firms less than 50% state ownership in this group have a high improvement in profitability (dROA). Therefore, the Government should encourage enterprises to propose plans for quick divestment and listing of small and medium-sized enterprises.

For unlisted firms

Equitized SOEs should also actively list their securities on the stock market to raise capital and develop the stock market in Vietnam. Most equitized SOEs do not list immediately after equitization. Listing delay is unpopular in China. Chinese stocks are classified into different types for national and international investors. China opened the Shanghai Stock Exchange in December 1989 and the Shenzhen Stock Exchange in April 1991 (Fung *et al.*, 2006).

Unlisted firms experience no firm performance improvements compared with non-participating firms. Thus, investors should consider carefully before investing in IPOs, and they have to wait when investing in IPO transactions because equitized SOEs are also not listed immediately after equitization.

The Vietnamese Government also needs to encourage firms to list on the official stock exchanges (HOSE and HNX) using supportive policies and eliminating unnecessary procedures. Research results show that equitized SOEs delay listing after equitization. There are two main regulations on the stock listing, including laws on securities (2019) and Decree 155/2020/NĐ-CP. These two legal bases are very specific and clear giving instructions for firms to register for trading and listing on the stock market. According to the report by the Department of Corporate Finance (The Ministry of Finance), there are 759 unlisted equitized SOEs in Vietnam up to 2020. There are many reasons why firms do not list after equitization in Vietnam. However, low firm performance and lack of transparency/ adequate disclosure reports lead to a listing delay in Vietnam. Besides, Decree 140/2020/ND-CP indicates that when making IPO plans, equitized SOEs must concurrently make the depository registration plan and the transaction registration plan on the stock market. The listing at the Stock Exchange is carried out after equitization and equitized SOEs meet the listing conditions as prescribed by the law on securities. Thus, the Government should

regulate a specific period for submitting the depository registration plan and the transaction registration plan for listing. According to this Decree, within a maximum period of 90 days from the end of the public offering of shares, equitized SOEs must complete the procedures for depository registration of shares at the Vietnam Securities Depository and register for trading on the Upcom transaction system.

Currently, the Ministry of Finance has only publicized the list of unlisted enterprises after equitization but unlisted equitized SOEs still postpone listing registration. Decree 156/2020/ND-CP provides guidances for sanctioning administrative violations but the administrative sanction is not strictly enough for equitized SOEs to register for listing and trading on the stock market. Thus, the author suggests that there should be regulations that severely sanction equitized SOEs that refuse to list despite meeting all listing conditions, especially specifying a specific time and roadmap for enterprises to list. It is necessary to strengthen the inspection and examination of these equitized SOEs to have suitable sanctions for these firms. There must be strict sanctions to promote quick listing registration to ensure the interests of small shareholders and develop the financial market in Vietnam.

Listing delays have led to the underdevelopment of the Vietnamese stock market as firms that are not listed are familiar with small operating activities and do not have long-term operation strategies. Firm owners do not see any benefits from listing, but they have to prepare many procedures or reports before and after listing in Vietnam. Owners from equitized SOEs direct the representative of the state capital to urge equitized enterprises to strictly comply with the registration of trading and listing on the stock market under the law. The research results show that there is a listing delay, leading to IPO investors being less interested in investing in this channel. The slow listing of firms makes the market capitalization rate of the stock market still not meet its development potential.

5.2.5 Underpricing of equitized state-owned enterprises through the initial public offering

Figure 5.8 shows underpricing results for equitized SOEs groups through IPOs according to industry groups, firm size and economic crisis event (2008).

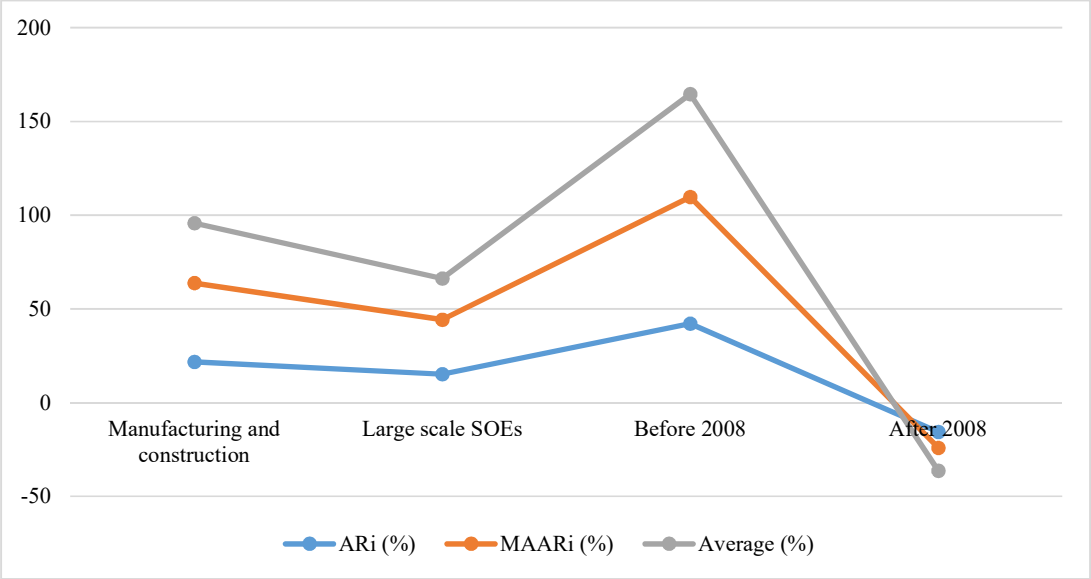

Figure 5.8. The average value of the short-run underpricing measures

Source: Author's data analysis

There is an underpricing phenomenon in the short-run ($MAAR_i$ (%) also reaches an average of 26.129 %). However, there is no underpricing in the short run considering AR_i (%). Research results show that equitized SOEs through the IPO method set a low price to attract IPO investment. Underpricing level varies according to the industry group, firm size and financial crisis. These results help investors realize that they should invest in IPOs when firms go public or equitized in Vietnam. Investors should consider industry groups and firm size before investing in IPOs. However, underpricing no longer exists in the long run and is statistically significant from the twelfth month for AR_t and from the fourteenth month for $CAR_{0,t}$. This result shows that the market adjusts the stock price below IPO offer prices in the long run. This result explains that investors should not hold IPO shares for a long time and they should sell in the short run to get initial returns. Also, investors should care about listing delays of equitized firms in Vietnam before making an IPO investment. There is underpricing in the short run and overpricing in the long run. Thus, equitized SOEs should choose and propose to the Government to go public through IPOs because IPOs have advantages over direct sales. When going public through IPOs, equitized SOEs can reduce negative issues and state assets losses through an auction mechanism. In Vietnam, there are three IPOs methods to identify IPO

prices including auctions, fixed prices and book building. The Vietnamese government encouraged equitized SOEs to apply book building since 2018 but most of the equitized SOEs have applied auctions and fixed prices when they go public through equitization.

For firms in manufacturing and construction group

Firms in manufacturing and construction tend to underprice (AR_i reaches 21.778% on average and $MAAR_i$ reaches 42.017% on average). Firm in agriculture, forestry and fishery underprice 27.205% considering AR_i (%). However, there is no underpricing of firms in the service sector. Thus, Investors also need to consider investing in industries with short-term underpricing (manufacturing and construction, agriculture, forestry and fishery and they should not invest in firms in the service sector (transportation, retail, hotel, tourism, telecommunications, banking, insurance and real estate).

For large-scale firms

Small and medium-sized SOEs do not underprice in the short-run while there is underpricing of large-scale SOEs (AR_i reaches 15.066% on average and $MAAR_i$ reaches 29.058% on average). Investors should not invest IPOs deals in small and medium-sized SOEs since they can not get initial returns when firms are listed on the stock market. However, they should invest in large-scale SOEs to get high initial returns. However, there should be a suitable supervisory mechanism for large-scale SOEs to make sure these firms do not underprice too much to lose state capital through IPOs. Underpricing can attract investors to make investment decisions but also lead to the state capital losses in equitization programs through IPOs.

For equitized SOEs conducted IPOs before and after the economic crisis

Non-equitized SOEs should analyze economic perspectives and choose a suitable time for proposing an equitization schedule to the equitization steering committee because there is overpricing after the economic crisis, leading to low market stock prices.

There is an underpricing phenomenon of firms equitized before and after the financial crisis. Market risks can affect IPO activity and prices. Equitized SOEs should not apply the IPO method when there are market risks or uncertainty because investors

may not be willing to pay at high prices for IPOs deals and securities prices when equitized SOEs list their securities on the Vietnamese stock market. When investors set low prices of IPO deals, it is easy to create state assets losses and unsuccessful IPOs when firms go public. For example, there were still many unsuccessful IPOs from 2011 to 2016 and the number of successful shares was limited, such as Machinery and Industrial Equipment Corporation only reached 0.1%, Vinafood1 Flour Company reached 4%, Tan Bien Rubber Company reached 0.4 %, Gia Lai Water Supply Company reached 0.04%, GENCO3 reached 2.8%, etc. Investors also should not pay at high prices for listed securities after IPOs during market uncertainty because there are low prices of securities. However, investors should not hold securities from IPOs deals for a long time due to overpricing in the long run in Vietnam.

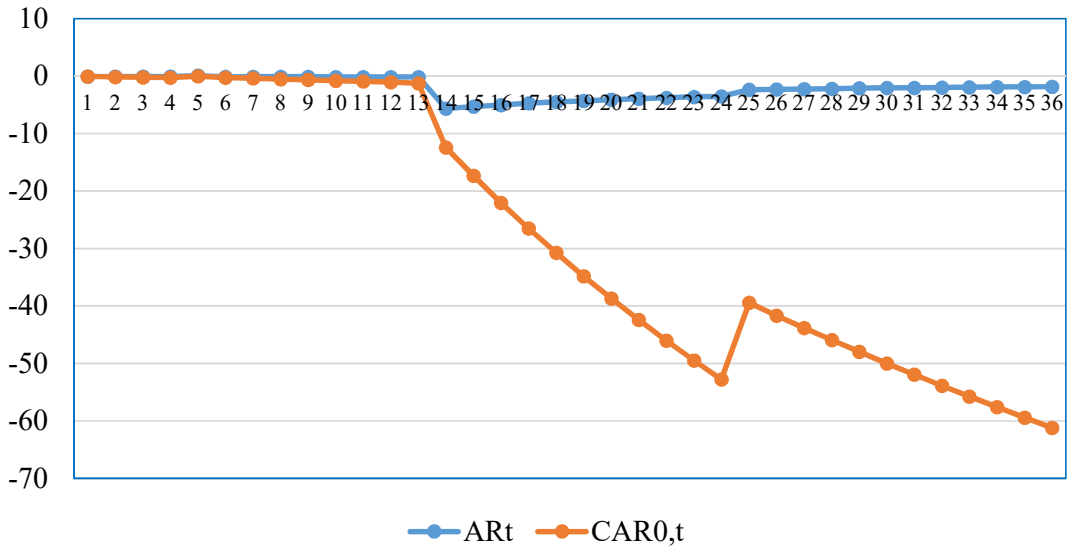

Figure 5.9. Fluctuation of the long-run underpricing measures

Source: Author's analysis

Figure 5.9 shows the average values of the IPO long-term underpricing measures (AR_t and $CAR_{0,t}$). However, the market adjusts to stock prices in the long run and IPOs no longer have underpricing phenomenon, especially $CAR_{0,t}$. This result shows that state-owned enterprises have underpricing phenomenon in the short run, but there is a phenomenon of over-pricing in the long term. Thus, investors should not hold securities in the long run after equitization through IPOs because they can not get

initial returns. Investors may choose a suitable time to make a "buy" or "sell" decision but they should not hold securities of IPOs firms for a long time. According to the efficient market theory, although firms tend to underprice IPOs, the market prices will reflect all available information related to firms and adjust security prices.

The government should issue instructions for Decree 126/2017/ND-CP because there have been inconsistent applications in the country. There are many requirements and procedures to get approval before the time of equitization decision. There are also slow and complicated asset valuation procedures leading to slow equitization progress in Vietnam. The Government has issued many regulations and documents about equitization, leading to difficulties to apply because there have been changes in regulations and criteria. Equitization through direct sales has certain limitations where there is not enough transparent information to attract external investors, especially foreign investors to invest in equitized SOEs.

According to the Decree 150/2020/ND-CP and the Circular 111/2020/TT-BTC, the firm valuation is based on the assets method and other methods. The actual value of public organizations is the value of the total assets at the time of asset valuation after re-evaluation, including the branding value of public organizations (if any). These Decree and Circular give detailed instructions on the assets method for public organizations to participate in equitization programs. According to the Decree 150/2020/ND-CP, each public organization needs to apply at least 02 different valuation methods (including the asset valuation method specified in this Decree). In the case only one method is employed to determine the value of public organization, the valuation consultancy organization must report the reason for the insufficient basis for applying other methods to competent authorities for approval.

To avoid underpricing, the Government should specify more valuation methods to give specific instructions for public organizations to follow and the State Audit Office of Viet Nam can easily re-evaluate the actual value of these organizations to avoid state capital losses, such as discounted cash flow valuation, market value valuation method, etc. Besides, the state audit office of Vietnam should check abnormal firm valuation in equitization plans of SOEs to avoid too much underpricing, leading to unexpected state

capital losses. The state audit office of Vietnam must have important roles in the Steering committee of equitization in firm valuation, especially for multi-industry firms and large-scale firms. The government should issue regulations for pricing violations if assets pricing service companies in case equitized SOEs ask these companies for state assets pricing to prepare for equitization.

5.3 Limitation of the study and suggestions for further research

This dissertation has tried to full fill five gaps as stated in chapter 1. However, this dissertation has certain limitations: (1) This study has not considered different assets valuation and depreciation methods due to data limitation from VGSO; (2) Due to data limitations, the dissertation can not examine how the short-run underpricing affects firm performance changes after equitization in Vietnam; (3) The study has not considered the macroeconomic and micro factors that can affect firm performance after equitization. Thus, research results show that R^2 is only 10.9% (dependent variable of dROA) and R^2 is only 7.85% (dependent variable of dTAS). Also, studying some certain equitized SOEs cases to understand how equitization impacts on firm performance should be conducted since this dissertation mainly focuses on quantitative research methodology. Therefore, the author calls for the next research works to overcome the above research limitations.

5.4 Summary of chapter 5

This chapter summarizes vital quantitative research findings, including the underpricing phenomenon testing, the impact of equitization on firm performance changes when considering non-equitized firms in the same period. This dissertation also applies a regression approach to evaluate the impact of equitization (tax incentives) on firm performance. This dissertation includes some recommendations based on empirical results and five research gaps. There are also some recommendations for the Vietnamese Government to foster equitization and have sufficient policies related to equitization and listing. Finally, the author represents the limitations of the dissertation and suggestions for further research.

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APPENDICES

Appendix 1. Empirical studies on the privatization impact on firm performance changes

Firm performance measure	Increased after privatization (positive)	Decreased after privatization (negative)	No significance
Profitability	Dewenter and Malatesta (2001) Megginson et al. (1994) Megginson (2017b) Rakhman (2018) Mager and Jesswein (2010) Farinos, Garcia, and Ibanez (2007) D'Souza et al. (2005) Boubakri et al. (2005) Boubakri et al. (2004) Ochieng and Ahmed (2014) Sakr (2014) Tsamenyi et al. (2010) Grygorenko and Lutz (2007) Naceur et al. (2007) Kang and Kim (2012) Huang and Wang (2011) Chen et al. (2008) Rousseau and Sheng (2008) Loc et al. (2006) C. D. Pham (2017) D. C. Pham and Nguyen (2019)	Chen et al. (2006) Fan et al. (2014) Tu et al. (2013) Yu, 2013	Harper (2002) Farinos et al. (2007) Farinos et al. (2007) Bachiller (2012) Tatahi (2013) Alipour (2013) Oqdeh and Abu Nassar (2011) Hakro and Akram (2009)
Operating efficiency	Brown et al. (2016) Mager and Jesswein (2010) Farinos et al. (2007) Farinos et al. (2007) D'Souza et al. (2005) W. L. Megginson (2017b) Boubakri et al. (2005) Boubakri et al. (2004) Ochieng and Ahmed (2014) Sakr (2014) Wang (2009) Naceur et al. (2007) Wei et al. (2003) Gong et al. (2012) Huang and Wang (2011) Loc et al. (2006)	Fan et al. (2014) Tu et al. (2013) Yu, 2013 C. D. Pham (2017), D. C. Pham and Nguyen (2019)	Harper (2002) Tatahi (2013) Alipour (2013) Hakro and Akram (2009)

Firm performance measure	Increased after privatization (positive)	Decreased after privatization (negative)	No significance
Capital investment/ productivity	D'Souza et al. (2005)		Harper (2002) Farinos et al. (2007) Mager and Jesswein (2010) Farinos et al. (2007)
Output (real sales)	Mager and Jesswein (2010) Farinos et al. (2007) D'Souza et al. (2005) Boubakri et al. (2005) Grygorenko and Lutz (2007) Dewenter and Malatesta (2001), Huang and Song (2005) Loc et al. (2006) Pham (2017) Pham and Nguyen (2019)		
Employment	Farinos et al. (2007) Farinos et al. (2007)	Sakr (2014) Naceur et al. (2007)	Mager and Jesswein (2010) D'Souza et al. (2005)
Leverage		Dewenter and Malatesta (2001) D'Souza et al. (2005) Naceur et al. (2007) Wei et al. (2003)	Farinos et al. (2007) Bachiller (2012) Mager and Jesswein (2010) Farinos et al. (2007)

Source: Author's data collection

Appendix 2. Firm performance measures and predicted relationship

Variable	Proxy	Predicted relationship	Some references
P(1) Profitability	Return on Sales (ROS) = Real Net Income / Real Sales	$ROS_A > ROS_B$	Megginson et al (1994) Pham & Nguyen (2017) Bachiller (2012) Mager & Jesswein (2010) Rousseau & Sheng (2008) Arcas & Bachiller (2008) Farinos, Garcia & Ibanez (2007) Li, Moshirian, Nguyen, & Tan (2007) Huang and Song (2005)
	Return on Assets (ROA) = Real Net	$ROA_A > ROA_B$	Megginson et al (1994) Pham & Nguyen (2017)

