

Do Vietnam's State-Owned Enterprises Improve Their  
Performance after Equitization? Evidence from the  
Last Decade

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## Abstract

Low economic performance has been a persistent problem in the development of transition economies. Privatization has been widely accepted as a method to improve firm's efficiency to various degree of effectiveness. The main objective of this study is to examine the impact of equitization, or partial privatization, and its extent on firm performance in Vietnam. By exploiting the timing of equitization and using a staggered difference-in-difference strategy and event studies, I examine how equitization affects state-owned enterprises through measures of profitability, operating efficiency and reliance on leverage. By using data from the newest equitization phase, I also provide new information on the effect of equitization on more structurally complex firms.

I find that equitization has limited effects on various measures of firm performance in the short run. However, the event study results suggest that the improvements in firm performance may appear after some period of adjustment. Moreover, through interacting private ownership share and equitization dummy, I find a negative effect of private ownership on indicators of firm performance. This suggests that there are other considerations that will be required to fully understand the effect of equitization on firms' performance.

**JEL Classifications:** L22, L33, O25, P24, P31

**Keywords:** : Privatization, Equitization, Firm Performance, State-Owned Enterprises, Vietnam

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# Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
<b>2</b>	<b>Conceptual Framework &amp; Mechanism</b>	<b>9</b>
2.1	Privatization Theory . . . . .	9
2.2	Mechanism . . . . .	12
<b>3</b>	<b>Policy Background</b>	<b>15</b>
<b>4</b>	<b>Data</b>	<b>18</b>
4.1	Sources . . . . .	18
4.2	Variables . . . . .	22
<b>5</b>	<b>Empirical Strategy</b>	<b>26</b>
5.1	Limitations of Previous Empirical Approaches and Proposed Improvements	26
5.2	Methodology . . . . .	27
<b>6</b>	<b>Main Results</b>	<b>29</b>
6.1	Two-way fixed effects regression . . . . .	29
6.2	Event Study . . . . .	32
<b>7</b>	<b>Robustness Check</b>	<b>36</b>
7.1	Additional selection bias control: . . . . .	36
7.2	Alternative transformation for Profit values . . . . .	37
7.3	Control for age and labor size: . . . . .	37

7.4	Limit to full-panel data: . . . . .	39
7.5	Introduce Percentage Private Ownership . . . . .	39
<b>8</b>	<b>Conclusion</b>	<b>41</b>
	<b>References</b>	<b>43</b>

# 1 Introduction

The fall of the Soviet Union at the end of the Cold War in the early 90s has signaled a departure of centrally planned economics and arrival of open markets and economies. One of the most prominent questions troubling transition economies in this time period was how to improve the performance of their struggling industries, especially those whose competitive advantage has been lost in the era of globalization. The most common solutions was to privatize these inefficiently-run public enterprises to inject an efficiency boost. Most transition economies in Eastern Europe thus started their privatization projects in this period, but this trend was not adopted in Asia until the late 1990s and early 2000s.

Despite the fact that privatization was widely accepted as a suitable method for nations to de-emphasize the role of government and strengthen the role of market players, there is still an ongoing debate on the merits of full and partial privatization. Various research was made to investigate into which specific circumstance allowed privatizations to be successful (Azam et al. (2004) ) and which limited its success (Beck et al. (2005)). There were also considerations into disparate performance of privatizations process across industries, which are adequately summarized by Estrin and Pelletier (2018). In addition, there is an ongoing debate on the merits of full privatization versus partial privatization, which warrants another strand of research to explore the performance changes of firms after they divest part of their shares, but not their entire ownership, to the private sector. Gupta (2005) argues that partial privatization leads to improvement in profitability, productivity and investment for state-owned enterprises (SOEs) in India. However, the empirical evidence on the effects of equitization is limited. In this paper, I examine the effects of partial privatization on the performance of state-owned firms by exploiting the variations in equitization induced by the different waves of equitization in Vietnam over the last decade.

Vietnam was not an exception in the global process of privatization, despite its various distinguishing differences. Firstly, the privatization program in Vietnam is referred to as "equitization", in which state-owned enterprises (SOEs) were transformed into joint-stock enterprises through selling of their shares. While privatization describes a process of total relinquish of government's control of an enterprise through complete sale of its shares to the private sector, equitization represents a nuanced difference in which SOE's shares were sold off partially rather than completely to private investors, through usage of stock issuance on stock markets. Secondly, another remarkable difference of equitization from usual Western privatization practices is that employees and managers of the firms acquire a substantial portion of the shares in the equitized firms. This buy-back mechanism will provide incentives for workers and managers of state-owned enterprises to perform more efficiently as they hold a stake of the company.

In addition to practical interests, equitization is also of theoretical interest because it offers insights into why SOEs perform poorly under government's control. The *political* view argues that governments pursue objectives that are in conflict with profit maximization, and this political interference can distort the objectives and constraints faced by managers, derailing firms' performance as a result (Boycko et al. (1996)). The *managerial* view is that state-owned firms have difficulty monitoring managers because there is neither an individual owner with strong incentives to monitor managers nor a public share price to provide information about manager actions as judged by stock market participants (Laffont and Tirole (1993)). According to Gupta (2005), full privatization makes it difficult to distinguish between the political and the managerial perspectives because both ownership and control shift to the private sector at the same time. In contrast, under equitization, some shares of the firm are traded on the stock market while the firm remains under government control and subject to political interference.

In this study, I examine the effect of equitization through the channel of managerial view instead of the political view. I find results indicating that equitization improves

profitability and efficiency through the managerial perspectives, but there are dynamic effects of equitization that is only captured after a few years of equitization. These findings are consistent with the results in Carlin and Pham (2009), who show that equitizing firms struggle in the first few years to establish their economic goals clearly. This also helps us understand how managers take time to respond to market forces, through performance of equitizing firms.

Under the Equitization Program, the government has various goals, including stopping loss of public funds in struggling industries, boosting manufacturing and trade activities through inviting foreign investment and private investment, and most importantly enhancing firm's competitiveness. The commencement of the country's equitization program was in 1992 with its pilot in some SOEs, but it was not until mid-1998 (after the promulgation of Decree No. 44/ND-CP) that it was actually implemented.

Given the slightly different nature of equitization, one of the main concerns of the process has been on how it affects firm performance. To date there have been a few issued research investigating the equitization impact on the performance of Vietnamese enterprises (Loc et al. (2006), Tran et al. (2015), Loc and Tran (2016) ). Nonetheless, these research projects have been focusing solely on the period before 2010, which only includes firms in the first and second wave of equitization. One pivotal turning point in the progress of equitizing Vietnam's enterprises was the issuance of Decision No.929/QD-TTg on July 17, 2012, focusing the equitization scheme on large Economic Groups and Parent Enterprises. These enterprises are more complex in structure and have various financial branches, which will complicate the process of equitization and affect the levels of improvement in performance of the equitized businesses. Currently, the only research that has been published examining this period is by Van Tan (2018) which only focuses on performance of equitized firms in one specific year of 2014.

Studying the causal effects of equitization is challenging due to the threats to validity



caused by the selection bias that arises from which firms are selected for equitization. Earlier research in the field like those done by Megginson et al. (1994) and Loc et al. (2006) utilized only Wilcoxon test to compare the performance indicators of firms before equitization versus after equitization (dubbed the pre-post method), which does not offer any control for selection. The Wilcoxon signed-rank test is a nonparametric test used to compare between matched-pairs of different groups of observations, to see if there is a difference in the mean and distribution of the two groups. This test is not sufficient because it can only show differences between the two groups, but cannot offer answers to what causes these differences. In the context of this paper, the Wilcoxon test is limited in showing us whether the changes seen for firms before equitization versus after equitization is due to the equitization process itself, or due to other unobservables in the environment or time period considered. Recent research (Tran et al. (2015) , Loc and Tran (2016)) attempted to correct this by introducing Propensity Score Matching to produce control and treatment groups that are more similar to each other, before conducting difference-in-difference analysis. This method, while ameliorating the problem of selection bias, does not fully address it as propensity scores matching can only utilize existing information to set up its groups, which is insufficient when dealing with SOEs in developing economies as choice of equitization might involve other unobserved factors.

I contribute to the literature by suggesting a different control group involving pre-equitization observations of firms equitizing in later periods. I argue that this method would be a better method than using propensity scores, because with my panel data, I will be able to construct a more comprehensive control group of firms that equitizing in the same phase, thus are arguably more similar to one another. While I acknowledge that issues of selection bias still remains as some firms are equitized later than others, this method would significantly reduce the bias existing due to incorrect matching from propensity scores.

At this point, this study also comes in to provide two main additions to the existing

research. Firstly, it attempts to provide more empirical evidence of the equitization impact on firm performance in Vietnam, using the most recent data to analyze the effect on more structurally complicated enterprises. Its originality and importance lie in the use of a panel data with a large sample of equitized SOEs from 2010 to 2018 to capture the third wave of equitization in Vietnam, which is currently inadequately unexamined. Furthermore, to overcome the methodological limitations of earlier studies which also examined the equitization–performance nexus, I incorporate using a two-way fixed effects model, applying the approach of staggered difference in differences (DID) for the empirical analyses as I will be using panel data across different years. Accompanying the regression analysis would be an event study that aims to provide a more holistic picture to the performance changes of firms after equitization.

I find that equitized firms perform better under all profitability outcome considerations, but the effect on operational efficiency outcomes are less clear. Interestingly, I also found results indicating equitized firms actually increase liabilities and debt usage, which is contrary to popular notion that these firms will rely less on debt funding to expand. Most of the results have large variations in its coefficients, indicating statistical insignificance at time. This might be explained by the nature of firms concerned in this equitization phase being more structurally complicated. I also find results supporting the idea that performance changes are not imminent, but usually take a longer time to materialize. This is seen through the event studies, which shows increase in profitability measures in time periods further from the equitization time, and the increase in profitability becomes most noticeable after 3 years of equitization.

