

Equitization and its Impact on Firm Performance in a Transition Economy

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Abstract

This study examines the importance related theories explaining the impact of privatization on firm performance after privatization, from which the author outlines the possibility of applying these theories to explain firm performance after equitization in Vietnam. In addition, this study provides an overview of equitization progress in Vietnam as well as an overview of the methods used to assess the impact of privatization on firm performance after privatization which can be applicable to the case of equitization in Vietnam. Through the quantitative approach with the application of propensity score matching and differences-in-differences techniques, the study proposes a new method though regression models for assessing the impact of equitization on firm performance of equitized state own enterprises in Vietnam. The results of the study show that previous studies still have several limitations in methods to assess the impact of privatization on firm performance after privatization. In addition, the results of the study show that equitisation does not always have positive impact on firm performance of equitized state-owned enterprises after equitization in Vietnam.

Keywords: Equitization, privatization, firm performance, IPO

JEL Classification: G34

1. Introduction

According to the global trend, privatization is an inevitable process and has a positive effect on firm performance after privatization. Privatization has many positive aspects such as: (i) increasing economic efficiency; (ii) helping to reduce budget deficits (directly related to financial inefficiencies); (iii) improving the public finance system for SOEs. Some theories concerning privatization also suggest that the privatization process is indispensable and should be widely applied in countries, especially in developing countries. In Vietnam, the term “equitization” is used more often than “privatization”. Because equitization in Vietnam has many characteristics of the firm ownership structure after equitization, equitization does not mean that the State sells all of its assets to private sector but still holds a portion of shares, especially for some enterprises in essential industries, the State still has to hold a great number of shares, such as energy, telecommunication, etc.

According to the Vietnamese Steering Committee for Enterprise Renovation and Development (2017), equitization of enterprises in Vietnam was conducted in the early 1990s with the first pilot stage of 558 equitized enterprises, the following stage was to promote the equitization process (between 1998-2011) including 3,021 equitized enterprises, the third stage was to restructure SOEs (from 2012 up to present) but the number of equitized enterprises has also declined considerably so far. This can be explained that small and medium size SOEs were equitized in the first and second stage

while the majority of SOEs and large corporations were not equitized. In addition to the above reasons, what other reasons lead to postpone the equitization process of state-owned enterprises and corporations in Vietnam? In order to answer the above question, it is necessary to determine whether equitized SOEs are performing well compared to non-equitized SOEs in the same period.

The slow privatization progress of SOEs is also due to the fact that most private investors have not been attracted in IPO investment, and investors have always questioned whether state-owned enterprises operate more efficiently after privatization or not. And private investors don't know whether equitized SOEs will be listed on the stock exchange or not because the number of state-owned enterprises listed on the stock exchange is very limited in Vietnam. Investors want to receive high initial abnormal returns for the first listing days. There were a great number of equitized SOEs during the stage of 2003-2006 (with 2,649 equitized enterprises, accounting for 66.3% of the total equitized enterprises up to September 2017) and this stage was called the "explosion" stage of equitization with a very high average number of equitized enterprises per year. In particular, there have been no empirical studies to explain why after the "explosion" stage of equitization, private investors were not interested in IPO, and they have been more serious in IPO investment in recent years.