Variable	Proxy	Predicted relationship	Some references
	Income / Real Total Assets		Tran et al. (2015) Bachiller, P. (2012) Huang & Wang (2011) Mager & Jesswein (2010) Wang (2009) Rousseau & Sheng (2008) Arcas & Bachiller (2008) Farinos, Garcia & Ibanez (2007) Li, Moshirian, Nguyen & Tan (2007) Huang and Song (2005)
	Return on Equity (ROE) = Real Net Income/ Real Equity	$ROE_A > ROE_B$	Megginson et al (1994) Pham & Nguyen (2017) Tran et al. (2015) Bachiller (2012) Huang & Wang (2011) Mager & Jesswein (2010) Rousseau & Sheng (2008) Arcas & Bachiller (2008) Farinos, Garcia & Ibanez (2007) Huang and Song (2005)
P(2) Operating efficiency	Sales Efficiency (SALEF) =Real Sales/ Number of Employees	$SALEFF_A > SALEFF_B$	Megginson et al (1994) Sakr (2015) Bachiller (2012) Oqdeh & Abu Nassar (2011) Mager & Jesswein (2010) Farinos, Garcia & Ibanez (2007) Huang and Song (2005)
	Net Income Efficiency (NIEFF) = Real Net Income/ Number of Employees	$NIEFF_A > NIEFF_B$	Megginson et al (1994) Sakr (2015) Bachiller (2012) Oqdeh & Abu Nassar (2011) Mager & Jesswein (2010) Farinos, Garcia & Ibanez (2007) Huang and Song (2005)
	Total Assets Turnover (TAS) = Real Sales/ Total Real Assets	$TAS_A > TAS_B$	Huang and Song (2005)
P(3) Output	Real Sales (RSAL) = Norminal Sales/ CPI	$RSAL_A > RSAL_B$	Megginson et al (1994) Pham & Nguyen (2017)

Variable	Proxy	Predicted relationship	Some references
			Mager & Jesswein (2010) Farinos, Garcia & Ibanez (2007) Huang and Song (2005)
P(4) Employment	Total Employment (EMPL) = Total Number of Employees	$EMPL_A < EMPL_B$	Megginson et al (1994) Bachiller (2012) Oqdeh & Abu Nassar (2011) Mager & Jesswein (2010) Farinos, Garcia & Ibanez (2007) Huang and Song (2005)
P(5) Leverage	Debt to Assets (LV) = Total Debt/ Total Assets	$LEV_A < LEV_B$	Megginson et al (1994) Pham & Nguyen (2017) Sakr (2015) Bachiller (2012) Huang & Wang (2011) Ho, Yang & Li (2011) Oqdeh, & Abu Nassar (2011) Mager & Jesswein (2010) Wang (2009) Farinos, Garcia & Ibanez (2007) Huang and Song (2005)

Source: Author's data collection

Appendix 3. Numbers of equitized SOEs from 1990 to Aug 2019

No.	Time	No. of equitized enterprises	Percentage
1	<1999	123	2.58%
2	1999	253	5.31%
3	2000	212	4.45%
4	2001	205	4.30%
5	2002	164	3.44%
6	2003	621	13.04%
7	2004	856	17.97%
8	2005	813	17.07%
9	2006	395	8.29%
10	2007	150	3.15%
11	2008	98	2.06%
12	2009	67	1.41%
13	2010	46	0.97%
14	2011	14	0.29%
15	2012	26	0.55%
16	2013	73	1.53%
17	2014	175	3.67%
18	2015	220	4.62%
19	2016	55	1.15%
20	2017	69	1.45%
21	2018	32	0.67%
22	2019-2020*	96	2.02%
23	Total	4,763	100.00%

Source: Adapted from Report of the Steering Committee for Renovation and Development, Vietnam (2020)

Appendix 4. Summary of effective legal bases for equitization in Vietnam

No.	Legal bases	Date issued	Tittles	Issued by
1	150/2020/ND-CP	12/25/2020	About transforming public organization to joint stock organization	The Prime Minister
2	155/2020/ND-CP	12/31/2020	Details on implementaion of some articles from the law on securities	The Prime Minister
3	156/2020/ND-CP	12/31/2020	Provisions on sanctions for administrative violations in for issues related to securities and stock market	The Prime Minister
4	140/2020/ND-CP	11/30/2020	Admendments and Supplements to some Articles of Decree 126/2017/ND-CP	The Prime Minister
5	32/2018/ND-CP	3/8/2018	Admendments and Supplements to some Articles of Decree 91/2015/ND-CP on October 13, 2015 of state capital investment in enterprises and management, capital usage, assets in enterprises	The Prime Minister
6	126/2017/ND-CP	11/16/2017	About transferring state-owned enterprises and limited liability companies (100% charter capital invested by the state) into joint stock companies	The Prime Minister
7	91/2015/ND-CP	10/13/2015	On investment of state capital in enterprise and management, capital usage, assets in enterprise	The Prime Minister
8	22/2021/QD-TTg	7/2/2021	On classification criteria of State-owned enterprises, enterprises with state capital implementing ownership transfer, restructuring and divestment in the period 2021-2025	The Prime Minister
9	111/2020/TT-BTC	12/29/2020	Instructions on some contents on financial handling, determination of public firm valuation, initial public offerings and management, use of revenue from transforming public organization to joint stock organization	

Source: Author's data collection

Appendix 5. Privatization/equitization comparison in some countries

No.	Characteristics	Vietnam	China	Russia
1	Privatization/equitization policies	Gradual equitization Incentive policies for equitized firms	Gradual privatization Only incentive policies for firms investing in some sectors	Mass/ Voucher privatization Budgetary subsidies, trade protection, and financial credits
2	Privatization nature	Partial equitization	Partial privatization	Full privatization
3	Privatization methods	Asset sales and share issue equitization (SIE)	Share issue privatization (SIP), joint ventures with foreign firms, management buy-outs (MBO), and sales to outsiders	Voucher privatization/ asset sales
4	Privatization phases	Three phases	Three phases	Four phases
5	Firm performance of privatized SOEs after privatization	Inconsistent results	Inconsistent results	Most privatized firms decreased sales (59.1%) and employment after privatization (64.8%) (for the sample of 171 privatized forms in Russia)
6	State ownership after equitization/ privatization	Gradual divestment The state remains high ownership (>=51%) in many equitized SOEs	Gradual divestment The state remains high ownership (>=51%) in many equitized SOEs	The State only retains high ownership in some essential SOEs.
7	Listing delay	Long listing delay	Unpopular listing delay	Rarely listing delay
8	Underpricing	There is evidence	There is evidence	There is evidence

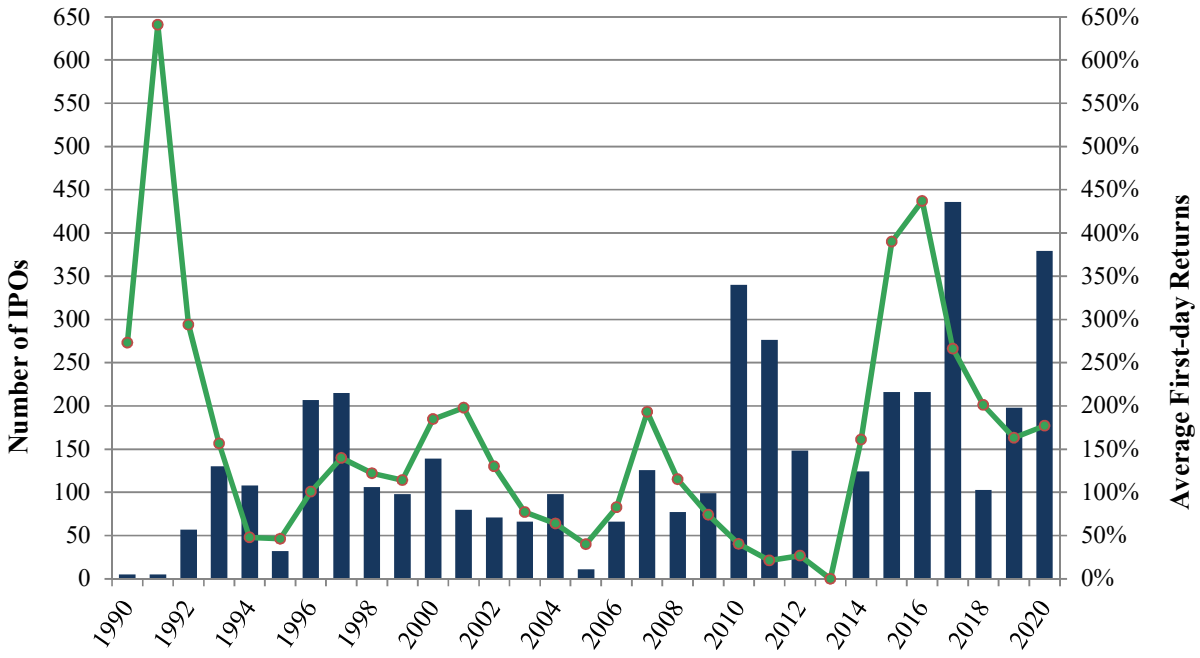
Source: Author's data collection

Appendix 6. Resources controlled by the Chinese Government

Type	Typical example
Resources liable to lead to monopoly because of a strong network effect	Waterworks networks
	Electricity grids
	Pipeline networks
	Information networks
	Radio frequency bands
Land and other natural resources	Land
	Oil
	Natural gas
	Water resources
Special permits for businesses requiring a market entry license	Business permits for some special industries (banking, insurance, securities, and telecommunications)
	Certification for participation in infrastructure and public works projects
	Various administrative permits, including certification for participation
Investment-related resources	Full direct investment
	Agency for investment projects
	Public-private partnership (PPP) investment
Resources related to industrial and investment funds	Investment funds and industrial development funds
Price-setting rights	Price setting
	Subsidy to cover the price difference
Directly or indirectly controlled state-owned property	Financial institutions controlled by the state, including banks, securities companies, and asset management companies

Source: Kwan (2020)

Appendix 7. Underpricing in China



Sources: Jia, Ritter, Xie, and Zhang (2018)

Appendix 8. Mean values of firm performance measures through pre-post equitization windows

Year		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ROS	(1)	0.013	-0.004	0.007	0.002	-0.042	0.015	0.091	0.027	0.041	0.037
	(2)	0.037	0.029	0.022	0.041	0.013	0.028	0.163	0.0007	0.043	0.018
ROA	(1)	0.017	0.004	0.028	0.009	0.007	0.010	0.068	0.021	0.027	0.037
	(2)	0.039	0.049	0.038	0.041	0.0101	0.019	0.032	0.027	0.052	0.0166
ROE	(1)	0.010	0.021	0.119	0.094	0.083	0.052	0.299	0.082	0.074	0.068
	(2)	0.116	0.161	0.099	0.102	0.075	0.071	0.056	0.081	0.138	0.068
SALEFF	(1)	627.711	901.033	1187.382	1243.498	1149.154	134547.9	361.764	396.159	1076.869	1426.907
	(2)	984.368	8345.526	2090.443	2089.134	2013.302	118159.4	289.052	520.447	1081.017	2793.513
NIEFF	(1)	13.197	3.795	7.181	19.889	32.781	965.149	35.162	12.776	46.429	37.267
	(2)	48.117	69.486	20.341	44.456	-1.642	525.264	28.021	10.558	40.824	30.702
TAS	(1)	1.298	1.578	1.585	1.719	2.893	1.67161	0.772	1.143	0.827	1.464
	(2)	1.326	1.712	1.298	1.738	2.182	1.692	0.351	0.962	0.831	1.012
n		99	43	16	12	13	4	2	27	44	35

Notes: (1) represents the pre-equitization window, and (2) represent the post-equitization window.

Source: Author's data analysis

Appendix 9. Average treatment effect by industry group

Variable	The agriculture, forestry and fishery sectors				The manufacturing and construction sectors				The service sector			
	ATE (1)	z-statistic (1)	ATE (2)	z-statistic (2)	ATE (1)	z-statistic (1)	ATE (2)	z-statistic (2)	ATE (1)	z-statistic (1)	ATE (2)	z-statistic (2)
dROA	-0.003	-0.13 (0.898)	-0.006	-0.21 (0.836)	0.025**	2.33 (0.026)	0.025***	2.76 (0.006)	0.006	0.51 (0.612)	0.006	0.57 (0.565)
dTAS	-0.149	-0.16 (0.872)	0.237	0.48 (0.629)	0.007	0.08 (0.937)	0.001	0.01 (0.989)	-0.255	-1.04 (0.300)	-0.076	-0.40 (0.692)
n before PSM	427 (414 non-equitized SOEs and 13 equitized SOEs)				568 (414 non-equitized SOEs and 154 equitized SOEs)				542 (414 non-equitized SOEs and 128 equitized SOEs)			
n after PSM	59 (46 non-equitized SOEs and 13 equitized SOEs)				355 (201 non-equitized SOEs and 154 equitized SOEs)				297 (169 non-equitized SOEs and 128 equitized SOEs)			

Source: Author's data analysis

Appendix 10. Average treatment effect by average state ownership after equitization

Variable	<20%				20% up to 30%				30% up to 50%			
	ATE (1)	z-statistic (1)	ATE (2)	z-statistic (2)	ATE (1)	z-statistic (1)	ATE (2)	z-statistic (2)	ATE (1)	z-statistic (1)	ATE (2)	z-statistic (2)
dROA	0.035**	1.65 (0.098)	0.044***	3.74 (0.000)	0.027***	2.63 (0.009)	0.028***	3.000 (0.003)	0.032***	3.000 (0.003)	0.015*	1.64 (0.100)
dTAS	-0.462	-0.96 (0.337)	-0.314	-1.31 (0.191)	-0.255	-1.53 (0.126)	-0.161	-1.30 (0.193)	0.280*	1.76 (0.079)	0.063	0.44 (0.659)
n before PSM	467 (414 non-equitized SOEs and 53 equitized SOEs)				455 (414 non-equitized SOEs and 41 equitized SOEs)				511 (414 non-equitized SOEs and 97 equitized SOEs)			
n after PSM	450 (397 non-equitized SOEs and 53 equitized SOEs)				435 (394 non-equitized SOEs and 41 equitized SOEs)				493 (396 non-equitized SOEs and 97 equitized SOEs)			

Variable	50% up to 65%				65% up to 100%			
	ATE (1)	**z-statistic (1)**	**ATE (2)**	**z-statistic (2)**	**ATE (1)**	**z-statistic (1)**	**ATE (2)**	**z-statistic (2)**
dROA	0.005	0.44 (0.660)	0.001	0.10 (0.919)	-0.054*	-1.89 (0.059)	-0.049**	-2.24 (0.025)
dTAS	0.002	0.01 (0.990)	-0.065	-0.67 (0.502)	-0.233	-1.12 (0.263)	-0.098	-0.69 (0.493)
n before PSM	466 (414 non-equitized SOEs and 52 equitized SOEs)				446 (414 non-equitized SOEs and 52 equitized SOEs)			
n after PSM	460 (408 non-equitized SOEs and 52 equitized SOEs)				402 (370 non-equitized SOEs and 52 equitized SOEs)			

Source: Author's data analysis

Appendix 11. Descriptive statistics of certain variables for equitized SOEs (for regression analysis

Variables	Observations	Mean	Std	Min	Max
dROA	295	0.018	0.092	-0.535	0.601
dTAS	295	-0.089	1.117	-10.561	5.094
dSTATE	295	-57.511	23.819	-100	-1
dLNEMPL	294	-0.286	0.652	-3.088	2.805
dLEV	295	-0.046	0.416	-1.624	3.245
LNAGE	295	2.927	0.476	2.197	4.205
dGROWTH	295	0.054	29.826	-91.874	77.244

Source: Author's data analysis

Appendix 12. Frequency statistics of certain variables for equitized SOEs (for regression analysis

Characteristics	Freq.	Percentage (%)	Cum. Percentage (%)
Tax incentives			
Without tax incentives	180	61.02	61.02
With tax incentives	115	38.98	100.00
Industry groups			
Agriculture, forestry and fishery	13	4.41	4.41
Manufacturing and construction	154	52.20	56.61
Service	128	43.39	100.00
Listing status			
Unlisted	184	62.37	62.37
Listed	111	37.63	100.00
Equitization phase			
The second phase	183	62.03	62.03
The third phase	112	37.97	100.00

Source: Author's data analysis

Appendix 13. Correlation matrix for the impact of equitization on firm performance changes

e(V)	dSTATE	TAXAD	dLNEMPL	dLEV	LNAGE	dGROWTH	IND1	IND2	LIST	PHASE	_cons
dSTATE	1.0000										
TAXAD	0.1016	1.0000									
dLNEMPL	0.0902	-0.0773	1.0000								
dLEV	-0.0464	0.1091	0.0654	1.0000							
LNAGE	0.0728	-0.0484	0.0941	0.1164	1.0000						
dGROWTH	0.0537	0.1637	0.1715	-0.0047	-0.0009	1.0000					
IND1	-0.0275	-0.1167	0.0948	0.0169	0.0454	-0.1074	1.0000				
IND2	0.1398	-0.0370	0.0741	0.0932	-0.0830	-0.1088	0.2444	1.0000			
LIST	-0.3964	0.0416	-0.1509	0.0984	-0.1100	0.0675	-0.0774	-0.0110	1.0000		
PHASE	-0.0961	0.5965	-0.0752	0.1379	-0.0219	0.0397	0.0304	0.1130	-0.0070	1.0000	
_cons	0.3637	-0.1530	0.0444	-0.1663	-0.8233	0.0153	-0.0938	-0.0422	-0.1932	-0.2753	1.0000

Source: Author's data analysis

Appendix 14. Regression results in STATA 14.2

Table 14.1 Regression (dependent variable of dROA)

```
. reg dROA dSTATE TAXAD dLNEMPL dLEV LNAGE dGROWTH IND1 IND2 LIST PHASE

      Source |       SS           df       MS      Number of obs   =       294
-------------+----------------------------------   F(10, 283)      =      3.46
       Model |  .269397718        10  .026939772   Prob > F        =    0.0003
    Residual |  2.20289286       283  .007784074   R-squared       =    0.1090
-------------+----------------------------------   Adj R-squared   =    0.0775
       Total |  2.47229058       293  .008437852   Root MSE        =    .08823

------------------------------------------------------------------------------
        dROA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dSTATE |  -.0010961   .0002509    -4.37   0.000      -.00159   -.0006023
       TAXAD |   -.018917   .0140422    -1.35   0.179    -.0465575    .0087235
     dLNEMPL |  -.0001653   .0083113    -0.02   0.984    -.0165251    .0161946
        dLEV |  -.0276217   .0127806    -2.16   0.032    -.0527787   -.0024647
       LNAGE |  -.0095609   .0111242    -0.86   0.391    -.0314575    .0123358
     dGROWTH |  -.0002598   .0001814    -1.43   0.153    -.0006168    .0000973
        IND1 |   .0201607   .0263661     0.76   0.445    -.0317378    .0720592
        IND2 |    .010178   .0111834     0.91   0.364    -.0118352    .0321912
        LIST |   .0259158   .0120452     2.15   0.032     .0022062    .0496254
       PHASE |  -.0237596   .0140196    -1.69   0.091    -.0513556    .0038363
       _cons |  -.0186392   .0363409    -0.51   0.608    -.0901719    .0528936
------------------------------------------------------------------------------

. hettest


Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of dROA

         chi2(1)      =     7.66
         Prob > chi2  =   0.0056
```