The rest of this paper proceeds as following: Section 2 explains the conceptual framework and mechanism through which equitization can affect performance, Section 3 provides a summary on the equitization process in Vietnam, Section 4 discusses the data, Section 5 presents the empirical strategy employed in the literature and used in the paper, Section 6 discusses the main results and event studies, Section 7 conducts the

robustness checks, and Section 8 concludes with the key lessons from the main findings.

## 2 Conceptual Framework & Mechanism

### 2.1 Privatization Theory

Economic theory suggests that there are important roles SOEs can play in assisting with the national economy. The most common issue that SOEs deal with relates to problems of natural monopolies and market failures. The natural monopoly issue exists in industries where there is substantial fixed cost for a firm to participate in. When incumbent firms have already invested, this high cost became sunk cost for them, yet still remain a large start-up cost for other potential entrants, generating a strong barrier to entry in the industry. SOEs that are natural monopolies are usually formed in industries like utilities (mainly electricity or water production and distribution) or telecommunications. In such cost situation, Posner (1978) suggested that the industry is likely to accommodate only one firms, thus state ownership is sometimes recommended as a device to protect consumers from excess monopoly power. More generally, in situations where there are signs of market failures in terms of externalities, the externalities create a difference between the marginal private costs/benefits and the marginal social costs/benefits. Private firms producing at their marginal private equilibrium will either under or over-produce the goods, causing a deadweight loss. In such market, SOEs are required to produce the goods at socially optimal level and eliminate the deadweight loss.

Besides economic reasons, there are strategic reasons for why the government wants to maintain control in some industries via SOEs. In socialist one-party societies like Vietnam for instance, there is an incentive for the government to maintain order and support from the community. This entails the control of industries that provide basic goods like water, electricity or healthcare. Through SOEs in these industries, the gov-

ernment injects substantial subsidies and ensures low-cost provision of these goods for political purposes. In my dataset, I have identified that there are 78 firms that operate in industries of such kind that are being equitized, ranging from large enterprises to subsidiaries and smaller local firms.

However, opponents of SOEs bring forth two main arguments against it from the political to managerial perspectives. These two arguments are complementary of one another and deftly explained through the agency theory framework, emphasizing a lack of performance and efficiency of SOEs by Boubakri et al. (2008). It is argued that inefficiency and value destruction are the most frequent problems of state ownership because political agenda are often not aligned with economic objectives. Through ownership shifts, governments in developed as well as developing countries believe that privatization programs will depoliticize firms' objectives, thus improve the economic and financial performance of SOEs (Boubakri et al. (2004)). Furthermore, looking from a managerial perspective, Rousseau and Sheng (2008) argue that inadequate monitoring of SOE managers lead to weak incentives to improve operational efficiency. To cap off everything, the agency framework proposed by Boycko et al. (1996) combines both the political and managerial view to propose that the separation of ownership (public) and control (politicians) and the absence of ownership incentives create agency problems.

From a political perspective, it is undeniable that SOEs are often important political tools for the government to issue directives to further their political gains, and this exact political interference could result in operational constraints and distorted objectives as SOEs might not be pursuing profit-maximization goals. Boubakri et al. (2008) suggests that they might be maximizing employment and wages close to election time, relocate production to locations that are politically desirable but not economically beneficial, or produce excess goods and services to gain favors and ensure support from other politicians. From the managerial perspective, Vickers and Yarrow (1988) posit that leaders in SOEs are often poorly monitored and judged, causing them to have a high incentive to

pursue their own agenda and engage in corruption, thus leading to SOEs' operation to remain inefficient.

The agency theory framework by Boycko et al. (1996) combines these aforementioned views into a core issue: ownership of SOEs is with the public yet the management of firm assets is by civil servants and politicians. This ownership rights are divided between taxpayers, rendering each individual limited say in the decision-making of the company. However, the control of them is ultimately in the hands of politicians and managers with legitimized political, social and economic goals. Management and staff of SOEs have incentives to seek firm-specific rents such as high pay, fringe benefits and low effort levels. Furthermore, if we explore these stakeholders in the context of socialist societies, Sun et al. (2002) show that the CEOs of the SOEs in China are usually appointed by the government, and Perkins (1994) shows that the compensation of these CEOs is not necessarily linked to the firm performance but rather to their loyalty to the political goals of the government. To the extent that that there is misalignment in what is best for the firm, the public and the government, these findings warn us that managers of SOEs in socialist countries may not have the incentive to efficiently operate the firms and may take decisions that only benefit special interest groups. There are similar concerns when it comes to SOEs in Vietnam. Tran et al. (2015) argue that CEOs chosen for their political connection instead of their managerial qualities can be regarded as an adverse selection problem, inflating agency costs in state-owned companies, which could damage performance.

Proponents of privatization thus argue that such problems will be effectively controlled or eliminated in the private sector. Owners of private firms do not answer to politicians but only focus on maximizing their own profits and utility. As such, managers employed by them face economic and financial pressures to perform efficiently instead of political pressure to serve other agendas. Nguyen and Do (2007) also provided evidence that managers in private companies are also more inclined to seek rents as they face the

risk of replacement or dismissal and must cope with the external control mechanism of the labor market for managers as well as the internal control mechanism such as executive compensation, as similarly suggested by Cuervo and Villalonga (2000).

At this point, discussion on equitization, or partial privatization, versus full privatization becomes more prominent. In comparison to privatization, equitization differs in an important way: shares of the equitized firm are partly traded on the stock market, or sold to private investors while the firm remains partially under government control and subject to political interference. Thus, we are able to test the managerial perspective that inadequate information about managers is an important factor in the inefficiency of state-owned firms. According to Gupta (2005), because of its intermediate position between public and private ownership, partial privatization also offers insight into the more general question of whether financial markets can alleviate agency problems due to the separation of ownership and control. Studies of partial privatization can investigate the information effect on performance while minimizing the confounding dilution effect of going totally public, which might be affecting performance as fully private firms might be too diluted such that stakeholders do not agree on a specific action, leading to increase in agency cost.

## **2.2 Mechanism**

The literature informs this study of various ways privatization can affect performance through different channels. Equitization will affect performance through the same channels, albeit to a changing extent, as discussed in each mechanism.

Firstly, private ownership may improve the profitability of firms. Tran et al. (2015) suggests that privatization redirects the focus of SOEs from a variety of diffuse goals as explained above to (long-term) profit goals. Various reasons can be offered to explain for this phenomenon, but they all focus on the crucial idea that privatization shifts both

the control rights and the cash flow rights from politicians to managers. Thus, managers could avoid overspending on excess labor, on promoting of regional development and on national security for electoral and political purposes, which would cut down on cost. Furthermore, more funding, labor and resources can be reallocated to areas that are main revenue streams of the business, rather than being dispersed to serve other non-economic purposes, thus increasing revenue size, and overall increase profits for firms.

Given that equitization only implies a partial shift of cash flow rights and control instead of the full effect, we should still see the revenue and profit size increase due to the aforementioned reason, but it will take a longer time for a pronounced effect to be seen. In this study, I will test for gains in profitability by measuring changes in log of profit, the rate of return on total assets (ROA) and return on equity (ROE), which have been traditionally chosen as profitability measures by the literature.

Secondly but relatedly, private ownership may also improve the efficiency of firms. The shift in incentives for managers to focus on value and profit maximization, rather than on a myriad of political and social objectives, most likely encourages managers to redress excess spending on labor, but rather only keeping only the labor force that contributes the most to the company profit objectives and cutting down on inefficient and underperforming members. Privatization may increase in labor productivity, which is an operating efficiency that this study will attempt to measure through the proxy of value added per employee, and decrease in labor costs. The literature has followed similar path, as suggested by Boubakri et al. (2004), Loc et al. (2006), Tran et al. (2015), Van Tan (2018).

For equitization, the argument is similar, with only the slight difference that the relinquish of control is not instantaneous: equitized firms only experience the managerial shift immediately, but the control still remains strongly influenced by the government, leading to a possible delayed effect on efficiency. In this study, I will test for gains in

operating efficiency by measuring changes in sales efficiency of labor, as well as in changes in total wages paid to labor.

Thirdly, we can predict another likely effect of privatization is a change in leverage and debt restructuring. For SOEs operating in a command or planned economic environment, the cost of capital is not a well defined concept. Tran et al. (2015) asserted that the allocation of capital for replacement and investment is not decided by economic markets or rationale, but rather solely by government agencies or the state banking system. This is further supported by Boubakri et al. (2004) as in principle, SOEs have unconditional access to capital and do not have to weight the cost of borrowing capital in their decisions.

However, private firms will follow an entirely different concept to decide the level of investment and the method of financing investments. In private firms, investment is guided by the principle that the expected marginal return on investment should cover the marginal cost of capital. For private companies, the cost of capital is a weighted average between the return on equity capital and the cost of borrowed funds at market prices. As such, following privatization, the cost of borrowing is likely to increase due to the absence of government debt guarantees and the risk of bankruptcy (Loc et al. (2006)). On the other hand, Megginson et al. (1994) posited that privatized firms would have access to an alternative source of financing that is public equity markets. Both elements, the increase in the cost of debt due to loss of government risk guarantees and access to equity capital markets, contribute to a change of the financial structure of the company. Sun et al. (2002) has shown results in China that the level and share of debt will be reduced following privatization. Previous studies also discover a decline in leverage post-privatization (Omran (2004), Mathur and Banchuenvijit (2007)).

Equitized firms are nonetheless in a unique situation to borrow funds, with both access to government's funding and to private equity markets, as the government still



holds controlling stakes in the company while its shares are also sold to private investors. The more available choices can be construed as a reduction in cost of borrowing, as equitized firms will have the option to choose from the government's or private market's pocket for its funding, thus increase their reliance on leverages. In this study, I will test for change in debt structure and leverage by examining solvency ratio changes.