Therefore, measuring the impact of equitization on firm performance of enterprises has attracted the interest and research from many domestic and foreign scholars. These studies only focus on privatization of SOEs and can be classified into three categories: (i) Earlier studies adopting pre-post comparison method to measuring the impact of privatization on firm performance of equitized enterprises, pioneered by Megginson et al., (1994). The authors compare mean values of each financial measure for 3 year privatization windows. (ii) earlier studies adopting with-without comparison method, and typical researchers using this approach are Pohl et al., (1997), Frydman et al., (1999), Claessens and Djankov (2002). These studies evaluate the effect of privatization on firm performance by contrasting performance of those after privatization with non-privatized ones in the same periods; (iii) studies using regression method to measure causality to analyze the impact of firm ownership on firm performance after privatization (Boubakri et al., 2004; Boubakri & Cosset, 1998; Claessens & Djankov, 2002; Zhang et al., 2012). In addition, some other studies use macroeconomic and macroeconomic factors that affect firm performance after privatization. In Vietnam, many authors evaluated the impact of privatization on firm performance using all three methods. The pre-post comparison method was used by Pham (2017), Hung et al., (2017), Loc et al., (2006), Loc and Tran (2016) use with-without comparison method. Some researchers use regression method to identify factors impacting on performance of equitized enterprises (Hung et al., 2017; Loc et al., 2006; Tran, Nonneman, & Jorissen, 2015). However, domestic and foreign studies mainly tested the difference in mean and median values of firm performance measures. Previous studies have not identified uniformity among equitized firms and non-equitized firms to compare firm performance, most of previous researchers used cross-sectional data approach and have not applied new methods in evaluating the impact of equitization on firm performance of privatized SOEs, namely the combination of PSM (propensity score matching) and DD estimation (difference-in-differences estimation).

Although empirical studies use the same methods, they still have inconsistent results. Many authors argue that privatization is not a good choice for governments when they like to improve SOEs performance. Other studies have shown that privatization is a good choice for many countries, not only in developed countries but also in developing countries. An unanswered question is whether privatization theories fully explain firm performance after privatization or not. And do suitable methods will help to explain the impact of privatization on firm performance?. These two unanswered questions are still in research debate until now because no empirical studies have used related privatization theories explaining the impact of privatization on firm performance. Furthermore, not many empirical studies have applied methods with certain limitations. This study is to figure out these limitations and also proposes a new approach to assess the impact of equitization on firm performance in Vietnam.

This research is organized in 7 parts, including: (1) Introduction; (2) Background of Vietnamese Equitization; (3) Related Theories and Hypothesis Development; (4) Methodology Limitations of Previous Studies; (5) Data and Research Methodology; (6) The Empirical Results and (7) Summary and Concluding Remarks.

2. Background of Vietnamese Equitization

2.1 The History of Privatization Programs

Megginson et al., (1994) have summarized the history of privatization programs in developed and developing countries from 1961 to 1990. The first large-scale privatization was conducted in the Federal Republic of Germany (FRG) in 1957, under the government of Konrad Adenauer. According to Waterhouse (1989), Specific objectives of privatization program in Germany are very similar to those of the United Kingdom. These objectives are 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; and (6) expose SOEs to market discipline.

The new Thatcher government first conducted privatization program in the early 1980s. In 1984, British Telecom (BT) was the first company to be privatized in the U.K and privatization was conducted in many countries. After privatization of British Telecom, many governments conducted their own privatization programs. The U.S government also conducted privatization in the late 1980s. After 1987, privatization programs spread considerably around the world, including developing countries in South America, Africa, and South Asia. Some countries conducted their privatization during this time are Bangladesh, Brazil, Chile, Gambia, Malaysia, Mexico, Nigeria, Singapore, and Venezuela. In the decade of the 1990s, privatization program shifted to Eastern Europe and the former Soviet Union.

China have implemented "economic reform" policy in 1978. Privatization has been considered as an economic reform policy in China. Up to now, many developing countries have not fully finished their privatization or equitization programs, including China, Vietnam, Myanmar, etc.

2.2 The Equitization Progress in Vietnam

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 have tended to privatize enterprises for which the private sector has an obvious comparative advantage. In the transitional stage, the privatization program includes certain important enterprises, which, despite a considerable amount of government subsidy or tariff protection, have performed 'inefficiently'. For the transformation stage from a still basically mixed economy to a near pure capitalist economy, there is privatization of the strategic enterprises. In Vietnam, the equitization progress is classified into three stages, including pilot stage (traditional stage), "explosion" stage (transition stage) and the third stage (transformation stage). Odle (1993) proposes stages theory approach to explain privatization progress.