➔ HET -> Robust

```
. reg dROA dSTATE TAXAD dLNEMPL dLEV LNAGE dGROWTH IND1 IND2 LIST PHASE, robust


Linear regression                               Number of obs     =        294
                                                F(10, 283)        =       2.27
                                                Prob > F          =     0.0143
                                                R-squared         =     0.1090
                                                Root MSE          =     .08823

------------------------------------------------------------------------------
             |               Robust
        dROA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dSTATE |  -.0010961    .000331    -3.31   0.001    -.0017477   -.0004445
       TAXAD |   -.018917   .0119017    -1.59   0.113     -.042344     .00451
     dLNEMPL |  -.0001653   .0123331    -0.01   0.989    -.0244415    .0241109
        dLEV |  -.0276217   .0216496    -1.28   0.203    -.0702363    .0149929
       LNAGE |  -.0095609   .0110824    -0.86   0.389    -.0313753    .0122536
     dGROWTH |  -.0002598   .0001758    -1.48   0.141    -.0006058    .0000863
```

```
        IND1 |   .0201607   .0190562     1.06   0.291    -.0173492    .0576706
        IND2 |    .010178   .0106834     0.95   0.342    -.0108509    .0312069
        LIST |   .0259158   .0134713     1.92   0.055    -.0006008    .0524324
       PHASE |  -.0237596    .015281    -1.55   0.121    -.0538385    .0063193
       _cons |  -.0186392   .0385654    -0.48   0.629    -.0945506    .0572723
------------------------------------------------------------------------------
```

Table 14.2 Regression (dependent variable of dTAS)

```
. reg dTAS dSTATE TAXAD dLNEMPL dLEV LNAGE dGROWTH IND1 IND2 LIST PHASE

      Source |       SS           df       MS      Number of obs   =       294
-------------+----------------------------------   F(10, 283)      =      2.41
       Model |  28.7347164        10  2.87347164   Prob > F        =    0.0092
    Residual |  337.515985       283  1.19263599   R-squared       =    0.0785
-------------+----------------------------------   Adj R-squared   =    0.0459
       Total |  366.250702       293   1.2500024   Root MSE        =    1.0921

------------------------------------------------------------------------------
        dTAS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dSTATE |   .0067099   .0031056     2.16   0.032     .0005969    .0128229
       TAXAD |   .2595812   .1738148     1.49   0.136    -.0825527    .6017152
     dLNEMPL |   .2562196   .1028776     2.49   0.013     .0537171     .458722
        dLEV |   .1713967   .1581978     1.08   0.280     -.139997    .4827904
       LNAGE |   .0576546   .1376954     0.42   0.676    -.2133825    .3286917
     dGROWTH |   .0026489    .002245     1.18   0.239    -.0017703     .007068
        IND1 |   .7013847   .3263593     2.15   0.032      .058985    1.343784
        IND2 |   .3990069   .1384279     2.88   0.004      .126528    .6714858
        LIST |  -.1630655    .149096    -1.09   0.275    -.4565433    .1304123
       PHASE |   .0206492   .1735347     0.12   0.905    -.3209333    .3622317
       _cons |  -.0803273   .4498276    -0.18   0.858    -.9657598    .8051051
------------------------------------------------------------------------------
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of dTAS

         chi2(1)      =   118.71
         Prob > chi2  =   0.0000
```

➔ HET -> Robust

```
.  reg dTAS dSTATE TAXAD dLNEMPL dLEV LNAGE dGROWTH IND1 IND2 LIST PHASE, robust

Linear regression                               Number of obs     =        294
                                                F(10, 283)        =       1.95
                                                Prob > F          =     0.0385
                                                R-squared         =     0.0785
                                                Root MSE          =     1.0921

------------------------------------------------------------------------------
             |               Robust
        dTAS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dSTATE |   .0067099   .0043258     1.55   0.122     -.001805    .0152247
       TAXAD |   .2595812   .1863899     1.39   0.165    -.1073053    .6264678
     dLNEMPL |   .2562196   .0838528     3.06   0.002     .0911653    .4212738
        dLEV |   .1713967   .4301592     0.40   0.691    -.6753209    1.018114
```

```
       LNAGE |   .0576546   .1289032     0.45   0.655    -.1960761    .3113853
     dGROWTH |   .0026489   .0016528     1.60   0.110    -.0006044    .0059021
        IND1 |   .7013847   .4495562     1.56   0.120    -.1835137    1.586283
        IND2 |   .3990069   .1705055     2.34   0.020     .0633869    .7346269
        LIST |  -.1630655   .1438738    -1.13   0.258     -.446264     .120133
       PHASE |   .0206492   .1698441     0.12   0.903    -.3136688    .3549672
       _cons |  -.0803273   .3703308    -0.22   0.828    -.8092797    .6486251
------------------------------------------------------------------------------
```

Appendix 15. Data

Table 15.1 The impact of equitization on firm performance

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
1	100100015	1	10	1	0.062946	0.381163	3.332205	15.4333	1	0	1	-2	-0.97135	-0.66495	0.011653	0	1
2	100100047	3	6	1	0.013853	0.171465	3.401197	16.58492	0	0	1	-6.07	-0.27656	-0.11122	-91.874	0	1
3	100100199	3	1	1	0.033329	0.515604	2.639057	12.17472	0	0	1	-49	0.280971	-0.06426	-21.7773	1	0
4	100100262	2	10	1	0.600553	-0.03591	3.332205	12.78264	0	1	0	-87	-1.21561	0.101404	0.152288	0	1
5	100100449	2	10	1	0.10155	-0.28857	3.332205	12.5326	0	1	0	-54	0.031368	-0.23642	-0.07815	0	1
6	100100456	2	4	1	-0.0298	0.037027	4.077537	13.00187	0	1	1	-39.25	-0.0821	-0.00324	-6.52533	0	0
7	100100512	2	5	1	0.02329	-0.30873	3.218876	14.44157	0	1	1	-13.88	-0.98762	0.428926	-0.11803	0	0
8	100100689	3	1	1	0.06331	-0.46003	3.218876	12.44212	0	0	1	-32.56	0.016056	0.036225	-28.2013	1	0
9	100100696	2	4	1	0.051995	0.15846	3.806662	12.42959	0	1	1	-40	0.308395	-0.06085	-12.1765	0	0
10	100100819	2	1	1	-0.00839	0.259385	4.110874	10.26726	0	1	0	-69.5	-0.42017	-0.06154	-42.367	1	0
11	100100858	2	3	1	0.079128	0.111711	2.397895	11.95972	0	1	0	-19	0.632746	-0.16424	30.83367	0	0
12	100100939	2	10	1	-0.06705	-0.49646	4.158883	12.025412	0	1	1	-32	-0.38501	-0.08017	-0.17127	0	1
13	100100985	2	1	1	0.019345	0.919425	3.295837	12.08847	0	1	0	-54.5	-0.22968	-0.02188	-22.2447	1	0
14	100101410	2	2	1	-0.00945	-0.11532	3.258097	11.43854	0	1	0	-85	0.371949	-0.10923	32.65402	1	0
15	100101499	3	1	1	0.12586	0.106285	3.78419	10.26259	0	0	0	-88	-0.1491	-0.15718	3.66472	1	0
16	100101555	2	1	1	-0.0175	1.107408	3.367296	10.17049	0	1	1	-58.75	-0.37234	-0.30309	8.405099	1	0
17	100101971	3	2	1	0.019944	0.001594	3.258097	10.70697	0	0	0	-67.5	-1.22645	-0.04309	46.61984	1	0
18	100102446	3	10	1	-0.03994	-0.20827	3.555348	10.776044	0	0	1	-46	-0.2616	-0.29821	-0.08918	0	1
19	100102566	3	3	1	-0.0084	-0.63265	3.044522	9.760367	0	0	0	-52	-1.20576	0.194548	-16.0554	0	0
20	100102573	3	2	1	-0.023	1.008424	2.564949	9.51	0	0	0	-73	-0.78961	-0.12419	13.80246	1	0
21	100102887	2	8	1	-0.01353	-0.16679	2.772589	10.57121	0	1	0	-83	-0.73386	0.096065	54.43986	0	1
22	100102950	1	2	1	0.080599	5.09414	3.610918	10.68556	1	0	0	-70	-0.45096	-0.08883	59.35969	0	0
23	100103087	3	10	1	-0.01668	-0.52744	3.258097	13.137686	0	0	1	-2	0.204332	-0.10687	0.181881	0	1

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
24	100103094	2	2	1	-0.18751	-0.25032	3.178054	9.812961	0	1	0	-22	-0.39072	-0.70254	33.69047	0	0
25	100103175	3	3	1	0.014705	-0.35523	2.397895	11.93182	0	0	0	-51	-0.34013	0.19056	24.63658	0	0
26	100103312	2	1	1	-0.01388	-0.54592	3.258097	10.36958	0	1	0	-100	0.353771	0.051594	4.258541	1	0
27	100103390	3	2	1	0.03278	0.287936	3.258097	10.22818	0	0	0	-68.25	-0.49996	-0.00195	-3.6885	1	0
28	100103457	2	2	1	0.047342	0.522214	3.295837	12.27097	0	1	0	-53	-0.93491	-0.09337	40.70511	0	0
29	100103721	3	10	1	-0.23376	0.013702	3.332205	13.41666	0	0	1	-19	-0.43597	0.160959	-0.49964	0	1
30	100103778	3	1	1	0.078632	0.02149	3.258097	10.7364	0	0	0	-50.5	0.003891	-0.26219	-7.10266	1	0
31	100103841	2	1	1	0.021818	0.248654	3.332205	11.30634	0	1	0	-95.75	0.616723	-0.06031	31.94291	1	0
32	100103915	2	10	1	-0.03828	-0.13938	3.218876	12.96098	0	1	0	-49	-1.32789	-0.01447	0.38358	0	1
33	100104436	2	2	1	0.025832	0.140904	3.091042	12.18909	0	1	0	-61.75	-0.90329	-0.10468	13.26334	0	0
34	100104563	2	1	1	0.06579	-0.21804	3.7612	12.39375	0	1	1	-72.65	0.994602	-0.21615	-36.4557	1	0
35	100104757	1	2	1	0.129988	0.797227	2.397895	10.53718	1	0	0	-67	-0.38285	0.071023	64.01064	0	0
36	100104926	2	1	1	0.013654	0.122171	3.044522	11.50388	0	1	0	-63	-0.26448	-0.07639	-12.4692	1	0
37	100104997	2	1	1	0.225925	0.410315	3.218876	10.89158	0	1	1	-56	0.044708	-0.2713	18.43652	1	0
38	100105020	2	9	1	0.02013	0.181815	3.178054	14.25902	0	1	1	-72.4625	0.334633	-0.26378	-62.5453	0	1
39	100105292	2	10	1	-0.00899	-0.04936	2.772589	12.35973	0	1	0	-35	0.034733	-0.29627	-0.25593	0	1
40	100105334	2	1	1	-0.01429	-0.70701	3.091042	11.59882	0	1	0	-61	-0.35315	-0.09835	-9.5221	1	0
41	100105380	2	2	1	0.002016	-0.12047	3.295837	13.53993	0	1	1	-56.9	0.072413	0.128207	10.07385	0	0
42	100105398	2	2	1	0.08186	-0.30056	3.295837	12.77773	0	1	0	-65	-1.35916	-0.12516	5.912876	1	0
43	100105493	2	1	1	0.080831	0.48065	3.044522	12.05798	0	1	1	-63.69	-0.13524	-0.2631	-13.3263	1	0
44	100105648	2	1	1	0.023124	0.120171	3.988984	11.5426	0	1	0	-84	-0.09462	0.05233	2.226076	1	0
45	100105687	2	1	1	0.003707	-0.08118	3.258097	10.99311	0	1	0	-51	-0.57659	0.148346	-20.8	1	0
46	100105750	2	1	1	-0.08035	0.052942	3.178054	11.86425	0	1	0	-22.2	-0.74208	0.175481	28.04247	1	0
47	100105905	2	1	1	0.005953	-0.07802	3.295837	11.61606	0	1	0	-64	-0.60148	-0.20965	-18.6136	1	0
48	100105912	2	1	1	-0.0187	-0.64662	3.218876	10.86611	0	1	0	-60	-0.67044	0.129638	-33.8156	1	0
49	100105976	2	9	1	-0.00073	-0.03761	3.78419	14.17099	0	1	1	-1.84	-1.10604	0.057002	59.65256	0	1

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
50	100106137	3	1	1	0.039655	2.982256	3.295837	11.8033	0	0	0	-100	-1.16383	0.192586	4.610677	1	0
51	100106151	2	2	1	0.060683	0.274258	2.564949	12.8763	0	1	0	-55	0.449658	-0.06127	-4.49596	1	0
52	100106190	3	10	1	-0.02108	-0.83519	3.367296	11.79136	0	0	1	-43.5	-0.49571	-0.11043	0.283034	0	1
53	100106257	2	2	1	0.009092	0.081406	3.401197	12.27727	0	1	1	-74.5	-0.17421	-0.05901	-21.9194	1	0
54	100106264	3	10	1	-0.01701	0.385101	2.890372	15.839261	0	0	1	-28.5	-0.62443	-0.23757	0.557209	0	1
55	100106338	2	9	1	-0.01068	-0.4873	3.044522	15.47189	0	1	1	-25.8775	-0.15415	-0.13088	-11.8853	0	1
56	100106440	2	9	1	-0.13022	-0.44043	2.564949	12.16786	0	1	1	-44.9675	-0.04219	0.247544	53.41029	0	1
57	100106560	2	2	1	0.134879	0.347586	4.127134	11.22035	0	1	0	-75	-0.16007	-0.56063	13.22448	0	0
58	100106779	3	9	1	-0.04948	-2.61055	3.178054	13.8208	0	0	0	-81	-0.30786	-0.27823	-8.78283	0	1
59	100106793	2	1	1	0.006421	-1.71677	3.135494	11.34753	0	1	0	-87	-0.92639	-0.14792	-37.4025	1	0
60	100106881	3	2	1	0.01052	0.106793	3.401197	10.96006	0	0	0	-87.25	-0.39007	-0.09599	-21.8203	0	0
61	100107042	2	1	1	0.07061	0.322318	3.295837	12.22766	0	1	1	-83.6575	2.805401	-0.93187	-76.5937	1	0
62	100107074	2	1	1	0.002764	-0.00417	2.639057	10.68114	0	1	0	-87.25	0.213093	-0.16393	-8.73816	1	0
63	100107123	3	9	1	0.011885	0.148714	4.077537	11.97736	0	0	1	-42.24	-0.37517	-0.1667	45.73524	0	1
64	100107155	3	10	1	-0.5351	-0.0333	3.496508	13.40767	0	0	0	-19	-0.57246	0.242793	0.045629	0	1
65	100107370	3	6	1	-0.01441	-1.03537	3.218876	17.86918	0	0	1	-16.15	0.052644	-0.12601	-18.7912	0	1
66	100107388	3	10	1	-0.12687	-0.13146	2.197225	13.70552	0	0	0	-55	-0.68822	0.121911	-0.24092	0	1
67	100107405	3	1	1	0.021351	1.799158	3.295837	11.60273	0	0	0	-44	-0.79147	-0.05785	-24.3412	1	0
68	100107437	3	10	1	-0.03033	-1.32938	2.833213	12.45726	0	0	1	-47	-0.88617	-0.84696	-0.02555	0	1
69	100107483	3	1	1	-0.3463	-0.94964	3.295837	9.077609	0	0	0	-22	-0.53262	-1.37471	-6.1053	1	0
70	100107589	3	10	1	0.022812	-0.91997	3.332205	9.95278	0	0	0	-58	-0.53318	-0.23754	0.215465	0	1
71	100107652	3	8	1	0.128014	-1.02744	3.258097	10.52688	0	0	0	-77.5	-0.56693	-0.43295	10.58031	0	1
72	100107839	3	9	1	0.535776	-0.44275	3.178054	13.06004	0	0	0	-92.75	0.437122	-0.49803	-48.0596	0	1
73	100108007	3	1	1	0.030882	-0.04772	3.295837	10.20315	0	0	1	-79.75	-0.65858	-0.2589	-19.6834	1	0
74	100108039	3	4	1	0.010767	-1.7683	2.302585	13.67506	0	0	0	-51	0.010238	-0.29709	6.248569	0	0
75	100108173	2	9	1	0.007094	-0.16916	3.258097	16.08257	0	1	1	-28.765	0.263633	-0.30509	35.66826	0	1