These mechanisms have been tested in Vietnam in various papers. The first official look into Vietnam utilized equitization data from 2004 and 2005 and focus solely on the southern region of Vietnam. Loc et al. (2006) initially analyzed the effect of equitization using the MNR method (originates from Megginson et al. (1994), which employed the pre-post comparison approach for measuring the effect of privatization on firm performance by conducting Wilcoxon signed-rank test to compare the mean value of interested financial indicator after privatization with that before privatization, revealing that profitability, efficiency and employee income increase significantly following equitization. An important follow-up to their paper is that done by Tran et al. (2015), who uses data in the second equitization phase (2000 to 2010). They also tackles issues of selection bias using propensity score matching (PSM) method to adjust for the difference in characteristics by assigning each individual observation a propensity score that accurately reflects the probability that the individual be assigned to the treatment given a set of observed covariates, and finds that profitability and operating efficiency also increase significantly after equitization.

### **3 Policy Background**

According to Odle (1993), the privatization experience of the developing and developed countries can be classified into traditional, transitional and transformation stages. In the traditional stage, countries select enterprises where the private sector has significant comparative advantage to public. In the transitional stage, privatization becomes more

generalized to various different industries and might involve few important enterprises. However, the most strategically significant enterprises, operating in industries of national importance, are only privatized in the third stage, the transformation stage, signaling a transition to a pure capitalist economy.

As suggested by Van Tan (2018), Odle’s stages theory is observed in the equitization plan of Vietnam, which is separated into three phases: the pilot stage (traditional stage), promotion stage (transition stage) and the current restructure stage (transformation stage). Consider the following graph obtained from Van Tan (2018), which shows the number of firms equitizing every year and the percentage of firms equitizing that year out of all those equitized between 1992 and 2017:

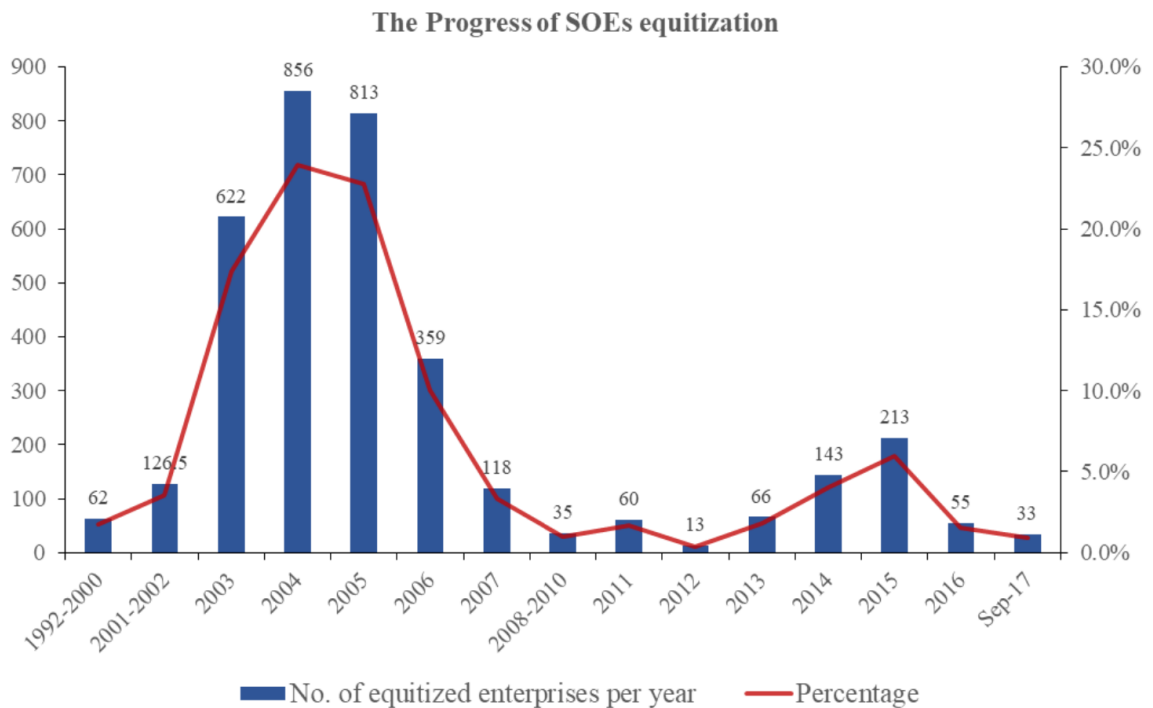


Figure 1: Number of equitized firms by year, from 1992 to 2017

In the pilot stage (from 1992-2000), 558 enterprises were equitized. In this stage, the progress was slow due to lack of an official Law of Enterprise. The selected enterprises for equitization were medium-and small-sized ones, that are either profitable or struggling with potential for better profits. The pilot equitization stage was under Decision No. 202/CT issued on 8th June 1992 and Direction No. 84 issued on 4th Aug 1993, but the process did not pick up until the Government issuing Decree No. 28/CP issued on 7th May 1996, officially giving SOEs instructions about purposes of equitization, criteria of SOEs selection, privatization methods, employment incentives and investment incentives for equitized enterprises.

In the promotion stage (from 2001 to 2010), 3126 enterprises were equitized, accounting for more than 70% of total number of equitized enterprises. The period of 2003-2006, called the "explosion" stage of equitization, witnessed a very high average number of equitized enterprises per year, which coincided with the trend of market economy when Vietnam prepared to join the World Trade Organization (WTO). Along with the trend of equitization, the growth of the non-state sector was considerably increased in terms of market share, enterprises number, number of employees, capital and investment.

In the restructuring stage (from 2010 up to now), the focus of the program has been on Corporate Groups and Parent Enterprises. These enterprises are collections of parent and subsidiary corporations that function as a single economic entity through a common source of control, and thus are structurally more complicated with larger financial value. In this stage, enterprises operating in industries that are not deemed of national importance are chosen for equitization, regardless of size and economic importance. Furthermore, the equitization progress has been slow. According to the Scheme on restructuring SOEs in the 2011-2015 stage, the total number of equitized enterprises would be 495, but there were only 28 that started equitizing by 2012. The reason for this slow start was that the official decision, Decision No.929/QD-TTg, was not officially released until July 2012. As such, we see that the number of equitized firms increased

drastically from 2013 onwards.

In this stage, the equitization progress has been slow due to a number of main reasons. Firstly, there are many ideas that state-owned enterprises should play the leading role, so reducing the number of state-owned enterprises will reduce this role. Secondly, after more than 15 years of equitization, the remaining SOEs in the equitization list are medium and large-scaled ones. The equitization of large-scaled ones is increasingly complex, especially in the valuation of state-owned assets. Third, some leaders or agents of state-owned enterprises fear that they will lose or reduce their control enterprises when transforming SOEs from state ownership to private ownership, so they have actively slowed the equitization progress and interfered the equitization process. The government's retention of majority shares in most equitized SOEs and many equitized SOEs' failure to promptly get their shares listed on stock exchanges, caused investors, especially foreign ones, to lose confidence in the government's equitization program. This issue will also affect the effectiveness of equitization, as the delay to divest shares implies that the private sector can only influence firm decisions after a long period of time, instead of immediately. In addition, other important reasons were the economic crisis and the volatile stock market in 2008 which affected the pace of SOEs' equitization process in Vietnam.

## **4 Data**

### **4.1 Sources**

The analysis is based on detailed administrative data from two sources. The first source, which provides the main data for analysis, is a commercial source of data extracted from the annual business surveys, which are conducted by the Vietnamese General Statistics Office (VGSO) for the period 2010 to 2018, an annual census collecting financial and

other data on all business firms in Vietnam. Firms are identified by their tax IDs and were generally classified into three groups: (i) SOEs including all firms defined by the VGSO as “central/local state-owned enterprises (SOEs) and central/local state limited company, with more than 50% ownership by the government”; (ii) private firms including firms defined as “private enterprise, partnership company, private limited company, joint stock company without state capital and joint stock company with state capital being smaller than 50%” and (iii) foreign firms defined in the VGSO survey as “wholly foreign-owned company and joint-venture (SOE and foreign partners; non state company and foreign partners)”. The data also provides other information regarding firms’ size, ages, number of employees and various financial indicators of firms’ performance.

The second source comprises lists of firms that were actually equitized in from 2011 to 2017. This was obtained from Vietnam’s Steering Committee for Enterprise Renovation and Development, the agency in charge of planning and executing the equitization plan. As the lists were provided in paper form, manual tax ID matching was carried out, and due to matching issues regarding differing tax IDs post-equitization, some firms that were indicated were not matched onto our dataset. Below are two figures showing the number of firms in the original list and in the data that I was able to match:



(a) Number of equitized firms from the list



(b) Number of equitized firms from the data

Figure 2: Number of equitized firms

From figure 2, there is a drop in the number of firms that showed up in the data in comparison to what there was from the list. An important consideration for the drop (from 483 to 331) is that firms that drop out completely from data are those that are completely privatized, thus are not provided in the dataset sent to me by the Statistics Office. This would not impact heavily our understanding of equitization effects, because I would consider those privatized to be already outside of the scope of this paper.

It is also important to see the composition of the industries that exist within the enterprises that were chosen for equitization. As discussed from the theoretical framework, industries that exhibit characteristics of a natural monopoly would not benefit from a transition to private sector, while those involving banking and financial services would benefit more from private sector operations due to the nature of the industry.