In the first stage (from 1992-2000), 558 enterprises were equitized. In this stage, the progress was slow because there was no Law of Enterprises at that time, The pilot stage was from 1992 to early 1996. The selected enterprises for equitization were medium-and small-sized ones. The pilot equitization stage was under Decision No. 202/CT issued on 8th June 1992 and Direction No. 84 issued on 4th Aug 1993, this stage lasted for 04 years but the number of equitized enterprises was only 5 consisting of 3 central enterprises and 2 local enterprises. This stage was extended from 1996 to early 1998 when the Government issuing Decree No. 28/CP issued on 7th May 1996, that was the first time the Vietnamese Government issued the systematically applicable Decree to give SOEs instructions about purposes of equitization, criteria of SOEs selection, privatization methods, employment incentives and investment incentives for equitized enterprises. As a result, the

equitization rate has increased more rapidly, resulting in the transfer of 25 state-owned enterprises into joint stock ones, five time faster than the pilot stage. The size equitized enterprises were larger. The stage from 1998 to 2000 was the stage of accelerated growth, resulting 528 equitized enterprises.

Table 1: Numbers of equitized SOEs to 1990 up to September, 2017

No.	Time	No. of equitized enterprises	No. of equitized enterprises per year	Percentage	Legal Bases
1	1992-2000	558	65.3	13.2	Decision No. 202/CT issued on 8 th June 1992; Direction No. 84/TTg issued on 4 th Aug 1993; Decree No. 28/ ND-CP issued on 7th May 1996; Decree No.25/ ND-CP issued on 26 th March 1997; Decree No. 44/ ND-CP issued on 29 th June 1998.
2	2001-2002	253	126.5	6.0	
3	2003	622	622	14.7	Decree No.64/ ND-CP issued on 19 th June 2002
4	2004	856	856	20.3	Decree No.187/ ND-CP issued on 16 th November 2004;
5	2005	813	813	19.3	
6	2006	359	359	8.5	Decree No.109/ ND-CP issued on 26 th June 2007
7	2007	118	118	2.8	
8	2008-2010	105	35	2.5	
9	2011	60	60	0.4	Decision No.929/QD-TTg issued on 17 th July 2012;
10	2012	13	13	0.3	Decree No.59/ND-CP issued on18 th July 2011;
11	2013	66	66	1.6	Decree No.189/ND-CP issued on 20 th November 2013
12	2014	143	143	3.4	
13	2015	213	213	5.0	Decree No.116/ND-CP issued on 11 th November 2015
14	2016	55	55	1.3	
15	2017	37	37	0.8	Decision No. 1232/QD-TTg issued on 17 th August 2017
Total		4,271		100	

Source: Adapted from Report of the Steering Committee for Renovation and Development, Vietnam (2017)

In the second stage (from 2001 to 2007), there were 3,021 equitized enterprises, accounting for 70.73% of total number of equitized enterprises, especially the stage 2003-2006 (with 2,650 equitized enterprises, accounting for 62.04% of the total) was called the "explosion" stage of equitization with a very high average number of equitized enterprises per year and this reflects 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 third stage (from 2008 up to now), the equitization progress has been slow. In four years from 2008 to 2011, there were only 165 equitized enterprises, nearly equivalent to the number of equitized enterprises in 2007 and many times lower than in previous years. From 2011 to 2013, there were only 139 equitized enterprises (60 enterprises in 2011, 13 enterprises in 2012, 66 enterprises in 2013). Those were mostly large scale enterprises with wide range of branches and financial structure complexity. Notably, according to the report of the Steering Committee for Renovation and Development and there were 143 equitized enterprises in 2014.