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
76	100108335	3	10	1	-0.00192	-0.21573	3.332205	13.896	0	0	0	-75	-0.35686	-0.03162	-0.45541	0	1
77	100108769	2	8	1	-0.0023	-0.21775	3.295837	12.29236	0	1	0	-85	-0.97525	-0.04059	3.519278	0	1
78	100108825	2	1	1	0.010204	0.695368	3.295837	11.34939	0	1	0	-68.5	0.111127	0.012254	-19.1117	1	0
79	100108991	2	1	1	0.033398	0.036898	3.044522	9.99374	0	1	0	-88.5	0.040166	-0.21635	-4.13488	1	0
80	100109025	3	1	1	0.066531	-1.99003	3.295837	10.02127	0	0	0	-60	-0.76103	0.00247	-21.7304	1	0
81	100109032	2	10	1	-0.00558	0.319007	4.204693	12.68455	0	1	1	-86	-0.01911	-0.1944	0.116544	0	1
82	100109297	2	1	1	0.048254	-0.23398	3.218876	11.57918	0	1	0	-76	0.025393	-0.16723	7.275018	1	0
83	100109441	2	2	1	-0.00874	-0.65037	2.484907	14.01633	0	1	0	-45.5	-2.35605	-0.1041	-20.4727	0	0
84	100109561	2	1	1	0.021051	0.302595	3.091042	10.24927	0	1	1	-71	-0.03649	-0.05333	37.13661	1	0
85	100109593	2	10	1	-0.00608	-0.16776	3.332205	12.01191	0	1	0	-85	-0.90639	-0.14018	-0.18531	0	1
86	100109875	2	9	1	-0.00981	-0.53972	3.295837	12.36201	0	1	0	-35	-1.21066	-0.18759	-8.90689	0	1
87	100110302	3	10	1	0.024648	1.256692	3.688879	10.59696	0	0	1	-63	-0.18232	-0.48719	0.034481	0	1
88	100110415	3	10	1	0.028044	0.082128	3.465736	12.181792	0	0	1	-2	0.047939	0.018145	0.253887	0	1
89	100110542	2	2	1	0.046602	-0.74684	3.89182	11.82036	0	1	0	-81	-0.22398	-0.12924	-17.9464	1	0
90	100110574	2	9	1	-0.0988	-0.68921	3.663562	11.6109	0	1	0	-50	-1.62721	-0.16615	62.9144	0	1
91	100110870	2	1	1	0.021243	0.196201	3.295837	9.442087	0	1	0	-75.25	-0.27096	-0.10809	22.68552	1	0
92	100111031	2	7	1	-0.10168	-0.70882	2.564949	11.76016	0	1	0	-18	-1.0868	-0.19823	36.68483	0	1
93	100111225	2	10	1	-0.049	-0.27124	3.583519	12.38221	0	1	0	-51	-0.1416	0.007162	-0.02346	0	1
94	100111338	2	9	1	0.012725	0.417043	3.295837	11.6474	0	1	0	-100	-0.23551	-0.12765	-38.3452	0	1
95	100111874	2	1	1	0.026759	0.401834	3.295837	9.517899	0	1	0	-88.25	2.246676	0.038311	42.60482	1	0
96	100114145	1	10	1	0.000536	-0.00911	3.332205	11.564793	1	0	1	-38.5	-0.31865	0.262676	0.163695	0	1
97	100123319	2	2	1	-0.00033	-0.45846	3.091042	11.26169	0	1	1	-75	0.00874	0.047094	-21.9102	1	0
98	100124376	3	10	1	-0.43484	0.671527	2.197225	11.69927	0	0	0	-50.5	2.512815	0.465989	-0.12604	0	1
99	100151161	3	2	1	-0.01573	1.927314	3.178054	15.32386	0	0	1	-52	0.6391	-0.23599	28.39864	1	0
100	100202095	2	9	1	-0.00472	-0.25963	2.302585	13.60314	0	1	0	-63	-0.62637	-0.07862	-4.38349	0	1
101	100510766	3	2	1	0.001747	0.5551	3.258097	10.19988	0	0	0	-55	-0.15012	0.010086	-9.79924	0	0

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
102	100779365	2	6	1	0.030931	0.861272	3.044522	13.76338	0	1	1	-17.25	-1.36442	-0.30767	63.44677	0	1
103	100881841	2	10	1	0.004496	0.120772	3.091042	11.326269	0	1	0	-64	-0.89048	-0.85916	-0.05591	0	1
104	100888822	3	10	1	0.033555	-0.13855	3.091042	10.1445	0	0	0	-64	-0.02811	-0.65175	-0.15862	0	1
105	100931299	3	5	1	0.029095	0.298126	2.995732	14.73118	0	0	1	-33.5	0.612941	0.172635	-1.14156	0	0
106	101003060	3	5	1	0.117038	0.104475	2.995732	14.22176	0	0	1	-16.03	0.095619	-0.6297	-5.90342	0	0
107	101011181	2	1	1	-0.01643	0.431297	2.944439	8.629271	0	1	0	-71	0.128121	0.25702	20.26473	1	0
108	101038419	2	4	1	0.004091	0.313745	2.944439	12.75557	0	1	0	-82.75	-0.81013	-0.08484	-21.0848	0	0
109	101269906	3	10	1	-0.00189	-10.5614	2.944439	10.8401	0	0	0	-100	-0.33968	-1.6237	0.082116	0	1
110	101326329	2	10	1	0.010854	-2.05776	2.890372	9.80549	0	1	1	-94	0.058224	-0.15625	0.248192	0	1
111	101334094	3	10	1	0.018248	-0.42145	2.890372	12.0077	0	0	0	-73.5	-0.4012	-0.30765	-0.40798	0	1
112	101385740	3	10	1	-0.10335	0.86278	2.890372	13.27714	0	0	0	-32.2	-0.83017	0.756268	0.352266	0	1
113	101394512	3	4	1	-0.02744	-0.81347	2.302585	13.41444	0	0	1	-49	-0.55571	-0.07923	-14.9434	0	0
114	101482060	2	2	1	0.011223	0.343674	2.772589	12.9905	0	1	1	-20.87	0.09897	-0.04739	-0.51	0	0
115	101908912	3	10	1	0.026331	0.01202	2.70805	10.253781	0	0	1	-75	0.040822	0.239147	-0.17391	0	1
116	102576353	3	9	1	-0.03153	0.089613	2.484907	13.14002	0	0	0	-100	-0.0656	0.006132	4.469367	0	1
117	104297034	2	10	1	0.109532	-0.3449	2.397895	14.097113	0	1	1	-1	0.18687	0.089762	-0.07634	0	1
118	104394831	3	10	1	-0.00293	0.103703	2.397895	14.183033	0	0	0	-49	-0.48621	0.131363	0.191197	0	1
119	104575757	3	10	1	-0.00902	-0.74353	2.397895	10.732445	0	0	1	-48	-0.13319	-0.0867	-0.23075	0	1
120	104581944	3	10	1	-0.00354	-0.12255	2.397895	11.971089	0	0	0	-45.75	-0.15204	0.260232	-0.2259	0	1
121	104945528	3	10	1	-0.04904	0.041548	2.397895	12.57935	0	0	0	-54.75	-0.13171	-0.27019	-0.3738	0	1
122	200119700	3	1	1	-0.04173	-0.22561	2.564949	10.06705	0	0	0	-42.5	-0.05102	0.057702	-64.1198	1	0
123	200123506	3	9	1	0.111412	-0.61823	2.302585	10.62432	0	0	0	-67.5	1.56911	-0.0449	8.501624	0	1
124	200138929	3	1	1	-0.01808	0.222449	2.564949	7.886833	0	0	0	-80	-0.0107	0.175948	-15.5391	1	0
125	200145820	2	1	1	0.003631	-0.30578	2.564949	10.59355	0	1	0	-55.5	-1.46275	0.046107	21.53871	1	0
126	200150563	2	2	1	0.004794	-0.24596	2.564949	10.91431	0	1	0	-71	-0.75863	-0.0538	19.06792	1	0
127	200154293	1	1	1	-0.01391	-0.85712	3.178054	10.38096	1	0	0	-77.5	-2.36797	-0.11988	64.49092	1	0

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
128	200156188	2	2	1	0.029194	-0.20197	2.484907	9.638284	0	1	0	-51	-0.73744	-0.18391	-1.22775	0	0
129	200156533	2	5	1	0.004355	-0.17589	2.302585	10.77031	0	1	0	-85.25	0.559863	0.238044	-0.51532	0	0
130	200157840	2	8	1	0.003156	-0.11963	2.197225	13.96617	0	1	1	-6	-0.81686	0.031922	18.06854	0	1
131	200157992	2	9	1	-0.01391	0.072531	2.197225	12.11711	0	1	0	-100	-0.37921	-0.2393	-5.02455	0	1
132	200159340	2	2	1	-0.00028	0.328585	2.484907	9.570111	0	1	0	-94.5	-0.95019	0.041736	54.94607	0	0
133	200236845	3	9	1	0.023743	-0.28962	2.397895	15.34506	0	0	1	-7.33	-0.56264	-0.25093	-15.2982	0	1
134	200406511	3	2	1	-0.04191	-1.2418	2.484907	11.80261	0	0	0	-49	-0.34318	-0.03357	31.3499	0	0
135	200572501	2	9	1	0.122642	0.461364	2.772589	11.93056	0	1	1	-75.145	0.289033	0.038123	12.88605	0	1
136	200827051	2	9	1	-0.07959	0.148688	2.397895	14.93087	0	1	1	-36	-0.01112	-0.23356	-10.5218	0	1
137	300381966	2	3	1	0.013006	-0.43754	2.70805	7.069874	0	1	1	-34.15	-0.26986	-0.09019	-21.2966	0	0
138	300385255	2	1	1	-0.06859	0.138671	2.564949	11.84334	0	1	0	-49	-0.57271	-0.03987	22.99215	1	0
139	300393538	2	3	1	0.005447	-0.51933	3.295837	13.31242	0	1	1	-40	-1.58991	0.053454	3.40505	0	0
140	300422482	2	9	1	-0.00136	-0.07284	2.564949	13.02193	0	1	1	-13.63	-0.26359	-0.14625	3.976114	0	1
141	300430099	3	9	1	0.005975	-0.03066	3.7612	11.58375	0	0	1	-51	-0.43723	-0.32373	-9.90773	0	1
142	300437898	3	1	1	-0.00603	-0.31533	4.143135	8.669743	0	0	1	-49	-1.75738	0.227349	45.44257	1	0
143	300448709	3	1	1	0.008666	-0.64179	3.806662	14.01758	0	0	1	-40	-0.06484	0.022304	-36.6262	1	0
144	300452060	3	1	1	0.044417	0.032852	3.135494	13.22006	0	0	1	-54.5	-0.37674	0.331833	18.89193	1	0
145	300479760	3	1	1	0.009655	0.320264	2.564949	13.95075	0	0	1	-72.895	0.250636	-0.01528	-8.58114	1	0
146	300523755	2	1	1	-0.21967	-1.41888	3.295837	13.15381	0	1	1	-51.5	-0.3573	0.522891	-37.089	1	0
147	300585984	3	9	1	0.053567	0.118358	3.044522	14.79825	0	0	1	-63.7	0.02453	-0.21529	-75.4388	0	1
148	300610077	3	1	1	0.023146	1.171468	3.295837	12.36155	0	0	0	-65.75	-0.69468	-0.15554	53.69607	1	0
149	300760795	2	3	1	0.073334	0.642376	3.295837	11.05365	0	1	0	-73	0.231802	-0.26247	54.19528	0	0
150	301042973	2	1	1	0.061403	-1.48119	3.7612	11.34596	0	1	1	-75.835	-0.21781	-0.19999	-57.0861	1	0
151	301098609	3	1	1	0.105708	-0.58043	2.564949	10.45019	0	0	0	-55	-1.22101	-0.04864	-33.8077	1	0
152	301123125	3	9	1	0.066295	0.047994	2.944439	14.49539	0	0	1	-49.5	-0.09316	-0.12261	-4.79135	0	1
153	301150295	2	2	1	0.120075	0.344014	3.044522	11.16291	0	1	1	-51.15	-0.13437	-0.47022	25.68286	0	0

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
154	301171827	3	9	1	-0.02481	0.773201	2.70805	13.48845	0	0	1	-50.93	-0.32411	-0.15708	18.70878	0	1
155	301186460	3	5	1	0.041608	-3.72	2.302585	11.79631	0	0	0	-97.25	-0.52239	2.54485	-0.30303	0	0
156	301257351	2	1	1	0.254987	-0.84593	3.688879	8.946114	0	1	0	-91.75	-0.50275	-0.2398	42.14829	1	0
157	301434709	3	4	1	-0.00063	-1.20449	3.433987	11.08397	0	0	0	-80	-0.66036	0.147052	-11.2048	0	0
158	301446006	2	3	1	0.020949	-1.20078	3.044522	14.54279	0	1	0	-49	-3.08792	-0.05688	19.25779	0	0
159	301465263	2	1	1	0.00726	0.075623	3.258097	12.26878	0	1	1	-70	-0.35433	-0.03764	4.621643	1	0
160	302017602	2	8	1	-0.01509	-0.82204	2.944439	9.158731	0	1	0	-80	-2.43361	-0.46829	77.24365	0	1
161	302166033	2	2	1	0.034464	-0.26077	2.564949	11.88282	0	1	1	-50.48	0.341223	0.097956	-14.916	1	0
162	302310209	2	1	1	0.100693	0.931002	2.564949	12.19479	0	1	1	-97.0875	-1.48462	-0.43444	22.75173	1	0
163	302533156	2	1	1	-0.0192	-0.39485	2.890372	12.68525	0	1	1	-71	0.210785	-1.20286	3.030027	1	0
164	303607185	3	9	1	0.034916	0.02589	2.70805	8.011687	0	0	0	-75.5	0.149532	0.279804	18.76445	0	1
165	400100506	2	2	1	0.353934	0.790449	2.484907	10.3925	0	1	1	-52	-0.22819	-1.17732	-29.2625	0	0
166	400100947	2	5	1	0.001286	0.211873	3.78419	15.06848	0	1	0	-55	-0.40194	1.48853	28.58964	0	0
167	400101098	2	2	1	0.016532	0.086652	2.484907	11.77141	0	1	0	-47	-1.36617	-0.02363	2.90654	0	0
168	400101323	2	2	1	0.025005	-0.08504	3.332205	12.32214	0	1	1	-90	-2.07307	0.039742	30.04084	0	0
169	400101549	2	2	1	0.076809	0.752267	2.564949	12.17276	0	1	1	-70	0.039863	-0.03167	8.508349	0	0
170	400101595	3	1	1	0.02713	0.202767	2.564949	10.7047	0	0	0	-59	-0.71504	-0.19703	2.073811	1	0
171	400101676	3	1	1	0.073049	0.238828	2.639057	9.618469	0	0	1	-53.94	-0.14786	0.063068	-2.55052	1	0
172	400101901	3	5	1	-0.07961	-1.47632	3.871201	12.95365	0	0	1	-39	-0.0958	0.280729	0.029255	0	0
173	400101965	3	8	1	-0.01571	-0.26586	3.044522	11.66325	0	0	0	-77.5	0.64625	0.138669	61.57202	0	1
174	400101972	3	9	1	0.080634	-0.06516	2.484907	13.77472	0	0	1	-25	-0.13828	-0.21574	-2.34818	0	1
175	400102020	2	2	1	0.00954	0.319798	2.484907	10.34728	0	1	0	-55	-0.0723	0.000803	-40.2995	0	0
176	400102091	2	1	1	0.05428	-0.20871	3.295837	11.7566	0	1	0	-50	0.076145	-0.15358	5.209663	1	0
177	400403042	3	2	1	0.116702	0.498613	2.890372	11.17038	0	0	0	-60	0.631272	-0.44712	-41.9097	0	0
178	500255655	2	4	1	-0.02981	-0.41838	3.433987	9.429556	0	1	0	-78	-0.98817	-0.2263	-39.7618	0	0
179	500441122	2	4	1	0.064726	0.660205	2.772589	10.48397	0	1	0	-67.5	0.264954	-0.08668	14.15696	0	0

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
180	800001612	2	1	1	0.028494	-0.1002	2.397895	12.8562	0	1	1	-81	-0.8734	-0.1051	-11.6179	1	0
181	1000214853	3	9	1	0.044503	0.279822	4.077537	12.25617	0	0	0	-24	0.003979	0.001681	-11.1702	0	1
182	1000219925	3	9	1	0.052282	1.007391	2.833213	10.71883	0	0	0	-100	-0.06254	0.289506	6.652451	0	1
183	1100101500	3	8	1	0.032319	0.171906	2.772589	12.40981	0	0	1	-28.75	0.26517	-0.15282	-9.48307	0	1
184	1100111516	2	8	1	0.038366	-0.53343	2.302585	9.648337	0	1	0	-49	-0.25881	-0.147	3.726238	0	1
185	1200100557	3	1	1	0.072516	0.00911	2.639057	11.28453	0	0	1	-41.61	0.061544	0.016842	-1.15556	1	0
186	1300113091	3	9	1	-0.03385	-0.37219	2.564949	10.84757	0	0	1	-32.5	-0.23477	-0.17979	3.092186	0	1
187	1400384433	2	1	1	-0.01131	0.328467	2.890372	12.61604	0	1	1	-55	0.621495	-0.46685	-5.84537	1	0
188	1600111049	2	2	1	0.066018	0.312017	3.295837	11.01474	0	1	1	-53	0.052615	0.070778	0.288015	0	0
189	1600194461	3	5	1	-0.25619	-4.71691	3.178054	13.71854	0	0	1	-15	-0.51836	1.895461	-0.07997	0	0
190	1600230014	2	3	1	0.020318	-0.92714	3.295837	11.24569	0	1	0	-51	-0.4819	-0.17876	26.32531	0	0
191	1600230737	3	2	1	0.085315	-4.60238	2.484907	12.43483	0	0	1	-71.83	-0.10891	0.01257	-2.6967	0	0
192	1700456375	2	9	1	-0.02844	0.341423	2.70805	10.95154	0	1	0	-61.75	0.317048	-0.04249	5.663793	0	1
193	1800155452	2	2	1	0.224314	0.12539	2.484907	12.07617	0	1	1	-88	-0.52295	-0.45168	45.28134	0	0
194	1800155519	3	3	1	-0.08978	-0.02633	2.484907	12.6658	0	0	0	-32	-0.23402	0.686812	36.66659	0	0
195	1800155660	2	1	1	0.083285	0.138582	2.564949	9.955273	0	1	0	-50.75	0.003306	-0.03868	-2.86856	1	0
196	1801116600	3	9	1	-0.06823	-0.09283	2.302585	12.30844	0	0	0	-43.5	0.185616	0.315996	-45.9772	0	1
197	1900130638	2	1	1	-0.00058	0.320572	3.091042	11.52323	0	1	0	-63.5	-0.04308	-0.21591	-42.0505	1	0
198	1900176047	2	8	1	-0.02044	-0.69379	2.302585	9.453365	0	1	0	-61.75	-0.28621	0.199054	61.07716	0	1
199	1900234348	2	1	1	0.023174	0.274	2.564949	10.51285	0	1	0	-68.75	0.121555	-0.2802	-89.9353	1	0
200	2000110221	3	2	1	0.032472	-2.57477	2.484907	12.32235	0	0	1	-65.75	0.219085	0.124705	-6.27491	0	0
201	2000266469	2	4	1	0.152608	0.649885	2.995732	11.5269	0	1	0	-79	0.04571	-1.2177	29.8605	0	0
202	2100266310	2	1	1	0.065969	0.877889	2.639057	11.09968	0	1	0	-51.75	0.343907	-0.13921	-44.4042	1	0
203	2300105582	3	4	1	0.072262	-1.24164	2.302585	10.1685	0	0	0	-75.5	-1.55414	-0.25028	37.42716	0	0
204	2500144719	3	6	1	0.00502	0.082956	2.995732	12.24396	0	0	1	-3.59	0.087011	-0.09879	-11.7279	0	1
205	2600107284	2	3	1	0.026983	0.006038	4.060443	13.41738	0	1	1	-71	-0.16167	-0.05663	-28.0295	0	0