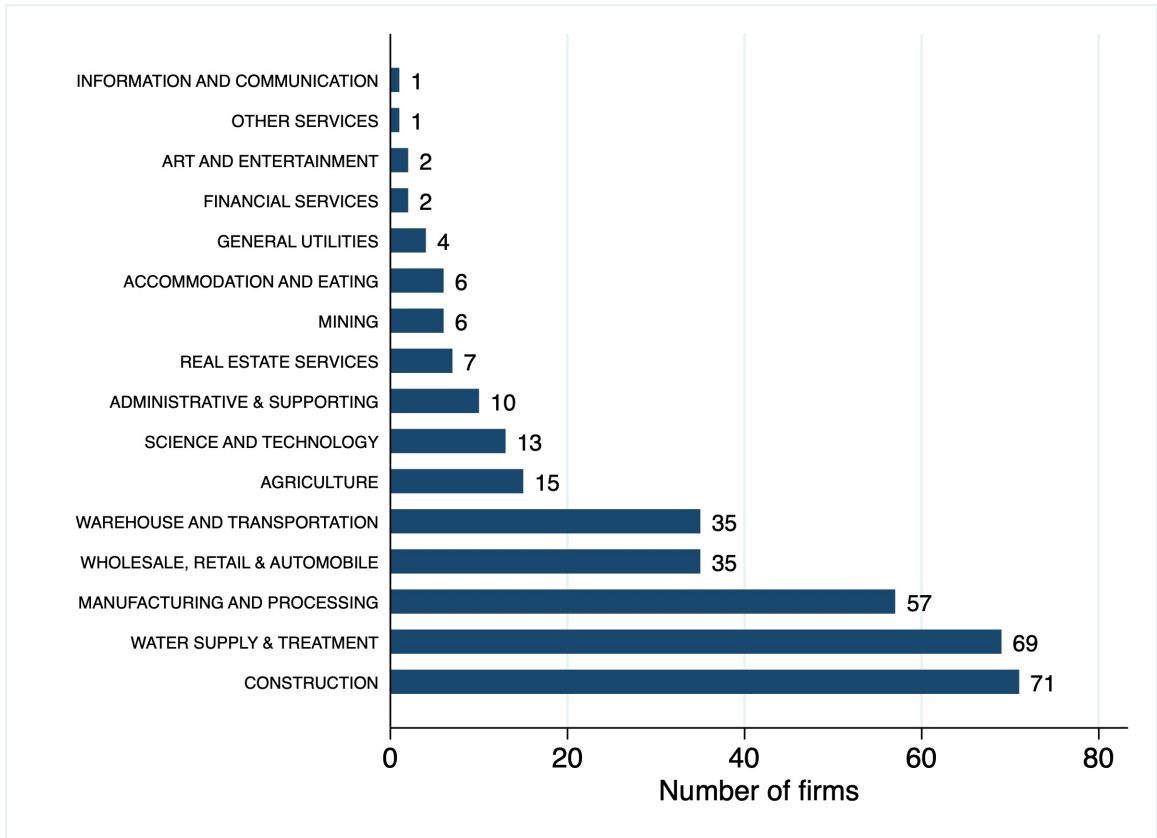


Figure 3: Number of equitized firms by industry from in the data

Figure 3 shows the industry distribution for equitizing firms in the dataset. The figure shows that few enterprises operating in financial services were equitized during this period (2), while there are more than 70 firms that operate in utilities or water supply and treatment out of the 331 in the dataset. This composition of industry might suggest that many firms that are equitized would theoretically benefit from remaining state-owned, thus might confound our research findings.

## 4.2 Variables

In this section, I will examine the summary statistics and observe the trends of the outcome variables that will be used as proxy to measure firms' performance. Below is a table with a quick summary of what the variables are, how they are calculated and which mechanism they intend to evaluate:

Variables	Proxies	Measurement
<b>Dependent Variables (Performance measures)</b>		
(1) Profitability	Log Profit (logProf)	$(\log  minProfit  + Profit + 1)$
	Return on Assets (ROA)	Profit / Total Assets
	Return on Equity (ROE)	Profit / Total Equity
(2) Operating Efficiency	Sales Efficiency (salesEff)	Sales / Total Labor
	Labor Wages (totalWages)	Total Wages
(3) Leverage	Solvency Ratio (solv)	Liabilities / Total Assets
<b>Control Variables</b>		
	age	Age of enterprise
	labor	Labor size of enterprise

Table 1: Interested Outcome Variables

While most of the variables <sup>1</sup> have been discussed in the mechanism, some explanations should be given to the inclusion of Log of Profit in the Profitability measures. The reason for this inclusion is for us to see the extent of changes of profit itself between the control group and treatment group, which will offer some insights to profitability changes. The measurement is calculated as such because the data includes negative values of profit, which cannot be transformed using the log function, thus warrants the addition of minimum profit (which is a negative value) and 1 (to ensure no value of 0).

I present below some summary statistics for the interested outcome variables, separated by three groups, representing observations of firms before equitization, after equitization and not equitized at all. The value reported is the mean of the observations in of each outcome variables in each category:

<sup>1</sup>The units of logProfit is log million VND, of salesEff is million VND per worker, of totalWages is million VND. ROA, ROE and solv do not have a unit as they are ratios of two quantities with the same units

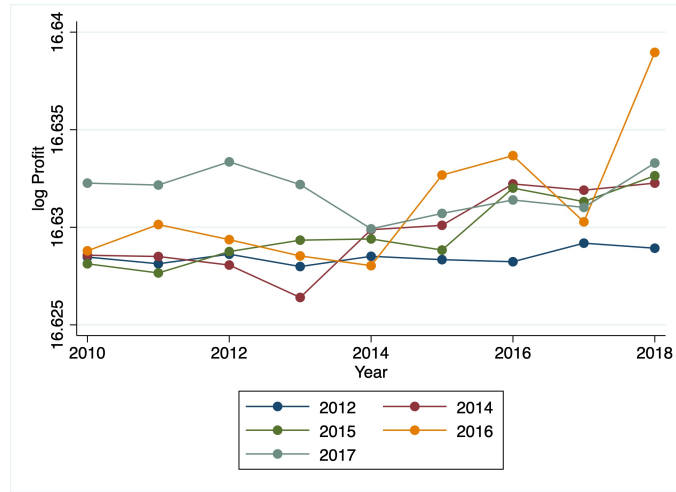
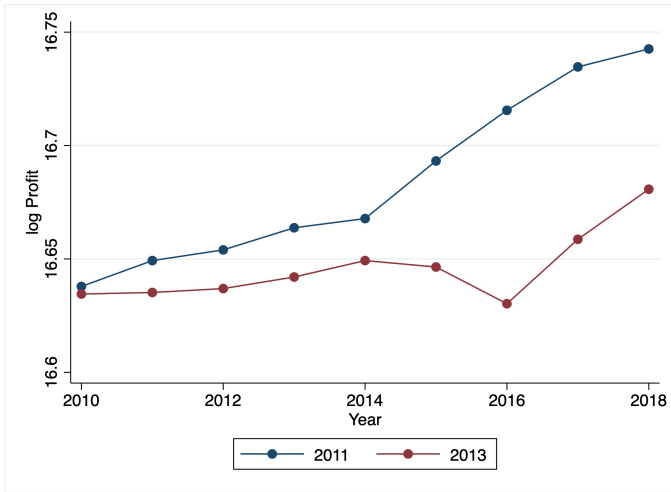


	(1)	(2)	(3)
	Pre-equitization	Post-equitization	Non-equitized
Log of Profit	16.62953	16.63649	16.62917
Return on total assets	.0308364	.0348292	.0627924
Return on equity	.0768742	.0882575	-.1450394
Sales Efficiency of Labor	1186.338	1475.485	2473.306
Total Wages Paid to Labor	58425.16	116264.3	55306.05
Solvency ratio	.5294279	.5163393	.3511799
Observations	1571	1208	21828

Table 2: Summary statistics of outcome variables by groups

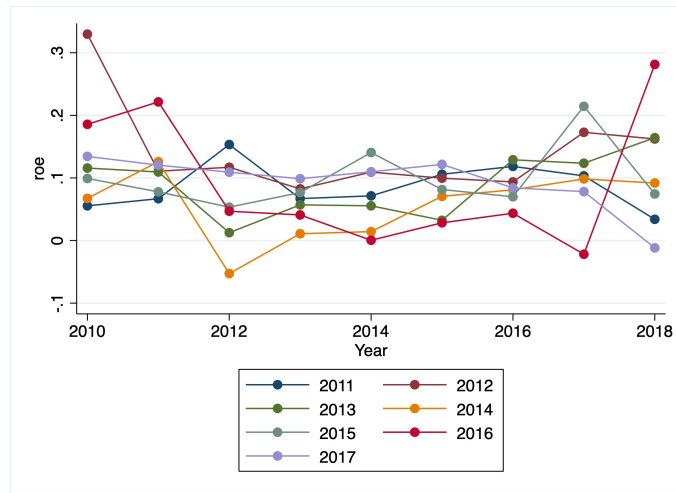
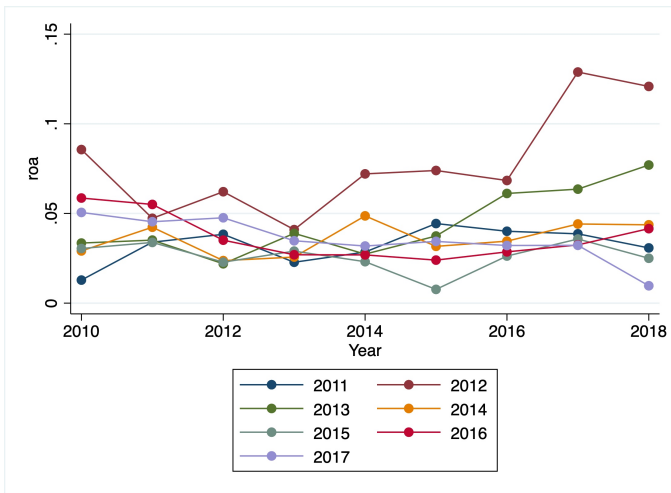
There are a few noticeable features from table 2. Firstly, the mean value of most outcome variables are higher for firms post-equitization than pre-equitization, with the exception of profit margin and solvency ratio. They are also higher than the mean value for non-equitized firms, with the exception of return on total assets. Secondly, the solvency ratio of equitized firms are higher than that of non-equitized firm, which might indicate that firms being chosen for equitization are those relying more on debt-funding. Lastly, there is a large discrepancy between the number of observations for equitized firms and non-equitized firms.