In general, the equitization of state-owned enterprises from 1992 to date has achieved certain results, the total number of equitized enterprises by the end of 2013 was 3,823 (including state-owned agricultural and forestry farms). As a result, SOEs are more concentrated in the important sectors that the state holds. However, if compared with the equitization plan, the equitization process of SOEs is generally slow. From 2001 to 2010, the number of equitized enterprises has just reached 1/3 of the plan. According to the Scheme on restructuring SOEs in the 2011-2015 stage, the number of equitized enterprises would be 531 but the new equitized enterprises was only 139 in the stage of 2011 – 2013 and accounted for only 26.17% of the plan. In 2014, the situation has shifted more optimistically,

there were 143 equitized enterprises in 2014 and the number of equitized enterprises were 213 in 2015. From 2016 up to present, the number of equitized enterprises was limited. There were only 55 equitized enterprises in 2016 while the equitization plan for the stage of 2016 to 2020 would reach 240 enterprises. The equitized enterprises from 2008 to present were mainly large SOEs and managed by different Ministries. In this stage, the equitization progress has been slow due to a number of main reasons:

First, 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.

Second, after more than 15 years of equitization, the remaining SOEs in the equitization list are medium and large scale ones. The equitization of large scale 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. In addition, other important reasons were the economic crisis and the volatile stock market in 2008 which affected the SOEs equitization process in Vietnam.

3. Related Theories and Hypothesis Development

Researchers have made great effort in proposing theories to explain the role of equitization in firm performance of SOEs. In 1776, Smith proposed the "Invisible Hand" economic theory that: In a market economy, individuals want to maximize their profits. 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; He concluded that the wealth of each nation 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.

From the 1930s of the twentieth century, capitalism developed with highly developed productive forces demanding state intervention for economic regulation. The Kenneys school proposed the Keynesian theory on the role of government in the economy of a country. The state must maintain its investment to stimulate both 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). From the 1960s-1970s, PA Samuelson proposed the theory of mixed economy to overcome the limitations of invisible hand theory and the Keynesian theory on the role of government in the economy of a country. "Mixed economy" is the combined economy in which there are enterprises with private ownership and state ownership, and they are affected by the market mechanism as well as the state regulations (Keynes, 2016)

In addition, today's economists still argue which theories explain the role of the state regulating the economy suitably. The unanswered questions is that the government should privatize all SOEs or keep some key enterprises? Some economists argue that the State should only retain a number of key economic enterprises to regulate the economy. Therefore, these economists have encouraged the equitization process in countries, especially in developing countries. Some theories supporting privatization or equitization including public choice theory, property rights theory, agency theory, stakeholder theory and theory of competitive advantage.

Tullock and Buchanan (1972) propose public choice theory to explain the benefits of privatization. This theory explained that politicians consider state-owned enterprises as tools to assert their role and benefit them. This theoretical focus emphasizes performance of SOEs when it explained that SOEs are more inefficient because politicians only aim to orientate state-owned enterprises to increase their power without considering performance of SOEs (Tullock & Buchanan, 1972). The