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
206	2600107485	2	1	1	-0.00893	0.349447	2.564949	12.15089	0	1	0	-37.5	-0.56873	0.163192	-2.49071	1	0
207	2600111964	1	1	1	-0.0265	-0.29318	2.564949	7.62657	1	0	0	-100	-0.80566	0.210151	75.10608	1	0
208	2600163592	3	1	1	-0.01419	-2.74586	2.564949	8.482395	0	0	0	-74.5	-0.4327	-0.20641	-61.9302	1	0
209	2600164067	3	1	1	0.002354	-2.75402	2.564949	9.802174	0	0	0	-60	-0.78368	-0.09384	-8.39731	1	0
210	2700200047	1	1	1	0.029245	0.657416	2.564949	8.741935	1	0	0	-60	-0.42966	-0.09262	27.08843	1	0
211	2700224457	2	1	1	0.03268	0.190922	2.564949	12.04236	0	1	0	-66	-0.15854	-0.04615	-15.9681	1	0
212	2700263181	2	1	1	-0.00599	0.009753	2.639057	10.25625	0	1	0	-74	0.581461	0.013381	68.3543	1	0
213	2800113535	3	1	1	-0.04665	-1.25377	2.564949	11.27609	0	0	0	-100	-0.4884	0.073007	-50.5445	1	0
214	2800240188	3	2	1	0.012773	-0.60437	2.564949	8.874308	0	0	0	-64	0.183159	0.066661	0.006831	0	0
215	2800486946	2	5	1	0.099816	0.641162	2.564949	9.849559	0	1	0	-91	0.00158	1.553889	-0.02875	0	0
216	2900324272	2	1	1	0.049346	0.273911	2.639057	12.53828	0	1	0	-61	-0.63155	-0.16939	2.40976	1	0
217	2900324360	2	8	1	-0.0017	0.117853	3.044522	10.60587	0	1	0	-88.25	-0.2584	0.071548	-20.3891	0	1
218	2900325068	3	9	1	0.059337	0.129266	2.302585	12.48132	0	0	1	-49	-0.09927	-0.02734	-12.9421	0	1
219	2900326343	3	1	1	-0.00075	-0.55329	2.564949	10.82331	0	0	0	-51	-0.67634	0.151977	17.68896	1	0
220	3000103307	2	8	1	-0.01434	0.017252	3.332205	10.68563	0	1	0	-97.5	-0.21727	0.169016	-54.0853	0	1
221	3000108087	2	5	1	0.006401	0.033809	2.302585	12.00216	0	1	0	-70	-0.15154	0.274191	0.203611	0	0
222	3000167082	1	1	1	0.017189	0.007072	2.564949	10.51875	1	0	0	-82	-0.52287	0.100429	-23.1352	1	0
223	3000310977	1	8	1	-0.01033	-0.25254	2.833213	14.17129	1	0	1	-2.63	-0.55707	-0.02573	-5.8672	0	1
224	3000336559	3	9	1	-0.00711	-0.27779	2.197225	12.30527	0	0	1	-6.16	0.32132	-0.4625	-52.1577	0	1
225	3100110114	2	8	1	-0.00324	0.078153	4.043051	10.98009	0	1	0	-95	-0.40269	0.040814	7.049292	0	1
226	3100126555	2	3	1	0.030702	0.28832	2.397895	11.52862	0	1	0	-80	-0.28468	0.083027	48.71714	0	0
227	3100130287	3	9	1	0.015131	0.104523	2.639057	12.24309	0	0	1	-11.485	0.165392	-0.06025	-4.86134	0	1
228	3100279784	2	1	1	0.016236	0.042196	2.890372	12.81534	0	1	0	-52	-0.66896	-0.10201	-45.6363	1	0
229	3200040693	2	1	1	0.088714	-0.1526	2.564949	10.45565	0	1	0	-57.5	-0.15193	-0.11189	-25.9376	1	0
230	3200139131	2	1	1	-0.00182	0.37425	2.639057	13.09066	0	1	0	-58.75	-1.64274	-0.1029	16.1798	1	0
231	3300101011	2	1	1	0.02161	0.187856	3.295837	11.56666	0	1	1	-92.75	-0.2305	0.036868	8.117967	1	0

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
232	3300101300	3	1	1	-0.06443	-2.70875	2.639057	11.81433	0	0	1	-47.25	-0.57561	0.169252	-29.2413	1	0
233	3300515171	3	9	1	0.033947	0.024386	2.484907	12.58828	0	0	1	-5.82	0.08421	-0.00741	-5.56947	0	1
234	3400172739	2	1	1	0.045683	1.708139	2.639057	9.310095	0	1	0	-82.5	0.080043	-0.05018	-12.4131	1	0
235	3500100424	1	1	1	-0.08024	-0.20929	2.564949	12.49331	1	0	1	-49	-0.08791	-0.00762	-71.1607	1	0
236	3500101932	3	5	1	-0.00155	-0.01902	2.302585	13.29639	0	0	0	-73	-0.96141	0.040701	0.081998	0	0
237	3500102608	3	7	1	0.028347	-0.13362	3.295837	12.50439	0	0	0	-80.25	-0.30172	0.123543	-25.9757	0	1
238	3500103312	3	5	1	-0.023	-1.48217	2.197225	12.1825	0	0	0	-82.25	-0.73956	0.537839	1.210677	0	0
239	3600259296	3	9	1	-0.00383	0.05083	3.367296	14.90688	0	0	1	-36.505	0.156015	-0.20977	2.026946	0	1
240	3600260196	2	3	1	-0.02382	-0.25623	2.639057	14.72258	0	1	0	-67.75	0.075054	0.035149	65.37458	0	0
241	3600301244	3	3	1	0.08689	0.279659	3.135494	11.06222	0	0	0	-63	-0.08393	-0.30239	-64.3998	0	0
242	3900242776	1	1	1	0.054712	-0.03122	2.564949	13.65935	1	0	1	-30.25	0.05288	0.016908	-19.413	1	0
243	3900243956	2	1	1	0.008895	0.278951	2.564949	10.77729	0	1	0	-49.75	0.365441	0.04068	-35.9696	1	0
244	3900244205	3	9	1	0.071317	0.400183	2.397895	10.90254	0	0	0	-50	0.493087	-0.029	-71.5752	0	1
245	4000101277	2	2	1	0.096242	0.579564	2.564949	9.117786	0	1	0	-79	0.106768	-0.0173	13.54047	1	0
246	4000102231	3	8	1	-0.00768	0.091703	2.302585	10.2486	0	0	0	-49	0.335717	-0.03264	-18.6497	0	1
247	4000390371	3	5	1	0.081303	1.358873	2.302585	8.222285	0	0	0	-43.75	-1.67535	3.245296	2.27211	0	0
248	4100258793	3	8	1	0.066658	-0.37142	2.302585	13.05831	0	0	0	-86	-0.06503	-0.11554	-2.94131	0	1
249	4100258955	3	9	1	-0.02276	0.137301	2.197225	13.79501	0	0	1	-42.33	0.220991	-0.10774	13.88157	0	1
250	4100258987	2	8	1	0.003058	0.07328	2.197225	12.83283	0	1	1	-35.035	-0.54792	-0.04971	28.59649	0	1
251	4100259388	2	1	1	0.107333	0.568078	2.564949	10.5925	0	1	0	-70	-0.33091	-0.19564	-7.58622	1	0
252	4100259437	3	2	1	0.021368	-0.27189	2.484907	9.831508	0	0	1	-60	-0.15806	-0.20406	-7.32598	1	0
253	4100259564	3	8	1	0.081737	-0.42686	2.197225	13.57781	0	0	1	-65.915	0.487146	-0.17811	-0.46188	0	1
254	4100298718	3	9	1	0.009232	-0.08111	3.044522	11.78057	0	0	0	-36.25	0.096909	0.089648	-4.29766	0	1
255	4100455008	3	9	1	0.025064	0.328631	2.70805	7.924434	0	0	0	-16	-0.09237	0.49386	-4.31277	0	1
256	4100494751	3	9	1	-0.01976	1.208712	2.70805	9.257415	0	0	0	-31	0.590199	0.437402	-49.6582	0	1
257	4100537606	3	8	1	-0.03338	0.000388	2.70805	9.069928	0	0	0	-35	0.040822	0.141414	-4.17812	0	1

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
258	4100588449	2	8	1	-0.02109	-0.20489	2.564949	8.822175	0	1	0	-89.5	-0.08244	-0.06418	20.25563	0	1
259	4200236666	3	3	1	-0.15013	-1.07987	3.663562	9.565284	0	0	0	-50.5	0.180537	-1.37477	63.98134	0	0
260	4200237853	2	1	1	0.04609	0.044988	2.564949	10.68391	0	1	0	-60	-0.48402	-0.00578	-30.3593	1	0
261	4200238007	3	8	1	-0.0035	0.089408	2.772589	13.11731	0	0	1	-21	0.043621	0.008626	1.804048	0	1
262	4200238776	3	9	1	-0.01996	-0.15731	2.302585	12.47814	0	0	1	-37.2375	-0.89362	-0.02124	-18.7164	0	1
263	4200444916	3	9	1	0.044272	0.669929	2.197225	11.34387	0	0	1	-38.26	0.298806	0.157716	-6.67833	0	1
264	4200497234	3	1	1	0.0173	0.156197	2.833213	9.267665	0	0	0	-48	-0.90016	-0.31471	67.40841	1	0
265	4300204065	3	1	1	0.063212	1.224221	2.639057	10.21698	0	0	0	-80	0.543727	-0.04621	3.468755	1	0
266	4300274030	2	1	1	0.011429	0.527416	2.564949	9.808187	0	1	0	-60.25	-0.22811	0.320148	6.160866	1	0
267	4400114094	2	4	1	0.006203	3.323701	2.302585	13.05674	0	1	1	-33	-1.29047	-0.14887	0.861734	0	0
268	4400115884	3	8	1	0.056785	0.116451	2.564949	11.15479	0	0	1	-8.71	-0.11385	-0.12417	-19.3989	0	1
269	4400116704	3	1	1	0.04454	-0.37193	2.639057	12.47833	0	0	1	-73	1.187414	-0.21235	14.94504	1	0
270	4400118162	2	8	1	0.001329	-0.07536	3.526361	10.77407	0	1	0	-92	-0.56738	0.039199	16.10694	0	1
271	4600100003	2	9	1	0.20591	0.324441	3.258097	13.06403	0	1	1	-49	-0.29479	-0.1549	24.44249	0	1
272	4600123233	3	4	1	0.105121	0.525005	3.135494	10.79747	0	0	0	-70	0.041528	0.211357	-3.99405	0	0
273	4700113373	2	1	1	0.00383	0.152512	2.639057	9.806095	0	1	0	-49	-0.04269	0.370891	1.428764	1	0
274	4800109719	3	1	1	0.01058	-0.06288	3.295837	7.563201	0	0	0	-52.5	-0.86681	0.176618	-16.148	1	0
275	4900222972	3	3	1	0.048707	0.167954	2.833213	9.235228	0	0	1	-26.67	-0.36772	-0.10685	68.02468	0	0
276	5100101071	2	1	1	0.017072	-0.04834	2.564949	10.5132	0	1	0	-100	-0.52295	-0.18314	42.07145	1	0
277	5100102011	3	1	1	-0.00356	-0.69773	3.295837	9.525443	0	0	0	-57	-0.48019	0.170439	-1.04819	1	0
278	5300104295	3	1	1	0.020066	-0.20659	3.295837	9.182147	0	0	0	-63.25	-0.51988	-0.18225	-22.1158	1	0
279	5500154279	2	1	1	0.032448	0.118616	3.332205	10.16777	0	1	0	-100	-0.98363	-0.27607	-28.0932	1	0
280	5600101231	3	3	1	-0.001	-0.64045	2.397895	8.899594	0	0	0	-87	0.017094	-0.01347	18.20297	0	0
281	5700100231	3	9	1	0.084352	0.45008	2.484907	13.25293	0	0	0	-49		0.224244	16.22334	0	1
282	5700101147	2	1	1	0.073125	0.700525	2.639057	13.09855	0	1	1	-60	0.326698	-0.24023	-22.6416	1	0
283	5700101323	1	1	1	0.080104	1.022984	2.564949	13.25238	1	0	1	-42.25	-0.1064	-0.10691	-38.2394	1	0