Inserted below are the trends of these variables, separated by groups of firms that equitize in different years:



(a) Trends of Log Profit for firms equitized in 2011 and 2013 (b) Trends of Log Profit for firms equitized in all other years

Figure 4: Trends of Log Profit



(a) Return on Asset

(b) Return on Equity

Figure 5: Other Profitability Measures

As we can see from figure 4<sup>2</sup>, besides 2011 and 2013, which have a clear increasing trend, log Profit of equitized firms have no consistent trends across the other years. The reason why 2011 and 2013 have this difference is because the largest national petrol production company is equitized in 2011, and the largest bank in Vietnam started equitizing in 2013. As these firms are already performing well and their scale is significantly above the rest of the firms, they might have been the driver for the large increase we observe. For the other years, the figure shows that firms generally improve in their profit after equitization, but the effect is only seen a few years after equitization happens, and is not obvious right after the equitization year.

We can also see that the observation we have for log Profit is also applicable when looking at other performance indicators. Return on assets shows that the trend is downwards pre-equitization, but a generally increasing post-equitization for firms within most year group, yet this trend is less clearly observed in return on equity, where there are large fluctuations for firms in 2012 and 2016.

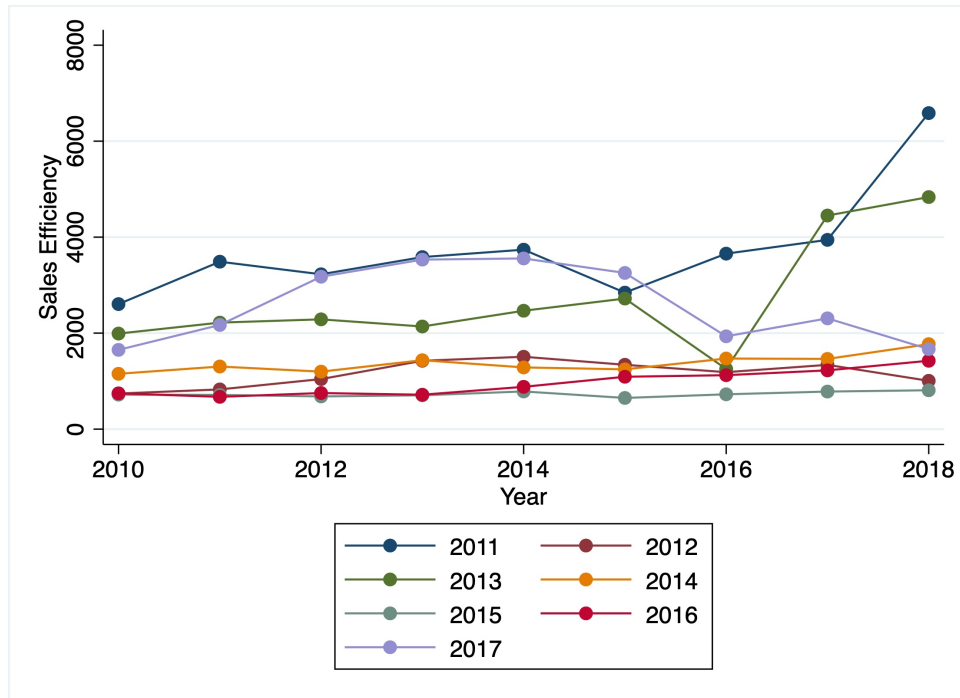


Figure 6: Sales Efficiency

Figure 6 shows the overall trends for sales efficiency and solvency ratio. While sales efficiency exhibit a generally positive trend, the difference throughout the years are not significantly large for most year groups. One noticeable point is in 2016, where

<sup>2</sup>The reason for separating into two graphs is that the trends for firms equitizing in 2011 and 2013 would imbalance the scale of the whole graph, making it difficult to see clearly the trends in other years

firms equitizing in different years all see a dip in sales efficiency. This might be due to the beginning of another five-year plan by the government, which forecasted a more challenging 5-year ahead that dulled the profits of firms.

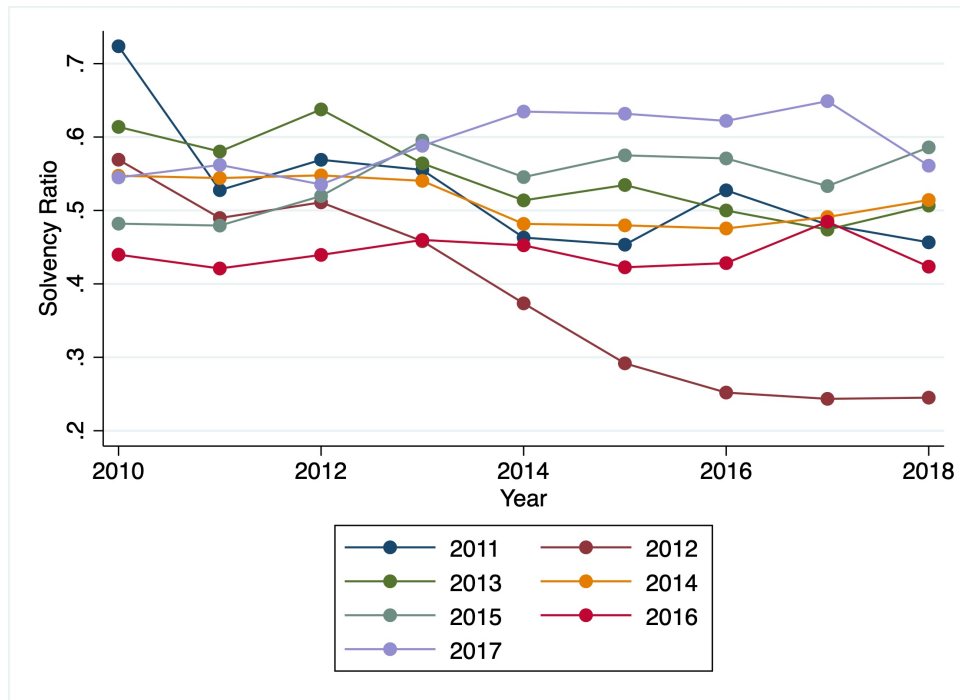


Figure 7: Operating Efficiency and Solvency Ratio Measures

However figure 7 shows that for solvency ratio, the trend is opposite from what we observed in other graphs. Firms in all groups tend to use less debt funding as time passes. It shows that firms tend to rely less on leverage and incurred lower liability after equitization occurs. However, all these figures are only looking at the equitizing firms without proper comparison. I will continue by talking about the empirical strategy on how I intend to compare changes from the equitizing firms with that of the control group.

## 5 Empirical Strategy

### 5.1 Limitations of Previous Empirical Approaches and Proposed Improvements

The empirical literature largely finds positive effects of equitization to performance measures of enterprises. Nevertheless, methodological limitations could be found of most of

the reviewed literature. For instance, the pre-post comparison technique using Wilcoxon test, despite its credibility for measuring the impact of privatization on corporate performance, fails to single out other concurrent effects on the performance, thus suffered from omitted variable bias. Furthermore, the choice of with-without comparison method (to compare equitized firms' performance with that of SOEs), or even the DID approach, suffers bias in sample selection. For instance, Loc and Tran (2016) found evidence that businesses included in the list for equitization are usually chosen not randomly but according to pre-determined criteria depending on the economic, political, and social objectives at each stage of development. This implies that there is selection bias, which would lead to inaccurate estimation of the true effect of equitization.

Tran et al. (2015) attempt to tackle this problem using propensity scores, but I argue that this still has not implemented the best treatment for the problem. The objective of PSM is to create matching groups of observations to artificially create an experiment as close to a complete randomization as possible. However, King and Nielsen (2019) discusses the limitations of PSM by pointing out its ineffectiveness in dealing with social experiments, where there is already information with regards to selection in the beginning. As such, when dealing with social experiments, other matching methods, which aims to create a fully blocked experiment setup, would provide a better and more complete information of the covariates and reduce the bias. This is particularly true for equitization process, as existing information implies that we can block firms into groups of similar characteristics based on criteria of choice from the government, and examine the effect of equitization within that group. This shows that PSM is subpar to other matching method that aims to create a fully blocked experiment.

I will contribute to the literature by improving on the methodology of the existing literature. As I have a panel dataset, my analysis will provide results that are representative for all firms equitizing in the same transformation phase. Exploiting features of the panel data, I will employ a staggered DID to conduct the DID to account for treatment being conducted at staggered periods of time. I will also provide event-study figures to showcase a more complete picture with firm's performance years after equitization takes place, rather than just limiting to two-period pre and post-equitization.

## 5.2 Methodology

The identification of the causal impact of equitization on firms' performance is challenging for various reasons. Firstly, there might be unobserved differences within each firm that

have an effect on their performance. Firms' culture would be an example of such category, since different culture might instill differing work ethics in its employee, which leads to differing labor efficiency. There will also be concern with unobserved differences between the differing economic environment that a firm was going through when it underwent equitization, such as an economic downturn in several years or economic boom in others.

To control for these unobserved variables that are time-invariant and time-specific, I will employ the two-way fixed effects model to estimate the treatment effect. The firm fixed-effects will account for any time-invariant difference in characteristics, while the time fixed-effects will account for any time-specific difference in conditions. Furthermore, I also explicitly controls for other factors that might be time-variant, such as firm size. To examine the equitization effect on firms' performance, I consider the following staggered difference-in-difference specification:

$$Perf_{it} = \beta * Equitized_{it} + \gamma_i + \lambda_t + \mu X_{it} + \epsilon_{it}$$

Where  $Perf_{it}$  is performance indicators of firm  $i$  at time  $t$ , such as return on asset or revenue efficiency of labor;  $\gamma_i$  and  $\lambda_t$  are firm fixed-effects and time fixed-effects respectively;  $Equitized_{it}$  is an indicator for whether a firm  $i$  is equitized at time  $t$  (which takes value of 0 for all observations of SOEs not being equitized in the period or pre-equitization observations of equitized firms, and value of 1 for post-equitization observations of equitized firms);  $X_{it}$  is a vector of control variables including firm age (*age*), firm size (proxied by *labor*) and firm sector (industry dummies clustered in the regression). DID estimators will be embedded in  $\beta$  coefficients which represent the performance changes in the post- privatization period for switchers, *ceteris paribus*. In other words,  $\beta$  captures the performance changes in post-equitized stage for equitized firms compared with their counterparts of control groups.