theory also assumes that state-owned enterprises aim to maximize budgets, disperse risks, maximize labor and investment rather than maximize profits. Megginson et al., (1994) argues that if state-owned enterprises were privatized, there would be significant increase in profitability, real sales, capital expenditure, operating efficiency and work forces while lowering their debt levels and increase dividend payout. Freeman and Reed (1983) proposed the stakeholder theory to explain corporate behavior and operation. The theory explains manager's points of view, and managers first consider their benefits in business. Stakeholder theory also explain that there are multiple parties getting involved in the benefits of a business, including employees, customers, suppliers, financial service providers, the community, state agencies, political groups, trade associations and trade unions. In some cases, competitors may be considered as a related party but it is necessary to separate the competitors as they affect the business and other stakeholders. This theory explains that when stakeholders' interests are properly considered and the goals of each stakeholder are aligned, they will help enterprises to perform better. This theory also argues that the main objective of SOEs is not to maximize profits but to be governed by other social and security objectives. Once enterprises are privatized, the goal of the private enterprise is to maximize profits, cut costs, accelerate innovation and focus more on research and development. According to a study by Megginson et al., (1994), Boubakri and Cosset (1998), there are 79-86% of firms reaching an increase in labor productivity after privatization. These studies also suggest that private ownership is more effective because managers and private business owners are free to make decisions and their decisions are not driven by political interference (Shleifer & Vishny, 1994). However, Estrin and Perotin (1991) study the relationship between business ownership and business performance in the UK and France. The difference in performance of private enterprises and SOEs is due to different operational objectives and management mechanisms. The authors affirm that there is no privatization effect on firm performance of equitized enterprises. Cuervo and Villalonga (2000) argue that privatization and ownership are not the main determinants of firm performance of SOEs after privatization. The authors develop one model to explain the variability in firm performance of enterprises after privatization. Empirical results show that privatization and contextual factors (privatization methods, prior restructuring, deregulation) help to change in governance, ownership structure. After that, the post-privatized enterprises will change their operating goals, incentives, and control. Next, enterprises will change their operational strategies, organizational structure, and organizational culture. As a result, firm performance of privatized enterprises ultimately change and the variations have to be explained through a process like this. However, many empirical studies show that privatization can help privatized SOEs operate more efficiently in term of profitability. Hence, the first hypothesis will be:

Hypothesis 1: A shift from state to private ownership is likely to lead to an improvement of profitability.

There are some empirical studies suggesting that privatization really affects firm performance of privatized enterprises. Megginson et al., (1994) argue that privatized enterprises have an increase in real sales, become more profitable, increase their capital investment spending, improve their operating efficiency, and increase their work forces. Furthermore, these companies significantly lower their debt levels and increase dividend payout. Consistent with the above results, Boubakri and Cosset (1998), D'Souza and Megginson (1999) also prove that there is a significant improvement in financial and operating performance of privatized enterprises after privatization in developing countries. La Porta and Lopez-de-Silanes (1999) study the case of Mexico and also affirm that enterprises have a greater improvement in profitability and employee income after be privatized, or Harper (2002) also argues that privatization helps enterprises to be more efficient in terms of profitability and capital utilization after privatization. Loc et al., (2006) argues that there is an increase in firm performance after privatization, especially operating efficiency.

Hypothesis 2: A shift from state to private ownership is likely to lead to an improvement of Operating efficiency.

D'Souza and Megginson (1999) also find that the total number of employees of firms doesn't change much after privatization, whereas previous studies have suggested significant reduction in the number of employees after privatization. This study provides a comprehensive picture of how privatization benefits firm performance after privatization and compare between privatized enterprises in both developed and developing countries. However, Megginson et al., (1994), Boubakri and Cosset (1998) argues that number of employees in privatized SOEs increases considerably after privatization because privatized SOEs would like to increase number of employees for expanding the operation. SOEs tend to increase number of employees because they would like to expand its market share and operate more efficiently. Thus, the third hypothesis will be:

Hypothesis 3: A shift from state to private ownership is likely to be associated with an increase in number of employees.

D'Souza and Megginson (1999) compare financial and operating performance of 85 privatized enterprises from 1990 to 1996 in 28 developing countries. They calculate the mean of each indicator for each firm over the pre-post privatization windows (pre-privatization: years -3 to -1 and post-privatization: years + 1 to + 3) and the privatization year is year 0. The authors first compare the indicators of profitability, operating efficiency, capital investment, output, employment, leverage and dividend. They use a pre-post comparison method to know if there are changes the mean, median values of the indicators through the T test and Z test. In addition, comparisons are made through different industries, government control, origin of enterprises (in the industrialized and non-industrialized countries), changes in management board and changes in CEO position. The study shows that there is an increase in real sales, become more profitable, increase their capital investment spending, improve their operating efficiency, and increase their work forces. However, these enterprises significantly lower their debt levels and increase dividend payout. The results of this study are consistent with study results by Megginson et al., (1994), Boubakri and Cosset (1998). Loc and Tran (2016) continue to assess the impact of equitization on firm performance after equitization in Vietnam using a with-without comparison method to comparing firm performance 301 equitized firms and 127 non-equitized firms for the period 2007 to 2010. The results show that IBTA and IBTS measures increase after equitization, and there is a decline in debt ratio compared to non-equitized enterprises. The results of this study are quite consistent with those of La Porta and Lopez-de-Silanes (1999) and Harper (2002). Thus, the next hypothesis will be:

Hypothesis 4: A shift from state to private ownership is likely to be associated with a decline in the use of debt.

Agency theory is based on the focus of different representation issues in each ownership form. Managers in both state and private enterprises want to maximize their benefits rather than owner's interests (Jensen & Meckling, 1976). This theory suggests that managers' actions are not always from the owner's interests, which can have a negative impact on the firm performance. For private firms, the difference in benefits between managers and owners is narrowed through external mechanisms such as external capital mobilization or internal control, for example management participation of owners, good reward system and effective board of directors. At the same time, SOEs do not fully reflect these aspects of the organization, leading to inefficient performance. Economists supporting the theory argue that once an enterprise is privatized, its performance becomes better by narrowing the difference in manager's and owner's interest. In short, when enterprises are privatized, owners will have more participating in management and the enterprise is controlled by the appropriate inspection mechanism and enterprises are likely to operate more efficiently (Ott & Hartley, 1991). Dharwadkar et al., (2000) study the privatization in transition countries also confirms that the agency theory can explain why enterprises operate more effectively after equitization. Studies in Vietnam such as Loc et al. (2006), Tran et al., (2015), Loc and Tran (2016), Hung et al., (2017), Nhan and Son (2017) show that equitized enterprises have an increase in firm performance, especially profitability and real sales. This result is consistent with the results of studies in the developed and developing countries by Megginson et al., (1994), Boubakri and Cosset (1998), La Porta and Lopez-de-Silanes (1999), Dewenter and Malatesta (2001). Thus, the final hypothesis will be as follows:

Hypothesis 5: A shift from state to private ownership is likely to be associated with an increase in growth rate.

4. Methodology Limitations of Previous Studies

Since Megginson et al., (1994) first proposed to use pre-post comparison method and seven indicators to measure financial and operating performance of privatized enterprises, the following empirical studies focus on quantitative research methodology, and they identify the changes in mean, median values with Wilcoxon signed-rank test (Wilcoxon T test) and proportion of enterprises adopting changes with Mann–Whitney test. Further, studies using these methods include the study by Boubakri and Cosset (1998), La Porta and Lopez-de-Silanes (1999), D'Souza and Megginson (1999), Dewenter and Malatesta (2001), ... or some of the studies that have built up the regression model to assess the impact of privatization, for example Harper (2002) identifies the factors that affect the percentage change from pre- to post-privatization performance measure through a multiple regression model with time series data in the Czech Republic, Boubakri et al., (2004) also develop one regression model to apply in the context of Asian countries or D'Souza et al., (2005) apply in developing countries. Pre-post comparison method has certain limitations because this does not consider a 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 policy can help privatized enterprises really operate more efficiently after privatization or not.

Studies by Megginson et al., (1994), Boubakri and Cosset (1998), La Porta and Lopez-de-Silanes (1999), Dewenter and Malatesta (2001) examine the impact of privatization on firm performance and only focus on pre-post comparison method to compare changes in financial and operating measures, but they don't develop research models to present direct effects of privatization and state ownership after privatization on firm performance of privatized enterprises.

The studies by Loc and Tran (2016), Nhan and Son (2017) use the with-without comparison method with PSM technique using caliper or radius matching but the use of two control variables including firm size and establishment year to determine the propensity scores is not enough and can lead to wrong comparison. This is why the results are difficult to accurately compare measures between treatment and control groups. The study by Hung et al., (2017) only refers to the comparison of financial and operating performance measures between equitized enterprise and private enterprise groups without comparing with the non-equitized SOEs to fully figure out the impact of equitization.