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
284	5700101637	1	2	1	-0.00725	-0.93305	2.484907	12.82159	1	0	1	-25.79	0.196909	0.079463	-8.15903	1	0
285	5800225019	2	8	1	0.00041	0.10411	3.044522	11.32637	0	1	0	-76	-0.24382	0.094993	-1.78807	0	1
286	5800238473	2	8	1	-0.01292	0.182049	3.044522	9.49409	0	1	0	-29	0.146093	-0.10594	5.751	0	1
287	5900180876	2	8	1	0.016581	0.045634	3.044522	11.0108	0	1	0	-85	-0.19728	0.143597	53.66888	0	1
288	5900181171	2	1	1	0.052294	1.785761	2.564949	9.700085	0	1	0	-64	-1.03247	0.045416	-11.7773	1	0
289	5900189325	2	2	1	0.013355	-0.20175	2.484907	13.17124	0	1	1	-37	-0.51871	-0.11483	-84.2998	0	0
290	5900189607	2	1	1	-0.00475	1.134318	2.564949	8.066208	0	1	0	-60	0.393803	0.348992	51.49896	1	0
291	5900292410	3	2	1	0.241453	3.999166	2.564949	8.861634	0	0	0	-52.75	0.090151	0.074529	-29.9698	1	0
292	6000176300	2	1	1	0.149482	1.042761	3.295837	9.05614	0	1	0	-75	-0.10536	-0.39134	-34.0664	1	0
293	6000234922	2	1	1	0.066756	0.537983	2.564949	10.34798	0	1	1	-65	-0.25131	-0.14273	5.533732	1	0
294	6000235066	2	8	1	-0.0002	-0.37393	2.302585	12.37536	0	1	0	-65	-0.92854	-0.00494	9.779394	0	1
295	6000235274	2	8	1	-0.07274	-0.43899	2.302585	13.18282	0	1	0	-60	-1.09285	0.045544	35.11251	0	1
296	200113804	3	1	0	-0.03189	-1.67585	2.302585	12.47851									
297	200158403	2	1	0	-0.06343	-0.43669	2.484907	11.83574									
298	200158890	2	1	0	-0.01564	-0.15547	2.484907	11.61729									
299	200168673	2	1	0	-0.01055	-0.03244	2.484907	11.69471									
300	200169116	3	1	0	-0.014	-0.25185	3.526361	11.24974									
301	200457474	3	1	0	0.048348	-0.80959	2.890372	11.20328									
302	300464813	2	1	0	-0.08019	-1.13231	3.135494	10.37758									
303	300479714	3	1	0	-0.00726	-0.04628	3.806662	13.83975									
304	300484873	3	1	0	-0.05584	-0.19295	3.496508	12.13424									
305	300514849	3	1	0	-0.08361	-0.0241	2.564949	14.32967									
306	300517173	2	1	0	-0.04567	0.165949	3.258097	10.99237									
307	300518459	2	1	0	-0.00785	-0.18001	3.258097	14.08252									
308	300562514	3	1	0	-0.01455	-2.89228	2.833213	9.845647									
309	300607067	2	1	0	0.00603	-0.62514	3.178054	11.7688									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
310	300632232	2	1	0	-0.01559	-0.12138	2.484907	12.54857									
311	301120371	3	1	0	0.137367	1.310369	3.433987	13.56444									
312	301129367	2	1	0	-0.00188	-0.04005	2.70805	15.57872									
313	301151147	2	1	0	0.043939	-0.18944	3.663562	13.83701									
314	301185717	2	1	0	0.038247	0.064943	3.332205	12.17179									
315	301465129	2	1	0	-0.00306	-0.1759	2.639057	10.05647									
316	302293747	2	1	0	0.012142	-0.07005	2.944439	13.98462									
317	400100827	2	1	0	-0.01747	-2.93333	3.091042	12.62858									
318	400101933	2	1	0	-0.01028	-0.14262	3.295837	11.82435									
319	400102006	2	1	0	-0.11622	-0.09549	3.218876	10.94634									
320	400228295	1	1	0	0.001544	0.006657	2.70805	12.05603									
321	400259705	2	1	0	0.00124	0.054029	3.044522	12.29696									
322	600000185	1	1	0	0.000681	0.028209	3.295837	12.7002									
323	600016097	2	1	0	0.018097	0.251275	3.295837	11.55573									
324	600019436	2	1	0	0.018006	0.234416	2.639057	13.03877									
325	700101130	2	1	0	-0.01309	-0.06728	3.178054	11.56094									
326	700101892	2	1	0	0.001293	-0.01095	2.639057	10.39412									
327	1400294469	3	1	0	0.155093	3.236617	2.484907	10.01481									
328	1500171478	2	1	0	0.016993	0.857571	2.484907	11.02336									
329	1600125108	3	1	0	-0.0144	-0.12454	3.433987	10.46539									
330	1700354084	2	1	0	0.007318	-0.01421	3.258097	10.19032									
331	1800155004	1	1	0	0.072118	0.940541	2.302585	11.20941									
332	1800155188	2	1	0	0.030315	-1.10078	2.302585	11.23077									
333	1800155283	2	1	0	0.013315	0.430108	2.484907	10.32614									
334	1800189564	2	1	0	-0.01759	0.210941	3.7612	10.45631									
335	1800223649	3	1	0	-0.08061	0.213832	3.295837	9.618203									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
336	1900130532	3	1	0	-0.01142	-0.77912	3.135494	9.964724									
337	2500114672	1	1	0	0.0109	-0.33782	3.295837	9.292105									
338	2500171399	2	1	0	-0.0017	-0.19137	3.044522	9.530756									
339	2600108471	2	1	0	0.013357	0.073741	4.060443	13.71384									
340	2600109073	2	1	0	0.000113	0.128912	3.044522	12.59946									
341	2600117081	2	1	0	0.018529	0.081782	2.639057	12.51321									
342	2800100430	1	1	0	-0.00078	0.469197	3.135494	10.33055									
343	2800190120	2	1	0	0.006739	1.319263	2.484907	9.922947									
344	2800190392	2	1	0	0.000938	0.191119	2.833213	12.14622									
345	2800230817	2	1	0	-0.12264	-2.21536	2.397895	9.324829									
346	2900324628	1	1	0	-0.00344	0.797195	2.197225	8.70996									
347	2900324850	2	1	0	-0.00314	-0.19305	3.332205	13.73328									
348	2900324868	2	1	0	0.00468	0.00412	2.397895	11.90924									
349	2900325942	1	1	0	0.020579	0.57255	2.890372	11.66844									
350	2900326784	2	1	0	0.051607	-0.2924	2.397895	7.323171									
351	2900326985	2	1	0	-0.00836	0.198683	3.295837	9.469083									
352	3000101973	2	1	0	0.009017	0.124597	2.302585	11.15184									
353	3000109210	3	1	0	0.022446	-0.05767	3.295837	10.72514									
354	3000164878	1	1	0	0.017021	0.13893	2.302585	12.03077									
355	3100114493	1	1	0	0.090688	0.777588	2.302585	11.91422									
356	3100114609	1	1	0	0.019574	0.490078	2.302585	11.12916									
357	3100135408	2	1	0	0.048186	-0.96287	2.564949	10.84254									
358	3200094610	1	1	0	-0.03022	0.270396	2.302585	12.20851									
359	3200135169	2	1	0	-0.13972	0.055072	2.484907	8.996404									
360	3400164953	2	1	0	0.006512	0.258652	3.258097	12.07595									
361	3400178522	1	1	0	0.053346	0.289434	3.295837	12.16407									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
362	3500100992	2	1	0	-0.01564	0.069199	3.295837	9.181015									
363	3500101386	2	1	0	-0.01187	-0.06599	2.484907	12.75893									
364	3500101717	2	1	0	-0.02661	-2.9999	2.397895	11.68011									
365	3500101812	3	1	0	0.04368	0.08341	2.564949	12.58742									
366	3500101844	3	1	0	0.009682	0.467666	2.944439	12.52629									
367	3500122026	3	1	0	0.000982	0.075147	2.484907	12.00422									
368	3500402217	3	1	0	0.022801	0.650264	2.944439	8.819665									
369	3600268170	2	1	0	-0.02328	-0.72382	3.401197	12.83006									
370	3600333736	3	1	0	0.089362	1.018495	3.295837	11.68818									
371	3600347538	2	1	0	-0.0697	-0.79178	3.295837	10.08523									
372	3600361772	3	1	0	-0.05396	0.336044	3.044522	9.566965									
373	3600505103	3	1	0	-0.0269	-0.31217	2.890372	8.705331									
374	3800100062	1	1	0	-0.01455	0.162245	3.091042	14.00613									
375	3800100270	1	1	0	-0.02933	0.130373	2.70805	13.40254									
376	3800100464	1	1	0	-0.02427	0.075775	2.890372	12.04096									
377	3800102214	1	1	0	-0.02075	0.152924	2.484907	10.24725									
378	3900242832	1	1	0	0.017162	0.197274	3.178054	13.26202									
379	3900243674	1	1	0	-0.01782	-0.2346	2.564949	11.31455									
380	4000100890	3	1	0	0.045893	0.976797	2.564949	9.595399									
381	4000102591	3	1	0	-0.00208	0.147189	2.890372	8.489205									
382	4000292825	1	1	0	0.026531	-0.02425	3.091042	11.73024									
383	4000346904	3	1	0	0.05214	-0.17884	3.332205	9.626614									
384	4000357776	2	1	0	-0.00159	-1.05866	3.465736	10.10434									
385	4100259282	3	1	0	-0.01869	0.070319	2.484907	9.546598									
386	4100451042	3	1	0	0.008424	0.354054	2.890372	8.701014									
387	4200235327	2	1	0	0.013333	-0.35426	2.944439	10.21024									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
388	4200239561	3	1	0	0.054787	0.020435	2.302585	11.44362									
389	4200340233	2	1	0	0.031585	0.161696	3.044522	11.64906									
390	4300244075	1	1	0	0.006033	0.053695	2.484907	10.75041									
391	4400241342	1	1	0	-0.01529	0.294808	2.302585	10.32039									
392	4500168103	2	1	0	0.035328	0.660782	2.484907	8.858369									
393	4500213606	2	1	0	-0.0503	0.379557	2.890372	12.0721									
394	4600128263	3	1	0	0.032608	3.215007	3.295837	9.45548									
395	4900101047	2	1	0	-0.02581	-0.45434	3.295837	8.102284									
396	4900219747	2	1	0	0.020755	0.467172	2.833213	10.10871									
397	5000120634	2	1	0	0.008994	0.179272	3.295837	8.694									
398	5000121437	2	1	0	-0.01492	0.258934	2.397895	9.868793									
399	5000124639	3	1	0	0.00121	0.278759	2.397895	10.67577									
400	5200117692	3	1	0	-0.0952	-1.39262	3.295837	11.71534									
401	5300100195	2	1	0	-0.01059	0.166196	3.295837	9.441452									
402	5300105098	2	1	0	-0.07645	-0.47302	3.258097	7.879291									
403	5300117858	2	1	0	0.070338	1.772073	3.295837	8.13564									
404	5400102238	2	1	0	-0.00838	-0.42153	3.295837	8.513587									
405	5400104901	2	1	0	0.007645	0.608765	2.397895	10.17786									
406	5400108279	2	1	0	0.002626	0.113324	2.639057	11.47794									
407	5400145898	2	1	0	-0.00169	-0.13615	3.295837	8.987197									
408	5400158110	2	1	0	-0.01797	-0.2708	3.295837	9.36452									
409	5500178015	2	1	0	0.010623	0.357781	3.091042	9.710327									
410	5600100069	3	1	0	-0.01598	-0.61399	3.295837	8.393216									
411	5600101136	2	1	0	-0.00742	0.081367	2.995732	9.911456									
412	5600101143	2	1	0	-0.01641	0.409221	3.135494	10.11634									
413	5600101150	2	1	0	0.000349	0.302052	2.484907	8.964568									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
414	5600101295	2	1	0	0.003353	0.396562	2.397895	9.536041									
415	5600152437	2	1	0	-0.00716	0.188216	2.484907	9.960246									
416	5700100104	2	1	0	-0.00209	0.134254	2.484907	12.99201									
417	5700100425	2	1	0	-0.04194	-0.32955	2.397895	12.83299									
418	5700101901	2	1	0	0.015202	0.65521	2.70805	9.75022									
419	5800000745	2	1	0	-0.01601	0.406418	3.044522	10.11302									
420	5900190514	1	1	0	-0.0619	0.087887	3.295837	10.06199									
421	5900190521	1	1	0	-0.03233	0.117294	3.295837	11.61537									
422	5900227820	2	1	0	0.032642	0.425623	3.367296	12.98042									
423	6000174504	1	1	0	-0.00102	0.164093	2.564949	10.80716									
424	6000174705	1	1	0	-0.00912	-0.58926	3.295837	11.10332									
425	6000174896	1	1	0	-0.00913	0.116835	3.091042	10.89629									
426	6000175307	1	1	0	0.013289	0.011903	2.484907	9.52712									
427	6000175392	1	1	0	-0.00318	0.0598	3.332205	10.35332									
428	6000175515	1	1	0	0.052518	0.480018	3.295837	9.865162									
429	6000175610	1	1	0	0.047201	0.002112	3.295837	10.87398									
430	6000175829	1	1	0	0.014725	0.103243	2.944439	13.35853									
431	6000175995	2	1	0	-0.03236	-0.09454	2.639057	12.25445									
432	6000176903	1	1	0	-0.00757	0.360128	2.484907	12.57756									
433	6000178717	2	1	0	0.012075	-0.00078	2.70805	11.99626									
434	6000180064	1	1	0	0.10609	0.980126	2.302585	9.207536									
435	6000180307	1	1	0	0.111553	1.397377	3.295837	10.16862									
436	6000180402	1	1	0	0.116794	0.728552	3.295837	10.84404									
437	6000180748	1	1	0	0.115723	0.151278	3.295837	10.76124									
438	6000181501	1	1	0	0.059491	0.40506	3.218876	10.59618									
439	6000183273	1	1	0	0.027572	0.49274	3.178054	12.12286									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
440	6000183675	1	1	0	0.052541	0.000561	3.332205	10.23914									
441	6000234721	2	1	0	0.144868	3.945939	3.091042	8.791486									
442	6000234954	2	1	0	-0.00105	-0.22382	3.178054	10.96332									
443	6000235115	3	1	0	0.047437	0.828705	2.302585	8.113127									
444	6000372288	2	1	0	-0.0316	-0.63733	2.944439	9.861728									
445	6100103828	2	1	0	0.027475	-0.08903	3.044522	11.28091									
446	6100104839	1	1	0	0.092499	0.411118	3.295837	13.16395									
447	100101724	2	2	0	-0.068	-1.49022	3.258097	13.53616									
448	100101918	2	2	0	0.615404	-0.35854	3.610918	8.898639									
449	100105863	2	2	0	0.01303	-0.06528	3.433987	12.68194									
450	100106063	2	2	0	0.014712	0.986573	3.295837	13.38014									
451	100106225	2	2	0	-0.00825	-0.03371	2.639057	14.21148									
452	100106391	2	2	0	0.091913	0.563928	3.178054	13.11107									
453	100109794	2	2	0	0.046401	0.543329	3.295837	9.947791									
454	100110366	2	2	0	0.006585	-0.45653	3.465736	11.0655									
455	100110373	2	2	0	-0.0424	-0.54598	2.995732	8.872487									
456	100110454	2	2	0	-0.00664	-0.07869	3.135494	11.28108									
457	100863673	2	2	0	-0.00204	-0.08956	2.995732	11.91393									
458	100863835	2	2	0	0.002346	0.120043	3.044522	8.556414									
459	100977705	2	2	0	0.35045	4.532478	3.135494	14.49294									
460	101049354	2	2	0	0.012006	0.234269	2.995732	11.73947									
461	200153412	2	2	0	-0.08438	-0.22915	2.833213	13.78311									
462	200171644	2	2	0	0.026983	-0.04281	2.484907	10.9697									
463	300380289	2	2	0	-0.0056	-0.55704	3.295837	11.95308									
464	300396948	2	2	0	0.015166	0.084186	3.295837	12.62308									
465	300442707	2	2	0	-0.07064	-0.26493	3.295837	13.70502									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
466	300443073	2	2	0	-0.27337	-0.2258	3.78419	13.0757									
467	300450289	2	2	0	-0.0474	-0.34157	3.178054	13.44178									
468	300600417	2	2	0	-0.039	-0.32679	2.70805	11.91884									
469	300649250	2	2	0	-0.00896	-0.07406	3.091042	12.84497									
470	301447761	2	2	0	-0.05613	-0.00371	3.091042	11.39463									
471	301447810	2	2	0	-0.17958	-4.38992	3.091042	11.15273									
472	301460177	2	2	0	0.054807	0.188198	3.295837	10.77835									
473	301469532	2	2	0	-0.00951	-0.47779	3.295837	10.65601									
474	301481314	2	2	0	0.004313	0.035395	3.091042	13.65958									
475	400101203	2	2	0	0.00368	0.060379	3.091042	12.60013									
476	1200100701	2	2	0	0.003468	0.553627	2.484907	11.12779									
477	1200417554	2	2	0	-0.01046	0.516493	2.995732	9.204825									
478	1300100790	2	2	0	0.003438	0.032095	2.564949	12.45229									
479	1500172827	2	2	0	0.034169	0.405591	2.397895	8.593599									
480	2000103383	2	2	0	-0.00912	-0.302	2.397895	12.47944									
481	2100234397	2	2	0	0.1035	0.500938	2.564949	9.176473									
482	2500155809	2	2	0	0.005873	0.073298	3.044522	10.40159									
483	2800228046	2	2	0	-0.20472	-0.11357	3.295837	11.47037									
484	2800463787	2	2	0	0.00104	0.231651	3.091042	9.990399									
485	3300100385	2	2	0	0.016459	0.013486	3.295837	10.80619									
486	3700145020	2	2	0	0.035615	-0.07665	3.332205	15.62165									
487	3700146225	2	2	0	0.113174	0.084401	3.295837	11.60877									
488	3700146539	2	2	0	-0.18137	-0.22885	3.295837	11.24764									
489	4100259155	2	2	0	0.098478	1.611072	3.258097	10.71366									
490	4100298570	2	2	0	0.061858	0.034289	3.044522	11.27666									
491	4400115690	2	2	0	-0.00105	-0.005	2.639057	11.49452									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
492	5000127213	2	2	0	0.038807	0.052533	3.135494	11.70072									
493	5200129313	2	2	0	0.013346	0.375904	3.091042	10.36186									
494	100102051	3	2	0	-0.03575	-1.35845	3.295837	9.06242									
495	100102206	3	2	0	0.050894	-0.08344	3.583519	14.29878									
496	100102414	3	2	0	0.025409	-0.40569	3.912023	12.51135									
497	100102608	3	2	0	-0.0023	-0.00851	2.639057	15.42765									
498	100106680	3	2	0	-9.70E-05	-0.19741	3.091042	10.87988									
499	100106835	3	2	0	-0.04152	-2.76009	3.218876	10.73507									
500	100107067	3	2	0	0.164935	-0.70324	3.135494	11.27492									
501	100107229	3	2	0	0.00276	-0.62125	2.484907	10.83204									
502	100107317	3	2	0	0.041932	0.157919	3.295837	12.11604									
503	100107620	3	2	0	-0.0038	0.629374	3.218876	10.52318									
504	100107814	3	2	0	-0.01831	0.025837	3.135494	9.770585									
505	100109716	3	2	0	-0.01689	0.156676	3.295837	9.480825									
506	100109836	3	2	0	-0.00237	-0.26506	3.135494	9.849348									
507	100109882	3	2	0	0.019217	-0.93615	3.295837	10.36804									
508	100109924	3	2	0	-0.00522	-0.04272	3.367296	9.739261									
509	100110091	3	2	0	0.011861	0.107789	3.091042	11.21022									
510	100110133	3	2	0	-0.00789	-0.60136	3.044522	9.831938									
511	100110221	3	2	0	0.017809	-0.18344	3.044522	10.28182									
512	100110285	3	2	0	0.011939	-0.0905	3.73767	11.41852									
513	100110380	3	2	0	0.007295	-0.01573	3.401197	10.97483									
514	100110729	3	2	0	-0.02249	0.261511	3.688879	9.351406									
515	100110743	3	2	0	-0.09895	0.127074	3.044522	9.171184									
516	100110817	3	2	0	-0.0041	0.073387	4.060443	11.26696									
517	100110824	3	2	0	0.011956	0.483701	3.135494	9.18122									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
518	100110831	3	2	0	0.043116	-1.77929	3.178054	10.98353									
519	100110937	3	2	0	0.020353	0.364812	3.401197	10.13607									
520	101058743	3	2	0	0.00189	0.327098	2.944439	10.97922									
521	101070162	3	2	0	0.015321	0.756288	2.944439	8.660254									
522	101074336	3	2	0	0.027893	0.535251	2.944439	9.469083									
523	101078450	3	2	0	0.02277	0.118642	2.944439	13.69729									
524	101098048	3	2	0	0.006405	0.087113	2.944439	12.01798									
525	101138244	3	2	0	0.002696	0.188612	2.944439	9.878272									
526	101148154	3	2	0	0.012471	0.452548	2.944439	14.16697									
527	101150107	3	2	0	0.008254	0.043396	2.944439	15.78041									
528	101248046	3	2	0	-0.00378	0.090248	2.890372	14.6881									
529	101264506	3	2	0	-0.00384	-0.72659	2.944439	10.96766									
530	101335193	3	2	0	0.040789	0.107048	2.833213	11.79609									
531	3500102710	2	3	0	-0.14788	0.179021	2.564949	16.61941									
532	301429113	2	3	0	-0.01544	-0.37451	2.302585	15.03972									
533	100104411	2	3	0	-0.02681	0.356184	3.295837	11.82232									
534	100104718	2	3	0	-0.00551	0.221324	3.091042	10.84959									
535	100104813	2	3	0	0.008063	0.802975	2.302585	11.12745									
536	100107282	3	3	0	0.08388	-0.61066	3.295837	10.02185									
537	4200285254	3	3	0	0.006313	0.071007	2.302585	13.28298									
538	100110020	3	3	0	-0.01494	0.020641	3.295837	10.41915									
539	300582655	3	3	0	-0.08582	0.05538	3.178054	14.95334									
540	100780297	3	3	0	0.026665	0.041217	3.044522	13.80763									
541	2900511554	2	4	0	0.007594	0.065421	2.995732	9.335121									
542	301483953	3	4	0	-0.02808	0.393528	3.044522	7.994295									
543	300540207	3	4	0	-0.03601	-0.11009	3.713572	12.40435									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
544	301339815	3	4	0	-0.01211	0.207313	3.332205	12.26498									
545	300469106	3	4	0	-0.67775	-0.86157	3.295837	12.65663									
546	5300103492	3	4	0	-0.01076	-1.05349	3.091042	10.3313									
547	300465937	3	4	0	-0.01084	2.790299	3.178054	12.39014									
548	300426575	3	4	0	-0.00228	0.850346	3.7612	12.23448									
549	300691622	3	4	0	-0.01017	-0.18832	3.091042	14.58263									
550	301259038	3	4	0	-0.18528	-1.04953	3.091042	10.00311									
551	301399684	3	4	0	-0.005	0.629232	3.091042	10.52718									
552	301431835	3	4	0	-0.00233	0.076439	3.091042	14.23491									
553	301447419	3	4	0	-0.01349	0.159838	3.091042	10.14549									
554	300426374	3	4	0	-0.00041	0.092321	3.806662	13.33628									
555	600001206	3	4	0	-0.00576	-1.64013	3.295837	10.17645									
556	1600190393	3	4	0	-0.07308	0.051852	3.295837	13.50607									
557	1800545163	3	4	0	-0.02684	1.103571	2.772589	12.44366									
558	1900135322	3	4	0	-0.0653	-0.33699	3.044522	13.04505									
559	2000266927	3	4	0	-0.06322	-0.29282	2.397895	12.56451									
560	2100114477	3	4	0	-0.03945	-0.05716	2.397895	12.73613									
561	2400112625	3	4	0	-0.00984	-0.51921	3.135494	9.413118									
562	3200040936	3	4	0	-0.02304	2.119235	2.302585	9.085797									
563	3400176331	3	4	0	-0.14582	-1.55821	2.397895	12.10708									
564	4200241546	3	4	0	-0.09329	0.348795	2.302585	11.60148									
565	3100113556	2	5	0	-0.00047	0.348705	2.302585	11.85241									
566	4700143730	2	5	0	-0.00861	0.994713	2.302585	10.99412									
567	5300123227	2	5	0	-0.22268	6.131196	3.295837	9.98562									
568	300491126	2	5	0	-0.10753	1.940009	2.397895	11.54509									
569	200534908	2	5	0	-0.00935	0.457631	2.944439	10.54006									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
570	300482393	2	5	0	0.041998	2.640077	3.367296	12.40557									
571	100107927	3	5	0	0.097025	-1.57666	3.332205	12.39161									
572	1000215007	3	5	0	0.240336	4.841799	3.295837	10.57403									
573	101878104	3	5	0	0.032939	0.796506	2.833213	7.049255									
574	5400232893	3	5	0	0.006965	2.140971	2.70805	9.680781									
575	100104267	3	6	0	-0.03246	0.333345	3.091042	13.11374									
576	5700521751	3	6	0	-0.01579	-0.41468	2.70805	10.47613									
577	100101273	3	6	0	-0.00543	-1.42177	3.295837	11.59455									
578	5700476386	3	6	0	-0.02645	-0.7387	2.772589	11.18285									
579	100101509	3	6	0	0.139914	3.428365	2.397895	11.3855									
580	100114314	3	6	0	-0.04286	0.457639	3.178054	13.20521									
581	200149102	3	7	0	-0.03516	0.288454	2.302585	10.74564									
582	1600110119	3	7	0	-0.00965	-0.11375	3.135494	12.93193									
583	3100131530	3	7	0	0.013427	-0.02097	3.091042	9.162934									
584	3200266161	3	7	0	0.011331	0.146334	2.564949	10.14714									
585	304414108	3	7	0	0.001745	0.028023	2.639057	12.94388									
586	5400164040	1	8	0	0.054092	-2.06975	3.295837	8.214276									
587	5500155096	1	8	0	7.46E-05	1.054108	2.197225	10.03395									
588	301433085	1	8	0	-0.03455	-0.2878	2.70805	11.57855									
589	2800104629	1	8	0	0.645764	-0.5711	3.295837	10.38893									
590	2800104770	1	8	0	0.005835	0.390061	3.295837	9.915416									
591	3600268389	1	8	0	-0.01946	-0.62687	3.295837	10.24189									
592	4300354021	1	8	0	0.029203	0.382431	3.258097	8.360539									
593	5100306079	2	8	0	0.014708	0.318862	2.397895	10.77246									
594	3500614211	2	8	0	-0.01581	-0.16144	2.484907	13.94541									
595	3600274914	2	8	0	-0.01699	-0.24429	3.218876	12.93663									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
596	200534915	2	8	0	0.042376	2.409275	2.302585	8.718991									
597	301434177	2	8	0	-0.00225	-0.0657	3.091042	12.29587									
598	301455353	2	8	0	0.004007	-0.05	3.367296	11.46949									
599	301482692	2	8	0	0.030505	-0.10871	3.044522	11.76249									
600	301897104	2	8	0	-0.05718	-0.9236	2.995732	10.68258									
601	303218213	2	8	0	0.006227	0.535867	2.772589	11.72909									
602	400228640	2	8	0	-0.01202	-0.14122	3.044522	11.65372									
603	1500169888	2	8	0	0.033695	0.032293	2.302585	10.23168									
604	4800130453	2	8	0	-0.01759	-0.15039	2.639057	10.62328									
605	5300133049	2	8	0	-0.04166	-0.47384	3.044522	11.02324									
606	5500217948	2	8	0	0.001	-0.30194	2.772589	12.55034									
607	5800075878	2	8	0	0.109119	0.672357	3.178054	11.17241									
608	2600430022	2	8	0	0.040325	0.409686	2.484907	10.81816									
609	400513870	2	8	0	-0.02995	-0.43481	2.484907	9.969509									
610	1800278239	2	8	0	0.062899	0.117413	3.044522	10.8143									
611	5300216753	2	8	0	-0.00475	-0.3726	2.302585	11.03772									
612	5600101344	2	8	0	-0.00107	0.110328	3.295837	12.11072									
613	5700471275	2	8	0	-0.02969	0.071991	2.772589	10.50442									
614	5700479757	2	8	0	-0.0128	-0.18787	2.772589	10.4936									
615	304941312	2	8	0	-0.00213	0.021386	2.564949	12.65751									
616	2500172603	2	8	0	0.018191	-1.30879	3.044522	9.549801									
617	500468572	3	8	0	-0.04946	-0.02174	2.70805	10.94854									
618	5800000230	3	8	0	0.030389	-0.35177	2.70805	12.88933									
619	5800000382	3	8	0	-0.00468	-0.36321	3.044522	9.641083									
620	5800001019	3	8	0	-0.0225	-0.273	3.295837	9.864357									
621	5800195011	3	8	0	0.03408	0.060837	2.302585	10.29553									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
622	5900187857	3	8	0	-0.06126	-0.37686	3.295837	9.461908									
623	5900188794	3	8	0	-0.09767	-0.53401	3.295837	9.10864									
624	5900188811	3	8	0	0.106677	-0.27477	3.295837	7.26473									
625	5900190465	3	8	0	-0.06665	-0.4363	3.135494	10.92453									
626	6000147902	3	8	0	0.025249	-0.55997	3.258097	9.616805									
627	6000148286	3	8	0	0.040084	0.096662	3.295837	9.487214									
628	6000173564	3	8	0	-0.04087	-0.24922	3.295837	10.83437									
629	6000173645	3	8	0	-0.0246	-0.44849	3.295837	10.21888									
630	6100105310	3	8	0	-0.01546	-0.06275	3.295837	11.48373									
631	6100105367	3	8	0	-0.12097	-0.44436	2.833213	10.41748									
632	6100138644	3	8	0	0.031239	0.11839	3.135494	10.8492									
633	6100139119	3	8	0	0.041165	-0.14631	3.178054	9.54101									
634	6100146571	3	8	0	0.056962	-0.1927	3.044522	9.851141									
635	6100185820	3	8	0	-0.08339	-1.97646	2.833213	9.413036									
636	6100185838	3	8	0	0.016557	-0.05157	2.833213	10.14365									
637	6100186422	3	8	0	0.02049	0.084081	2.833213	10.05225									
638	6100187306	3	8	0	-0.00364	-0.08143	2.833213	9.222862									
639	6100190394	3	8	0	0.095584	0.743743	2.772589	11.39026									
640	6100205403	3	8	0	0.002992	0.040381	2.70805	13.10281									
641	300555450	3	8	0	0.083062	-3.00085	3.806662	14.54848									
642	303741141	3	8	0	0.064194	0.575122	2.70805	12.1116									
643	100108021	3	8	0	-0.02162	-0.95295	3.218876	11.48515									
644	100234322	3	8	0	-0.00011	-0.10771	2.772589	12.38532									
645	300100037	3	8	0	0.094214	0.122864	2.995732	16.10014									
646	300509782	2	9	0	-0.03638	-0.12574	3.295837	12.66356									
647	3700769438	2	9	0	0.101405	0.57162	2.564949	13.14332									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
648	200128254	2	9	0	0.002005	-1.42988	2.302585	11.98293									
649	3700772409	2	9	0	0.014356	-0.05893	2.564949	11.3537									
650	100107860	2	9	0	0.007222	0.276245	3.295837	12.00041									
651	301073280	2	9	0	-0.00329	0.958938	3.091042	9.931492									
652	300516035	2	9	0	0.001613	0.019601	2.639057	11.73525									
653	301441600	2	9	0	0.086964	0.124645	3.091042	14.32338									
654	303158155	2	9	0	-0.00966	-0.23103	2.772589	13.4503									
655	303982242	2	9	0	-0.11026	0.258453	2.639057	7.950502									
656	5000280116	2	9	0	0.031947	0.278829	2.484907	14.22869									
657	4201202370	2	9	0	-0.06515	1.543425	2.302585	10.65015									
658	1000215423	2	9	0	0.00816	0.032963	3.295837	12.09885									
659	100102083	2	9	0	0.014589	-1.41183	3.295837	12.41446									
660	3600276171	2	9	0	0.094876	1.734573	3.295837	8.310169									
661	400101066	2	9	0	0.043806	0.070365	3.135494	13.33877									
662	500237984	2	9	0	0.011523	-0.01894	3.044522	13.22411									
663	2900619702	2	9	0	-0.04579	-0.08858	2.70805	9.222071									
664	4700127785	2	9	0	0.002921	0.010546	2.564949	11.07122									
665	1800155050	3	9	0	0.193224	-1.35675	3.295837	11.04666									
666	101216069	3	9	0	0.019314	-0.3758	3.218876	15.89521									
667	6400001087	3	9	0	0.346239	-0.17263	2.772589	7.543273									
668	102068173	3	9	0	-0.00133	1.52086	2.564949	9.353054									
669	102226239	3	9	0	0.019857	0.499188	2.564949	11.39474									
670	200120833	3	9	0	0.072283	-5.27271	2.302585	12.69655									
671	3001278620	3	9	0	0.004756	-6.65468	2.302585	12.20728									
672	3001012677	3	9	0	-0.01953	0.138464	2.397895	13.05489									
673	301092597	3	9	0	0.136907	0.341292	3.091042	12.25396									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
674	3000108270	3	9	0	-0.01008	-0.18448	2.302585	9.515248									
675	5300104489	3	9	0	0.145574	0.134768	3.135494	8.807621									
676	5700471268	3	9	0	0.103515	0.173939	2.772589	10.59521									
677	400396966	3	9	0	-0.00199	0.041831	2.890372	10.40883									
678	3500997973	3	9	0	-0.04925	0.038304	2.302585	10.65759									
679	5700100030	3	9	0	0.092083	0.198281	3.091042	10.72289									
680	306386671	3	9	0	-0.14831	-0.04818	2.833213	12.01764									
681	100104443	1	10	0	-0.19632	-0.11238	3.218876	10.44403									
682	100103601	2	10	0	0.028561	0.176655	4.043051	11.205502									
683	101376672	2	10	0	-0.01232	-0.47709	2.890372	15.59491									
684	102314051	2	10	0	0.395854	-0.4193	2.639057	13.20708									
685	100738312	2	10	0	0.038283	-0.47497	2.772589	11.9217064									
686	100106024	2	10	0	-0.07913	-0.39873	3.258097	12.89769									
687	100100576	2	10	0	0.38659	-0.09193	4.304065	12.48099									
688	100100174	2	10	0	-0.00511	0.183024	3.258097	13.66884									
689	100100791	2	10	0	-0.02666	-0.01757	2.833213	11.86399									
690	100105704	2	10	0	-0.06947	-0.40955	3.135494	13.69273									
691	101485294	2	10	0	-0.00256	0.080892	2.833213	11.13779									
692	100102220	2	10	0	-0.32928	-0.29233	3.931826	11.6252									
693	100886857	2	10	0	-0.01593	-0.10745	3.091042	14.36948									
694	4400135552	2	10	0	-0.02358	-0.50234	2.70805	10.651532									
695	100106313	2	10	0	0.002852	0.241055	3.135494	15.657825									
696	800447284	2	10	0	-0.01191	-0.45321	2.564949	11.99311									
697	102773175	3	10	0	-0.00362	0.621478	2.564949	12.50434									
698	100107099	3	10	0	-0.05474	-0.27214	3.218876	13.15595									
699	104068531	3	10	0	0.010728	0.088691	2.484907	13.39537									