Secondly, it is clear that the timing for a firm to start equitizing is non-random because equitization is a national strategy. Given that the government has political and social agenda to focus on firms that are already performing well and ensure a more favorable outcome post-equitization, the improvement in performance will come from unobserved previous economic advantages instead of efficiency gain from equitization itself. The choice of firms to start equitizing is thus an inherent selection bias. I partially tackle with this issue in the robustness section by using early-period observations from later-period equitized firms as the control group for early-period equitized firms. Given that these firms are chosen in the same equitization phase, they share more similar characteristics with each other, thus reduce the bias in the result that is caused by

unobserved factors. This method is better than PSM because it is attempting to block the observations into groups that share the same characteristics as equitized firms are chosen because of having similar qualities that fit the government’s criteria.

Moreover, since the effect of equitization might not be immediate, it would be useful to see performance of firms for periods after they started equitizing. For this purpose, I run the following event study specification to show how different performance indicators vary for our treatment group:

$$Perf_{it} = \sum_{j=-7, j \neq -1}^7 \beta_j \mathbf{1}(\text{years since equitization occurs}) + \gamma_i + \lambda_t + \mu X_{it} + \epsilon_{it}$$

where  $j$  indicates the number of years since or before equitization. Each coefficient of  $\beta_j$  represents the effect of equitization that is limited to that year, with respect to equitization year, specifically. If equitized firms take longer to improve in performance, I expect to see the event study to show small changes in post-equitization years that are close to the switch period, but larger changes in later years.

## 6 Main Results

In this section, I present the effect of equitization on various performance measures of firms. Firstly, I will discuss findings using the two-way fixed effects staggered DID regression where I exploit variations in the timing of equitization. Second, I will present the results from the event studies on the various performance measures, to see the extended effect of equitization.

### 6.1 Two-way fixed effects regression

Table 3 presents the estimates on the effects of equitization on profitability measures. The regression results show a positive coefficient for all the outcome variables, but only the coefficient in front of log of Profit is significant at the 10% significance level . For the first mechanism, this shows that post-equitization firms are reaping higher profitability than the control group of non-equitized firms.

	(1)	(2)	(3)
	Log of Profit	Return on total assets	Return on equity
Equitized	0.00368* (0.00179)	0.0135 (0.0202)	1.440 (2.901)
N	23928	23928	23928
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes

Standard errors are clustered at the firm level

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 3: Two-way Fixed Effects Regression: Profitability Measures

This result shows that equitized firms on average enjoys a 0.368% higher profit level than non-equitized firms, 0.0135 units higher return on total assets and 144% higher return on equity. The profit level difference is rather small, due to possible reasons that equitization might take a longer time to show its effect as divested shares take time to be acquired by private investors. Moreover, the government would still retain much control of equitized firms, leading to economic decisions being more delayed.

The ROA result is consistent with studies from Tran et al. (2015) (3%) and Van Tan (2018) (0.2%). However, the coefficient ROE is much higher than results shown by these authors (8% and 12% respectively). The result also shows that these coefficients are nonetheless, not statistically significant, implying that there is no evidence to conclude whether profitability of equitized SOEs increase or not after equitization. The large deviation of the coefficient reflects the more complex nature of firms in the third wave, as subsidiaries, parent companies and economic enterprises are equitizing in the same time. The results of this study are consistent with findings from Van Tan (2018), which also concluded that there were no significant increase in profitability of firms equitizing in 2014, but are contrary to the study by Tran et al. (2015) who have suggested that after equitization, equitized enterprises significant increase in ROE and ROA. This difference can be explained as Tran et al. (2015) used data from the second wave of equitization, while Van Tan (2018) and this study used data from the third wave.

Table 4 presents the estimates on the effects of equitization on operating efficiency and leverage measures. Sales efficiency is measured in million VND per worker, and wages are in millions VND. The regression results show a positive coefficient in front of all outcome variables, but none of the coefficients are statistically significant. For the second and third mechanisms, this shows that it is unclear if post-equitization firms are reaping higher profitability than the control group of non-equitized firms, but they are



using more debt-funding.

	(1)	(2)	(3)
	Sales Efficiency of Labor	Total Wages Paid to Labor	Solvency ratio
Equitized	158.4 (288.6)	882.2 (3719.9)	0.537 (0.387)
N	23928	23928	23928
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes

Standard errors are clustered at the firm level

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 4: Two-way Fixed Effects Regression: Operating Efficiency and Leverage Measures

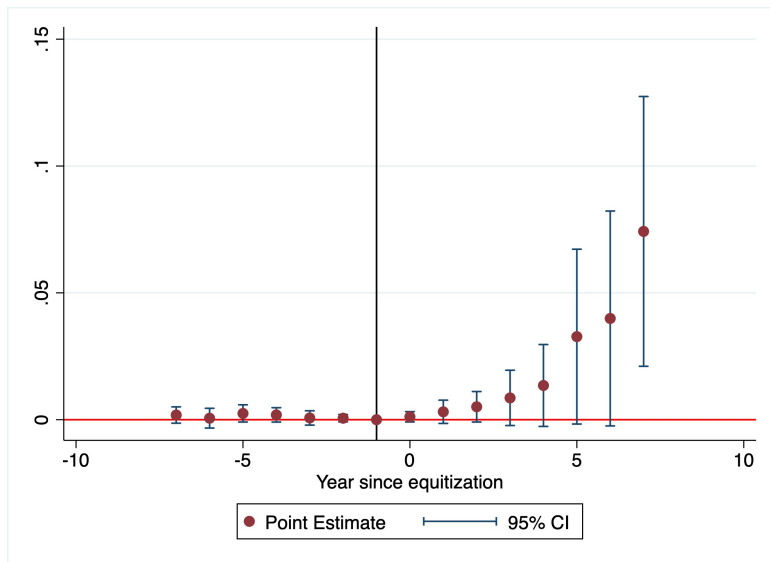
This result shows that equitized firms on average gains a 158.4 million VND more in sales per worker, but paid 882 million VND more for its labor in comparison to non-equitized firms. Thus this study does not conclusively confirm that firms have better operating efficiency after equitization. The result on sales efficiency from this study contradicts the findings from Van Tan (2018), who found that equitized firms in 2014 on average has 788.49 million VND less in sales per worker. The reason for this large discrepancy comes from this study's consideration of firms in the entire phase versus just firms in 2014. The standard errors for these two coefficients are really large as well, implying that there is not enough evidence to show an increase in labor efficiency after equitization.

For the third mechanism, the results indicate that solvency ratio of equitized firms are also 0.537 units higher than the non-equitized group, meaning that the liabilities of equitized firms takes up 53.7% higher proportion of its assets than non-equitized firms. This shows a different result from studies by Tran et al. (2015) and Van Tan (2018), which both shows that solvency ratio falls after equitization. This might be explained by the needs to use leverage and increase capital after equitization, as explored by Carlin and Pham (2009). This is especially true for firms in this equitization phase, as they consist mostly of economic enterprises that would have more usage for wider access to alternative private capital markets. However, the coefficient is also statistically insignificant, indicating that the result might be inconclusive to discuss leverage changes.

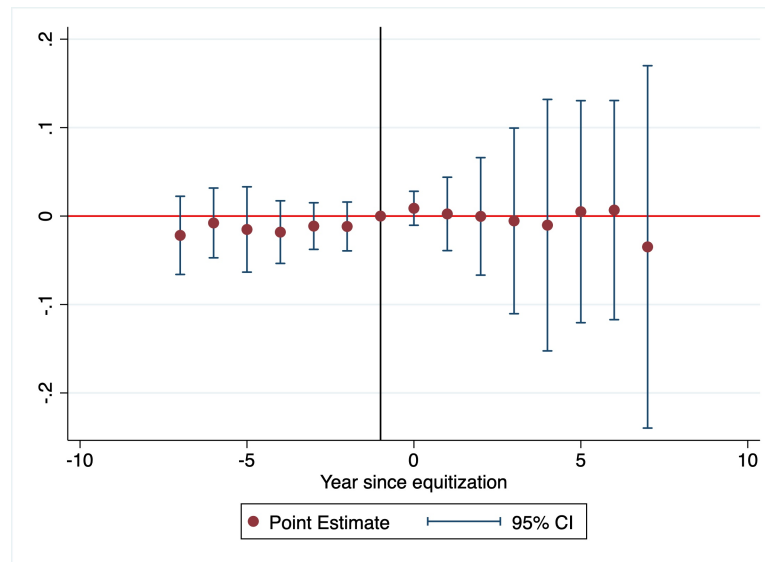
## 6.2 Event Study

Equitization might have dynamic effects on performance measures since it would take time for equitized firms to have full control over their decision-making process, as the government will still be holding on to some control of the firms, especially firms in this phase that are of great financial and economic importance. Moreover, market pressures can only become more visible with time, when most shares of the equitizing firm have been divested, thus managers will take time to realize their incentives to secure their positions and start making more economically sound decisions. The event study analysis provides evidence on the timing of when the equitization have significant effects on the outcomes of interest.