STT	TAXid	INDID	EQUIyearid	Ti	dROA	dTAS	LNAGE	LNASSET	IND1	IND2	LIST	dSTATE	dLNEMPL	dLEV	dGROWTH	TAXAD	PHASE
700	100102848	3	10	0	0.052168	-0.0519	3.713572	12.45343									
701	100103866	3	10	0	-0.00494	-0.06702	3.218876	11.03759									
702	101453768	3	10	0	0.010745	-1.27223	4.110874	11.597035									
703	100101379	3	10	0	-0.03652	-0.60797	3.218876	10.641999									
704	100107324	3	10	0	-0.0082	0.350041	3.332205	10.47349									
705	100105486	3	10	0	-0.01622	-0.32669	3.218876	11.4753978									
706	100105528	3	10	0	0.017537	-0.19049	3.218876	11.63959									
707	104831665	3	10	0	-0.00541	0.162146	2.397895	12.79875									
708	100111909	3	10	0	-0.00044	-0.14027	3.332205	8.83061									
709	102112993	3	10	0	0.022439	0.359474	2.639057	10.525148									

Source: Author's data collection from VGSO (2021)

Table 15.2 The short-run nderpricing

STT	MST	Ari (%)	MAARi (%)	IND	FSIZE	CRIS
1	100114145	-9.75921	-8.504075035	1	0	1
2	100106264	-42.4948	-36.47782621	3	1	1
3	2500144719	-117.552	-52.87665042	3	1	1
4	3300101011	-40.482	-20.67286295	2	1	0
5	301042973	14.29935	7.86633169	2	1	0
6	100109561	-112.087	-47.36755208	2	1	0
7	5700101147	169.0421	191.8737679	2	1	0
8	301465263	13.42649	9.662514156	2	1	0
9	4900222972	-95.8111	-32.38927566	3	0	0
10	800001612	63.25435	45.26391417	2	1	0
11	100100456	15.21295	8.84918639	2	1	1
12	100107370	150.8625	86.48211422	3	1	1
13	300523755	-213.047	-91.89238959	2	1	0

14	101003060	-10.2147	-10.59830197	3	1	1
15	400101676	-10.445	-9.631615268	3	1	0
16	3500100424	52.91284	25.6749494	1	1	0
17	100100047	8.587734	7.260180973	3	1	1
18	1600194461	-69.6962	-46.80610678	3	1	1
19	100779365	-24.9257	-13.52380186	2	1	1
20	100100512	73.66196	55.39936611	2	1	1
21	100100696	-31.2129	-20.64166764	2	1	1
22	2600107284	-121.176	-80.15561314	2	1	0
23	4400114094	21.3167	17.23490827	2	1	1
24	101394512	-77.1345	-53.66098295	3	1	1
25	1100101500	-2.93243	-2.449452489	3	1	1
26	302533156	10.58809	9.931493643	2	1	0
27	100931299	-7.74803	-8.63694817	3	1	1
28	3100130287	-28.9829	-22.48778499	3	1	1
29	400101323	18.05542	19.2674854	2	1	0
30	200572501	83.82228	66.43192339	2	1	1
31	4200238007	-41.645	-29.24215738	3	1	1
32	4400115884	-34.1106	-23.50663817	3	1	1
33	300437898	-53.7155	-47.76018751	3	0	0
34	4100259564	204.9198	152.479243	3	1	1
35	4100258987	-3.28917	-3.184740927	2	1	1
36	6000234922	4.781664	5.021788753	2	1	0
37	1400384433	-47.5049	-37.55453471	2	1	0
38	400101901	-53.5659	-51.83334453	3	1	1
39	100104997	-48.4204	-34.23864017	2	1	0
40	3000310977	-31.2553	-26.88508065	1	1	1
41	300448709	-100.271	-68.95753118	3	1	0

42	3300515171	-8.67252	-8.264718049	3	1	1
43	3300101300	-18.3239	-13.12776109	3	1	0
44	5700101323	77.12292	116.4386017	1	1	0
45	200157840	68.97506	36.5202355	2	1	1
46	100104563	34.18961	37.64944827	2	1	0
47	200236845	21.44682	18.79507039	3	1	1
48	300430099	-68.6426	-44.22200121	3	1	1
49	4200238776	33.85975	31.90094915	3	1	1
50	100105493	157.8478	111.0414449	2	1	0
51	100103721	-84.3997	-47.82424026	3	1	1
52	300452060	215.8895	126.7790412	3	1	0
53	100100199	164.5066	118.7829522	3	1	0
54	100110415	-41.9076	-22.56221863	3	1	1
55	4100258955	-8.1682	-7.5541823	3	1	1
56	2900325068	-28.3937	-23.20062325	3	1	1
57	300479760	220.7552	265.1879428	3	1	0
58	1200100557	58.45742	45.38079909	3	1	0
59	301171827	-5.97538	-4.656322072	3	1	1
60	100110302	-62.1936	-34.13597985	3	0	1
61	100107123	-19.8122	-15.76935533	3	1	1
62	100106440	-83.9046	-63.14540964	2	1	1
63	100102446	-117.175	-61.06850419	3	1	1
64	100101555	419.1677	518.5642483	2	1	0
65	104575757	-124.707	-69.90823322	3	1	1
66	104297034	-50.8249	-26.63432987	2	1	1
67	100108173	28.87461	16.97156985	2	1	1
68	100105976	-34.0024	-19.30514591	2	1	1
69	100108007	62.27681	71.6015328	3	1	0

70	1300113091	0.402236	0.403281508	3	1	1
71	4600100003	-2.88994	-2.38928058	2	1	1
72	100100015	-15.1602	-9.557173598	1	1	1
73	100103087	10.76096	9.518881966	3	1	1
74	100106338	-13.4283	-11.41910333	2	1	1
75	100109032	-5.1151	-3.079249378	2	1	1
76	400101972	50.55153	44.89795596	3	1	1
77	100107437	-108.779	-76.10894188	3	1	1
78	300585984	-21.7158	-19.80955323	3	1	1
79	200827051	36.00316	37.68008489	2	1	1
80	3600259296	43.00707	44.78527572	3	1	1
81	300422482	4.238107	4.49435316	2	1	1
82	100100939	-20.496	-18.32849547	2	1	1
83	3000336559	-8.06967	-7.331418949	3	1	1
84	100106190	-8.58229	-7.903947408	3	1	1
85	101908912	-158.507	-96.94202108	3	0	1
86	100105020	-130.85	-75.69406244	2	1	1
87	301123125	69.12393	74.90412525	3	1	1
88	4200444916	-10.0343	-8.722892244	3	1	1
89	101326329	-57.4493	-37.47531747	2	0	1
90	100100689	41.51825	40.12132342	3	1	0
91	300393538	-4.19964	-5.891746991	2	1	0
92	301150295	54.79264	105.6263618	2	0	0
93	100151161	-68.8787	-54.56750885	3	1	0
94	3900242776	82.42106	63.52285289	1	1	0
95	100107042	90.13569	184.4611893	2	1	0
96	400101549	93.98447	142.1989944	2	1	0
97	4400116704	98.20114	121.0275032	3	1	0

98	302310209	36.61808	94.41337178	2	1	0
99	101482060	91.97173	135.1963347	2	1	0
100	1600230737	13.32885	31.50787994	3	1	0
101	100106257	-32.2897	-51.8379525	2	1	0
102	300381966	-46.2697	-74.57519998	2	0	0
103	100105380	200.7365	206.3842522	2	1	0
104	1600111049	98.31089	98.61747633	2	1	0
105	1800155452	163.0368	344.7253928	2	1	0
106	5700101637	34.15136	139.2912394	1	1	0
107	302166033	-20.2832	-44.79184878	2	1	0
108	5900189325	77.20332	204.3661095	2	1	0
109	100123319	70.36641	141.7717647	2	1	0
110	400100506	40.90444	69.2174448	2	1	0
111	2000110221	72.58994	153.1108305	3	1	0
112	4100259437	67.63345	159.6387967	3	0	0

Source: Author's data collection from HNX, HOSE and SSC

Table 15.3 The long-run nderpricing

MST	AR1	CAR 0,1	AR2	CAR 0,2	AR3	CAR 0,3	AR4	CAR 0,4	AR5	CAR 0,5	AR6	CAR 0,6	AR7	CAR 0,7	AR8	CAR 0,8	AR9	CAR 0,9	AR10	CAR 0,10	AR11	CAR 0,11	AR12	CAR 0,12
1600194461	-0.69696	-0.69696	-0.92741	-1.62438	-1.0275	-2.65187	-1.05026	-3.70213	-0.54257	-4.24471	-1.12926	-5.37397	-1.14764	-6.52162	-1.16447	-7.68609	-1.18335	-8.86945	-1.20576	-10.0752	-1.22431	-11.2995	-1.24552	-12.545
1600230737	0.055774	0.055774	0.036909	0.092683	0.034824	0.127508	0.026123	0.153631	-0.46626	-0.31263	0.000503	-0.31213	-0.02141	-0.33354	-0.04187	-0.37541	-0.05443	-0.42984	-0.06863	-0.49847	-0.07791	-0.57638	-0.08533	-0.6617
4100258955	-0.11693	-0.11693	-0.07387	-0.19079	0.079382	-0.11141	0.060028	-0.05113	0.079568	0.028439	0.019829	0.048268	-0.00143	0.046841	0.000411	0.047252	-0.02433	0.022921	-0.0428	-0.01988	-0.05744	-0.07732	-0.07511	-0.15244
1009312 99	-0.20727	-0.20727	-0.263	-0.47028	-0.24092	-0.7112	-0.21575	-0.92695	-0.42094	-1.34788	-0.22553	-1.57342	-0.23442	-1.80784	-0.22213	-2.02997	-0.21174	-2.24171	-0.20831	-2.45002	-0.20613	-2.65616	-0.20813	-2.86429
1010030 60	-0.26992	-0.26992	-0.36127	-0.63119	-0.34957	-0.98076	-0.34462	-1.32538	-0.39921	-1.72459	-0.35919	-2.08378	-0.38927	-2.47306	-0.40705	-2.88011	-0.42055	-3.30066	-0.42608	-3.72674	-0.42843	-4.15517	-0.43314	-4.58831

1300113091	0.004022	0.004022	0.002286	0.006308	-0.01833	-0.01202	-0.0399	-0.05193	-0.01001	-0.06194	-0.08029	-0.14223	-0.0927	-0.23493	-0.06873	-0.30367	-0.04949	-0.35316	-0.03072	-0.38388	-0.01968	-0.40356	-0.01318	-0.41675
301171827	-0.26162	-0.26162	-0.19044	-0.45206	-0.22816	-0.68022	-0.28412	-0.96434	-0.00988	-0.97422	-0.37288	-1.3471	-0.38238	-1.72949	-0.40333	-2.13282	-0.4449	-2.57772	-0.44457	-3.02228	-0.48984	-3.51213	-0.53077	-4.04289
330051 5171	-0.1451	-0.1451	-0.15071	-0.29581	-0.17569	-0.4715	-0.19827	-0.66977	-0.04486	-0.71463	-0.24337	-0.958	-0.25464	-1.21264	-0.26907	-1.48172	-0.27886	-1.76058	-0.28509	-2.04567	-0.29229	-2.33795	-0.30369	-2.64164
420023 8776	0.543794	0.543794	0.243449	0.787243	0.084211	0.871454	0.041024	0.912478	0.08	0.992478	-0.03812	0.954358	-0.06325	0.891106	-0.06936	0.821741	-0.06915	0.752587	-0.0738	0.678782	-0.07806	0.600726	-0.08487	0.515855
200827 051	0.151929	0.151929	0.089786	0.241715	0.127842	0.369557	0.118603	0.48816	0.109029	0.597189	0.124293	0.721482	0.126235	0.847717	0.13685	0.984567	0.126986	1.111553	0.141457	1.25301	0.118592	1.371602	0.089456	1.461058
360025 9296	0.430071	0.430071	0.421027	0.851098	0.408022	1.25912	0.413995	1.673115	0.396908	2.070023	0.312882	2.382905	0.261734	2.644 64	0.22232	2.866 96	0.192838	3.059 798	0.16916	3.228 957	0.147879	3.376 836	0.114202	3.491 039
100100 512	0.735812	0.735812	0.706209	1.442 021	0.882034	2.324 054	0.918479	3.242 534	1.249 095	4.491 629	0.967949	5.459 579	0.952128	6.411 707	0.947464	7.359 171	0.938151	8.297 322	0.903593	9.200 915	0.87171	10.07 263	0.843396	10.91 602
100114 145	-1.50889	-1.50889	-1.54386	-3.05275	-1.57296	-4.62571	-1.61065	-6.23636	-0.07466	-6.31102	-1.65389	-7.9649	-1.6827	-9.6476	-1.71553	-11.3631	-1.74492	-13.1081	-1.77121	-14.8793	-1.8093	-16.6886	-1.86513	-18.5537
100100 939	-0.25591	-0.25591	-0.28299	-0.5389	-0.29522	-0.83412	-0.1394	-0.97352	-0.20294	-1.17645	-0.34717	-1.52363	-0.42771	-1.95134	-0.48912	-2.44046	-0.56168	-3.00214	-0.62172	-3.62386	-0.68234	-4.3062	-0.74768	-5.05389
100100 456	-0.42003	-0.42003	-0.38674	-0.80676	-0.29905	-1.10581	-0.33177	-1.43759	-0.49505 2	-0.94253	-0.39021	-1.33274	-0.46587	-1.79861	-0.50179	-2.30039	-0.50522	-2.80562	-0.52358	-3.3292	-0.56798	-3.89718	-0.61094	-4.50812
570010 1637	0.170917	0.170917	0.112552	0.283469	0.063723	0.347192	0.023371	0.370563	-0.59408	-0.22352	-0.03767	0.261 19	-0.0611	-0.32218	-0.06899	-0.39117	-0.07279	-0.46396	-0.08269	-0.54665	-0.08805	-0.6347	-0.0931	-0.7278
100106 264	-0.6047	-0.6047	-0.60373	-1.20843	-0.63173	-1.84017	-0.65608	-2.49625	-0.46286	-2.95911	-0.69422	-3.65333	-0.71044	-4.36377	-0.7171	-5.08087	-0.73924	-5.8201	-0.75544	-6.57554	-0.77086	-7.3464	-0.79303	-8.13943
300033 6559	-0.09207	-0.09207	-0.11786	-0.20992	-0.12884	-0.33876	-0.14049	-0.47925	0.02	-0.45925	-0.15755	-0.61679	-0.17488	-0.79168	-0.18941	-0.98109	-0.20182	-1.18291	-0.2134	-1.39631	-0.22751	-1.62382	-0.25815	-1.88197
140038 4433	-0.72811	-0.72811	-0.89582	-1.62394	-0.97817	-2.60211	-1.00158	-3.60369	-0.04105	-3.64474	-1.05906	-4.70379	-1.04132	-5.74511	-0.99305	-6.73816	-0.93838	-7.67654	-0.92741	-8.60395	-0.85512	-9.45907	-0.79518	-10.2543
110010 1500	0.065749	0.065749	0.024748	0.090497	0.002944	0.093441	0.044649	0.13809	0.254949	0.393039	0.055532	0.448571	0.046558	0.495129	0.040326	0.535455	0.032945	0.568399	0.023587	0.591986	0.017954	0.609 94	0.014553	0.624493
302310 209	0.15326	0.15326	0.223494	0.376754	0.201955	0.578709	0.215039	0.793748	-0.43008	0.363668	0.285161	0.648 83	0.371813	1.020 643	0.359066	1.379 709	0.379888	1.759 597	0.409636	2.169 233	0.439522	2.608 755	0.476029	3.084 784
302533 156	-0.13271	-0.13271	-0.14902	-0.28174	-0.16781	-0.44955	-0.17982	-0.62937	-0.20594	-0.8353	-0.19846	-1.03376	-0.21376	-1.24752	-0.22713	-1.47465	-0.23574	-1.71038	-0.24107	-1.95145	-0.25494	-2.20639	-0.26264	-2.46903
440011 5884	-0.41157	-0.41157	-0.41991	-0.83147	-0.42412	-1.2556	-0.44362	-1.69921	0.11	-1.58921	-0.49324	-2.08245	-0.54004	-2.6225	-0.60723	-3.22973	-0.66475	-3.89448	-0.72109	-4.61557	-0.76896	-5.38452	-0.79634	-6.18087
300031 0977	-0.69176	-0.69176	-0.70417	-1.39593	-0.69875	-2.09468	-0.70766	-2.80234	-0.588	-3.39034	-0.67196	-4.0623	-0.66075	-4.72305	-0.66528	-5.38833	-0.66348	-6.05181	-0.65767	-6.70948	-0.67394	-7.38342	-0.69768	-8.0811

2900325068	-0.27389	-0.27389	-0.26987	-0.54376	-0.28747	-0.83123	-0.28958	-1.12081	-0.0601	-1.18091	-0.29415	-1.47506	-0.3039	-1.77896	-0.31225	-2.09121	-0.31908	-2.41029	-0.32767	-2.73796	-0.32746	-3.06543	-0.32797	-3.3934
4001013323	0.187316	0.187316	0.098909	0.286226	0.060116	0.346341	0.046999	0.393341	-0.06667	0.326674	0.078241	0.404915	0.081447	0.486361	0.087983	0.574345	0.091873	0.666217	0.091188	0.757405	0.084176	0.841581	0.079033	0.920614
3100130287	-0.17933	-0.17933	-0.17005	-0.34938	-0.18676	-0.53614	-0.20344	-0.73958	-0.001	-0.74058	-0.17916	-0.91974	-0.17182	-1.09156	-0.17376	-1.26532	-0.17327	-1.43859	-0.18264	-1.62123	-0.19205	-1.81327	-0.20818	-2.02145
4200444916	-0.5276	-0.5276	-0.51564	-1.04324	-0.48529	-1.52853	-0.48229	-2.01082	-0.248	-2.25882	-0.45628	-2.7151	-0.47746	-3.19256	-0.48509	-3.67765	-0.52039	-4.19804	-0.55271	-4.75075	-0.59613	-5.34688	-0.60895	-5.95583
200236845	0.123546	0.123546	0.247137	0.370682	0.348984	0.719666	0.403712	1.123378	0.511111	1.634489	0.463598	2.098087	0.482712	2.580799	0.496608	3.077407	0.485005	3.562412	0.478003	4.040414	0.468888	4.509302	0.453167	4.962469
4100258987	-0.07625	-0.07625	-0.11008	-0.18633	-0.12259	-0.30892	-0.15731	-0.46623	-0.0201	-0.48632	-0.08625	-0.57257	-0.12075	-0.69332	-0.20512	-0.89844	-0.26795	-1.16639	-0.30836	-1.47475	-0.33902	-1.81376	-0.36906	-2.18282
100107370	2.212697	2.212697	2.38579	4.598487	2.421143	7.01963	2.464514	9.484144	3.317456	12.8016	2.383928	15.18553	2.297105	17.48263	2.299993	19.78263	2.436745	22.21937	2.457068	24.67644	2.49894	27.17538	2.4291	29.60448
100151161	-0.77337	-0.77337	-0.79046	-1.56383	-0.78596	-2.34979	-0.76072	-3.11051	-0.50353	-3.61403	-0.67406	-4.28809	-0.63271	-4.92081	-0.60725	-5.52805	-0.58791	-6.11596	-0.56403	-6.67999	-0.54028	-7.22027	-0.51404	-7.7343
101394512	-0.77039	-0.77039	-0.86755	-1.63794	-0.91454	-2.55248	-0.94047	-3.49295	-0.43858	-3.93153	-0.96809	-4.89962	-0.96991	-5.86953	-0.95473	-6.82426	-0.94407	-7.76833	-0.92932	-8.69765	-0.92138	-9.61903	-0.92784	-10.5469
301123125	0.553349	0.553349	0.509028	1.062376	0.465607	1.527983	0.478652	2.006635	0.422659	2.429294	0.505142	2.934436	0.539969	3.474405	0.567064	4.04147	0.575778	4.617247	0.579228	5.196475	0.574474	5.770949	0.571703	6.342652
590018 9325	1.063797	1.063797	0.9848	2.048596	0.948412	2.997008	0.870505	3.867513	0.233574	4.101087	0.76429	4.865377	0.724729	5.590106	0.681071	6.271176	0.652601	6.923777	0.65091	7.574687	0.683158	8.257845	0.693033	8.950878
180015 5452	1.945879	1.945879	1.820036	3.765915	1.88131	5.647225	2.11778	7.765005	1.631668	9.396673	2.179714	11.57639	2.165848	13.74224	2.132662	15.8749	2.152912	18.02781	2.111104	20.13891	2.090127	22.22904	2.050432	24.27947
300422482	-0.083602	-0.083602	-0.000297	-0.083899	-0.04437	-0.039526	-0.11482	-0.0753	-0.18634	-0.26164	-0.18026	-0.4419	-0.2088	-0.6507	-0.22568	-0.87638	-0.22873	-1.10511	-0.23299	-1.3381	-0.23183	-1.56992	-0.23534	-1.80526
570010 1323	0.441107	0.441107	0.374783	0.81589	0.407824	1.223714	0.468439	1.692153	0.057662	1.749814	0.554556	2.30437	0.586327	2.890697	0.622611	3.513308	0.627789	4.141097	0.648408	4.789505	0.671628	5.461133	0.673 78	6.134912
460010 0003	-0.05411	-0.05411	-0.01894	-0.07305	-0.00199	-0.07504	-0.05211	-0.12715	-0.250529	-0.123381	-0.01231	-0.111069	-0.06298	-0.048089	-0.14531	-0.09722	-0.21727	-0.31449	-0.1704	-0.48489	-0.0822	-0.56709	-0.02844	-0.59553
350010 0424	0.724148	0.724148	0.658691	1.382984	0.549971	1.932981	0.455988	2.388798	1.580938	3.969736	0.321967	4.291703	0.278828	4.570 53	0.256665	4.827196	0.223029	5.050225	0.199018	5.249243	0.160696	5.409938	0.129487	5.539425
390024 2776	0.457599	0.457599	0.41115	0.868749	0.449976	1.318725	0.485708	1.804432	0.782239	2.586671	0.494549	3.08122	0.465626	3.546846	0.425657	3.972503	0.407965	4.380468	0.407474	4.787942	0.403774	5.191716	0.409349	5.601065
100100047	0.085877	0.085877	-0.15326	-0.06738	-0.34702	-0.41444	-0.35974	-0.77415	-0.12288	-0.89702	-0.46949	-1.36651	-0.51873	-1.88525	-0.55955	-2.44479	-0.6045	-3.04929	-0.63937	-3.68866	-0.66702	-4.35568	-0.67278	-5.02845
330010 1300	-0.35258	-0.35258	-0.17666	-0.52924	-0.38521	-0.14402	-0.50139	-0.35737	-1.47392	-1.83129	-0.46725	-2.29856	-0.42817	-2.72697	-0.38882	-3.11556	-0.47183	-3.58739	-0.57587	-4.16248	-0.59773	-4.75955	-0.59553	-5.35548
100107123	-0.19812	-0.19812	-0.21766	-0.41578	-0.23114	-0.64692	-0.2338	-0.88072	-0.050341	-0.83038	-0.26525	-1.09563	-0.2809	-1.37654	-0.29277	-1.66931	-0.33341	-2.00272	-0.37334	-2.37606	-0.39961	-2.77566	-0.43275	-3.20841

300448709	-1.14822	-1.14822	-1.14209	-2.29031	-1.14241	-3.43272	-1.1731	-4.60582	-0.65712	-5.26294	-1.21715	-6.4801	-1.28129	-7.76138	-1.32926	-9.09064	-1.3981	-10.4887	-1.4693	-11.958	-1.49961	-13.4576	-1.52413	-14.9818
300585984	0.250257	0.250257	0.400561	0.650818	0.343663	0.994481	0.289797	1.284278	0.387535	1.671813	0.213553	1.885365	0.18917	2.074535	0.18361	2.258145	0.155087	2.413232	0.132218	2.54545	0.099303	2.644753	0.059739	2.704492
300393538	-0.37743	-0.37743	-0.34359	-0.72102	-0.36399	-1.08501	-0.3765	-1.46151	-0.67578	-2.13729	-0.3828	-2.52009	-0.38913	-2.90923	-0.38974	-3.29897	-0.39809	-3.69706	-0.40372	-4.10077	-0.4013	-4.50207	-0.39446	-4.89654
400101901	-0.74582	-0.74582	-0.73061	-1.47642	-0.72472	-2.20114	-0.72188	-2.92302	-0.52904	-3.45206	-0.70613	-4.15819	-0.68303	-4.84122	-0.66827	-5.50949	-0.66667	-6.17616	-0.65966	-6.83582	-0.64868	-7.4845	-0.63295	-8.11745

Notes : Because of a long table and display, the author only represents the long-run underpricing measures up to 12 months after IPOs