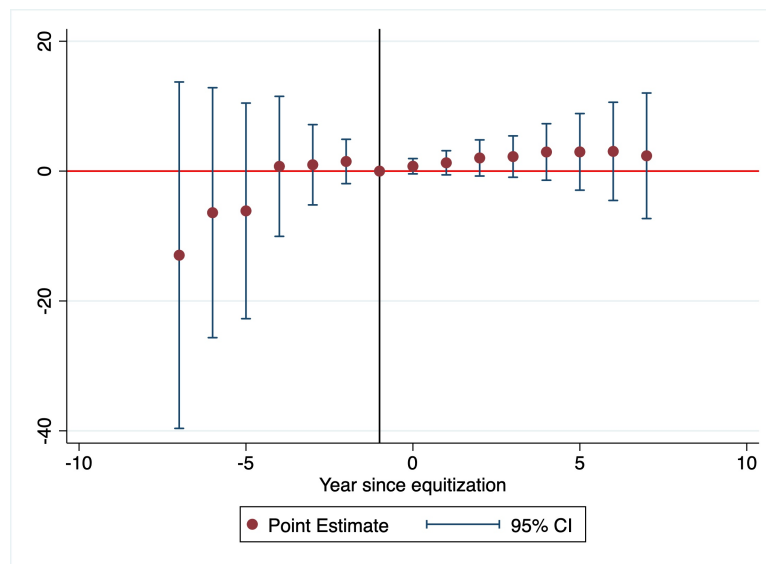
Figure 8 plots the coefficients from the regression of profitability measures on a set of dummy variables indicating the number of years since equitization. The event study results provide further evidence that the estimated effects of equitization are causal. Both figures 8(a) and 8(c) show that the effects of equitization on profitability improvements are dynamic. There is no immediate effect on log Profit or ROE but there is a gradual and persistent positive effect, with log Profit values increase very significantly in later years in comparison to estimates pre-equitization. On the other hand, there is an unclear relationship reflected in the event study for ROA, where we see the point estimates fluctuating above and below the reference point of 1 year pre-equitization. These results support the argument that equitization improves firms' performance but only after a long enough period of time has passed, and is consistent with the findings of Carlin and Pham (2009), who first proposed that the reason for the slow improvement in performance is because equitized enterprises face very substantial challenges in their first few years of operation, especially with aligning their economic objectives and removing political ones.



(a) Event Study for Log Profit



(b) Event Study for Return on Asset



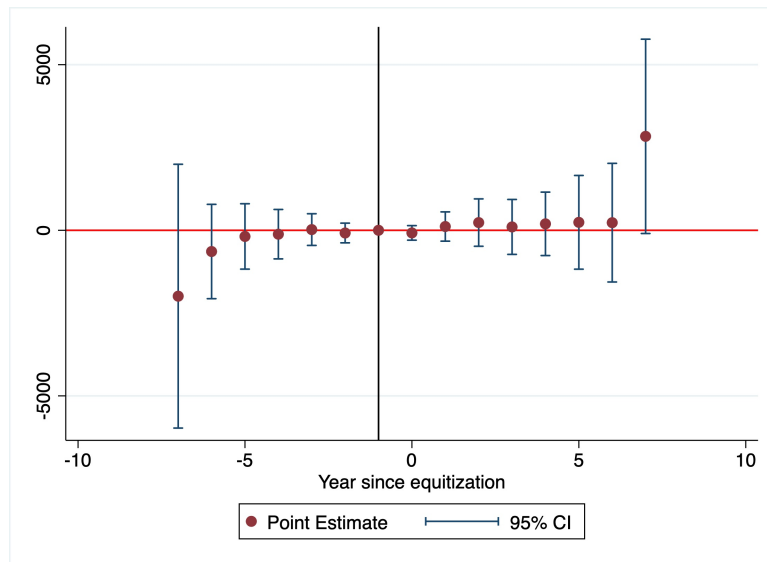
(c) Event Study for Return on Equity

Figure 8: Event Studies for Profitability Measures

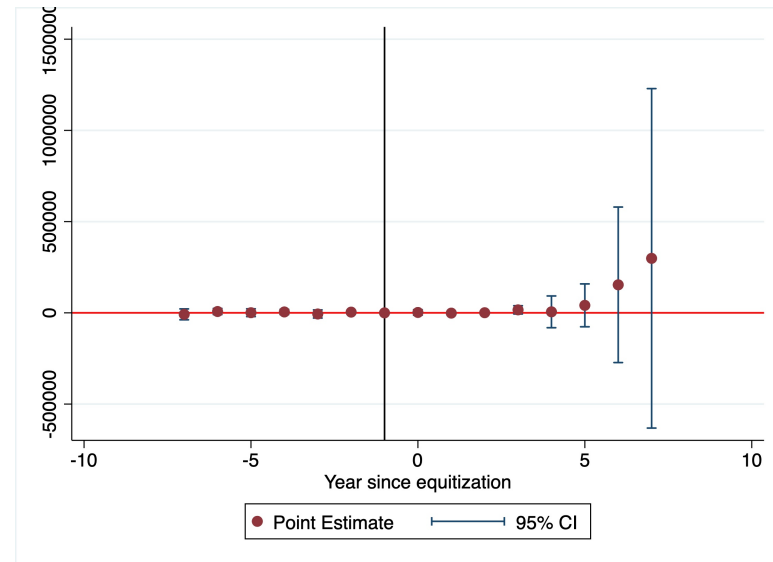
Figure 9(a) and 9(b) plot the coefficients from the regression of operating efficiency measures on a set of dummy variables indicating the number of years since equitization. The results indicate an unclear relationship between equitization and efficiency measures. While sales efficiency estimate increases moderately with further periods from equitization, so did wages paid to labor. This supports the hypothesis that firms will employ more productive labors which bring more sales to the company, and while wages will not rise initially, after a period of time, the workers will realize the increase in performance they bring to the company and demand higher wages.

Figure 9(c) plots the coefficients from the regression of solvency ratio on a set of dummy variables indicating the number of years since equitization. Similar to profitability, the effects of equitization on leverage usage are dynamic. There is no immediate effect on solvency ratio but there is a clear increase on debt-usage after 3 years of equitization. This might be explained by equitizing firms being increasingly accustomed to the private capital markets, and the 3-year mark would be the point at which their cost of borrowing is lowered when the market has recognized them as a private firm, allowing them to borrow more.

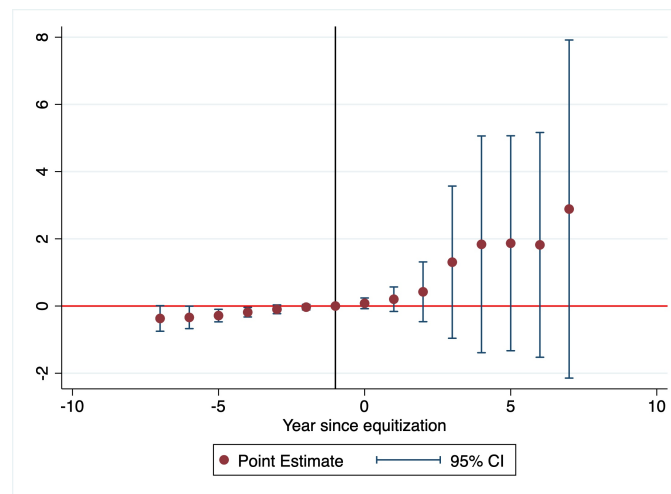
However, it is also important to note the large confidence intervals for the point estimates at periods further away from the equitizing year. In all figures, the intervals are fairly small closer to the equitizing year, but span a much larger range in periods from 3 years after the event onwards, or 4 years before and earlier for the ROE figure. This can be due to two reasons: the relatively small intervals close to equitization year should be understandable because most firms equitizing from 2011 to 2017 will have more complete information within one or two years of the switch, meaning there are more observations available. Conversely, at periods further away from the switch year in either time direction, there are only a few firms that would have such information: for example, for periods larger than 5 years after the switch year, only firms switching in 2013 or earlier would have any observations. As seen from figure 1 above, the most number of firms equitizing are from 2013 to 2016, so the effect that we see from the event study might be more heavily influenced by observations from firms equitizing in these years.



(a) Event Study for Sales Efficiency



(b) Event Study for Total Wages



(c) Event Study for Solvency Ratio

Figure 9: Event Studies for Efficiency and Leverage Measures

## 7 Robustness Check

### 7.1 Additional selection bias control:

In order to examine the sensitivity of the results to additional robustness checks that limit the extent of the selection bias, I limit the regression to include only observation from firms that are equitized. Essentially, observations from firms that equitize later can be used as the control group to compare with firms that equitize earlier. For example, let's say firm A equitized in 2012, but firm B would equitize only in 2016. The observations from 2012 to 2015 of firm B can serve as the control group to compare the impact of the switch of firm A. The difference between this and the initial two ways fixed effect is that here the control groups are only the firms that will be treated in the future. The results are as followed:

	(1)	(2)	(3)
	Log of Profit	Return on total assets	Return on equity
Equitized	-0.00127 (0.00271)	0.00671 (0.00932)	-0.00208 (0.0247)
N	2771	2771	2771
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes

Standard errors are clustered at the firm level  
\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

	(1)	(2)	(3)
	Sales Efficiency of Labor	Total Wages Paid to Labor	Solvency ratio
Equitized	-153.6 (117.0)	-21526.6 (30355.2)	-0.0138 (0.0237)
N	2771	2771	2771
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes

Standard errors are clustered at the firm level  
\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 5: Regression with Pre-Equitization Observations as Control Group

Table 5 shows that the coefficient for log Profit, ROE, both operating efficiency measures and solvency ratio turn negative, which might indicate that firms actually performed worse in terms of profitability, make use of less labor and more inefficient labor, and use less debt funding after being equitized, if we limit the control to only observations pre-equitization. However, these coefficients are all statistically insignificant, which could be because the number of observations available dropped significantly (from more than 24000 as seen in Table 1 to only about 2771 in Table 2) when we limit the control group as discussed. The

significant loss of power due to losing observations have caused our coefficients to change drastically from the initial staggered DID design, when I try to control for selection bias.

## 7.2 Alternative transformation for Profit values

As explained above, since some firms have negative observations of profit, to calculate the log transformation I have to add the absolute of the minimum value from the observations to make all profit values positive as log transformation do not accomodate negative values. This log transformation causes bias because values that were close to 0 were shifted more positively. To tackle this problem, I will use the inverse hyperbolic sine transformation, which is defined at 0, to see if the results change:

	(1)	(2)
	Log of Profit	Inverse Hyperbolic Transformation of Profit
Equitized	0.00368*	-0.0629
	(0.00179)	(0.224)
N	23928	23928
Firm fixed effects	yes	yes
Year fixed effects	yes	yes

Standard errors are clustered at the firm level

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 6: Regression Using Inverse Hyperbolic Transformation

Table 6 shows the comparison between the log transformation and the inverse hyperbolic transformation. The results under the usage of the inverse hyperbolic sine transformation shows a negative coefficient for profit, implying that if we consider using this transformation, firms actually gain 6% less profit after equitization in comparison to our control group. However, since the results became statistically insignificant, this relationship is not conclusive.

## 7.3 Control for age and labor size:

Other issues that are not related to equitization might affect performance of firms after equitization, thus confounding the effect that we should observe. Firstly, firms' size would affect operational and economic efficiency of firms in different ways: while larger firms are reap more economies of scale and lower cost, they also incur cost in terms of operational inefficiency or managerial cost. Since equitizing firms go through lots of asset sales and size

changes, these changes will not be consistent or time-specific to be captured in our fixed effects. Secondly, firms' age would also indicate how performance might differ between each enterprise. Older firms tend to be more static and impervious to change as they are already used to a structure of operation, making them more difficult to adapt to a private sector's managerial style, while newer ones tend to be more adaptive to changes. This is especially true for SOEs in Vietnam as older firms tend to have connection to and great support from the government, making them likely to be more inefficient. As such, introducing controls for these two factors might improve the statistical significance of the results:

	(1)	(2)	(3)
	Log of Profit	Return on total assets	Return on equity
Equitized	0.00376*	0.0120	1.555
	(0.00182)	(0.0205)	(2.862)
N	23205	23205	23205
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Control for age	yes	yes	yes
Control for labor size	yes	yes	yes

Standard errors are clustered at the firm level

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

	(1)	(2)	(3)
	Sales Efficiency of Labor	Total Wages Paid to Labor	Solvency ratio
Equitized	146.4	3540.2	0.559
	(331.2)	(4469.5)	(0.403)
N	23205	23205	23205
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Control for age	yes	yes	yes
Control for labor size	yes	yes	yes

Standard errors are clustered at the firm level

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 7: Regression With Additional Controls

After we introduce the control for labor and age, the coefficients from table 7 in front of our outcome variable does not change significantly, and we also did not get a more statistically significant result, even though the coefficient for log of Profit is still statistically significant at 10% level. This is different from the results from Loc et al. (2006), which stated that larger firms have a higher efficiency increase after equitization than smaller ones. This might have come about because of the different method of empirical methodology: Loc et al. (2006) used a pre-post comparison method, while this study used a regression and compare between firms with and without equitization.



## 7.4 Limit to full-panel data:

During the handling process of the data, I notice that there are some firms with incomplete observations. These are either because they stopped operating (either due to acquisition or shutdown) or because they stopped reporting when they made the switch to private firms. The latter issue presents a threat to the specification because I will be missing out on information on firms that eventually became fully private. As such, I decide to limit the data to include only firms with full-panel observations, and apply the specification onto them.

	(1)	(2)	(3)
	Log of Profit	Return on total assets	Return on equity
Equitized	0.00319 (0.00187)	-0.000167 (0.0180)	3.507 (4.085)
N	12717	12717	12717
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes

Standard errors are clustered at the firm level  
\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

	(1)	(2)	(3)
	Sales Efficiency of Labor	Total Wages Paid to Labor	Solvency ratio
Equitized	51.76 (247.8)	3231.5 (8724.8)	0.507 (0.386)
N	12717	12717	12717
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes

Standard errors are clustered at the firm level  
\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 8: Regression Limited to Full-Panel Observations

Table 8 shows the coefficients we can see that all the coefficients in front of our predicted variables are statistically insignificant. This might be because of a loss of power, due to losing observations (as we can see that the available data is halved.)

## 7.5 Introduce Percentage Private Ownership

The literature informs us that the percentage ownership of the private sector on equitizing firms will affect the extent to which equitization improves performance. Moreover, from the managerial perspective, managers in equitizing firms will be more exposed to market forces, which provide them the incentive to make more economically sound decisions and improve

firms' performance. This effect will also increase if more information of the firm is correctly reflected in the market, which only happens with increasing share of firms being owned by the private sector. As such, I will modify the basic staggered difference-in-difference specification to include an interaction term between ownership and private share control:

$$Perf_{it} = \alpha Equitized_{it} X Private_{it} + \beta Equitized_{it} + \gamma_i + \lambda_t + \mu X_{it} + \epsilon_{it}$$

Where  $Private_{it} X Equitized_{it}$  is the interaction term between private share ownership and equitization dummy and  $\alpha$  is the coefficient that captures the effect of private share ownership. The inclusion of  $Equitized_{it}$  is to account for effect of being equitized. Table 9 provides the results for this regression:

	(1)	(2)	(3)
	Log of Profit	Return on total assets	Return on equity
Equitized*Private	-0.0000561 (0.0000369)	0.000183 (0.000234)	-0.00408 (0.00519)
Equitized	0.00614 (0.00361)	-0.00384 (0.0336)	2.874 (3.285)
N	21081	21081	21081
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Standard errors are clustered at the firm level			
* $p < .10$ , ** $p < .05$ , *** $p < .01$			
	(1)	(2)	(3)
	Sales Efficiency of Labor	Total Wages Paid to Labor	Solvency ratio
Equitized*Private	-5.039* (2.544)	-134.4 (260.1)	-0.00351 (0.00338)
Equitized	364.9 (373.0)	7773.3 (15764.9)	0.665 (0.500)
N	21081	21081	21081
Firm fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Standard errors are clustered at the firm level			
* $p < .10$ , ** $p < .05$ , *** $p < .01$			

Table 9: Regression with Private Share Interaction

Interestingly, table 9 shows us that with 1% increase in private share ownership, log of Profit, ROE, Sales Efficiency, Total Wages and Solvency Ratio all decrease, but only the coefficient in front of sales efficiency is significant at 10% significance level. This indicates that firms with higher private ownership perform worse in terms of profitability and sales

efficiency, but rely on less debt-funding. This can be understood from our sample that contains many enterprises in "natural monopoly" type of industries, which benefit more to remain state-owned rather than become private.

## 8 Conclusion

This study employed the staggered difference-in-difference design, which compares the performance of switched firms group with those that did not. Previous studies in the field mainly use pre-post comparison method Loc et al. (2006) or with-without comparison method with propensity scores like Tran et al. (2015) and Van Tan (2018). Specifically, they both apply PSM in order to establish comparable groups between the control and the treatment groups in an attempt to alleviate problems of selection bias. However, according to King and Nielsen (2019), PSM often accomplishes the opposite of its intended goal, thus increasing imbalance, inefficiency, model dependence, and bias. As a solution to the problem of PSM, I use a two way fixed effects estimator which exploits the staggered nature of equitization where the control groups are the observations from equitized firms in earlier periods, which would serve as a better way to treat selection bias since these firms were subjected under the same choice criteria. I found that with this control, the coefficients of most measures become negative, which is opposite to the results from the original specification.

The two-way fixed effects regression shows that the profitability of the enterprises after equitization (ROE and ROA) increased but is not statistically significant. Furthermore, equitized SOEs actually used more debt after equitization, which is opposite to results from Van Tan (2018) and Loc and Tran (2016), as firms are more likely to use less debt, but instead use other sources such as stock issuance for lower capital expense. The results are not consistent with previous studies by Loc et al. (2006), Tran et al. (2015), Loc and Tran (2016), Hung et al. (2017), Nhan and Son (2017). However, the results of this study coincide with the study by Estrin and Perotin (1991) when there is no privatization effect on the firm of privatized enterprises. Cuervo and Villalonga (2000) argue that privatization and ownership are not the main determinants of firm performance of SOEs after privatization. The empirical results of equitization in Vietnam in this study also show that privatization-related theories can not always explain firm performance after equitization, because of the complexity of equitization, particularly aspects of government's existing control in the firms post-equitization. Furthermore, given the nature of firms being equitized in the third stage being more structurally and financially complicated, a clear cut result should not be expected.

Nonetheless, the event study gave a better understanding of firms' performance variation with time. As previously suggested by the literature Loc et al. (2006) and Tran et al. (2015), firms after equitization might require some period of time before the effect of equitization is best understood. As such, using panel data, this study generated event studies that show profitability improvements for firms after a few years, while the effects on efficiency is unclear and on solvency ratio is higher. Thus, this study adds on to the literature by showcasing the dynamic effects of equitization and performance measures.

The research also offers some understanding to why enterprises sometimes do not want to participate in equitization in Vietnam as equitization does not always help enterprises to increase their efficiency if considered in relation with non-equitized SOEs. According to Van Tan (2018), the third phase progress of equitization in Vietnam (from 2008 up to now) has slowed down, one of the reasons is that investors are cautious about the IPO, they are suspicious about the firm performance after equitization in Vietnam. This study shows that this concern is valid, as increase in privately-owned shares are shown to reduce profitability and sales efficiency for equitized firms. Furthermore, recent literature (such as Baker and Wang (2021)) has shown that staggered DID estimates tend to provide unequal weights to observations by overweighting observations closer to the beginning and the end of the treated period. This issue is particularly important to this research because most firms in my data come from the middle period (2014 - 2016), so bias towards fewer firms earlier and later than that period expectedly create imbalance and incorrect estimations. Therefore, the author suggests that further studies should consider the impact of these factors along with the impact of equitization on firm performance after equitization in Vietnam and after privatization in other countries.

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