Tran et al., (2015) examines the effects of privatization on firm performance of 309 privatized enterprises in Vietnam in 2009. This study uses new techniques to assess the effect of privatization on firm performance of privatized enterprises after privatization in Vietnam. They use with-without comparison method with a PSM technique (propensity score matching technique). The authors use some common characteristics (control variables) between treatment group (privatized enterprises) and control group (non-privatized enterprises) and based on these common points, they compare propensity scores with control variables, including scale (the natural logarithm of labor) and firm age. This technique helps to create similarities in comparing firm performance measures between privatized and non-privatized enterprises. According to Li (2013), PSM reconstructs counterfactual by adjusting covariates between the treated and control groups. Second, PSM can detect the lack of covariate distribution between two groups and adjust the distribution accordingly. After using PSM technique, the author develops one regression model to measure the impact of privatization on firm performance in Vietnam. However, consideration of firm size and year of establishment is not reasonable in PSM technique because there are still biases when the author may compare privatized and non-privatized enterprises in different industries. Loc and Tran (2016) continue to assess the impact of equitization on firm performance after equitization in Vietnam using a with-without comparison method to comparing firm performance 301 equitized firms and 127 non-equitized firms for the period 2007 to 2010. The authors use using propensity score matching (PSM) combined with

difference in differences (DID) to identify differences in firm performance between equitized and non-equitized enterprises. Similar to the study by Tran et al., (2015), Loc and Tran (2016) consider firm size and year of establishment as control variables in PSM technique but it is not reasonable in this technique because there are still biases when the authors may compare privatized and non-privatized enterprises in different industries. In addition, the PSM-DID method also compare differences in firm performance measures between equitized and non-equitized enterprises without considering the industry factor. Furthermore, the authors have not developed a regression model to assess the effect of equitization as well as the economic factors, ownership on firm performance of equitized enterprises after equitization.

5. Data and Research Methodology

This research uses a “pseudo” panel data with a two “period” windows (pre- and post- privatization). The equitization windows include 2 year prior to equitization and 2 year after equitization in Vietnam. Data are selected from Vietnamese General statistics office. This research uses performance information of equitized SOEs in 2014.

According to Loc and Tran (2016), since DD technique has been previously employed merely for treatment and control groups without pair matching, analysis of the policy impact would rely on the average values of the changes in measures calculated for these two groups. If the value range considered is too large, then it will be more likely to result in biases in the estimated results. So, the new contribution in regression model proposed by Hirano et al is a combination of PSM and DID techniques to avoid biases in data selection bias between treatment and control groups.

$$\text{Perf}_{it} = \beta_0 + \beta_1 T_i * t + \beta_2 T_i + \beta_3 t + \eta X_{it} + \varepsilon_{it}$$

Where Perf_{it} is performance measures of enterprise i at time t . Measures of firm performance are proposed by Megginson et al., (1994) and these measures include Profitability (ROA, ROE), Operating efficiency (Sales Efficiency, Net Income Efficiency, Total assets turnover), Employment (total employees), Leverage (Debt to Assets) and Growth.

Table 2: Variable description

Variables	Proxies	Measurement
Dependent variables (performance measures)		
P(1) Profitability	Return on Assets (ROA)	Net Income / Total Assets
	Return on Equity (ROE)	Net Income/ Equity
P(2) Operating efficiency	Sales Efficiency (SALEF)	Sales/ Number of employees
	Net Income Efficiency (NIEFF)	Net Income/ Number of employees
	Total assets turnover (TAS)	= total sales/ total assets
P(3) Employment	Total Employment (EMPL)	Total Number of employees
P(4) Leverage	Debt to Assets (LV)	Total Debt/ Total Assets
P(5) Growth	Real sales growth rate (RSG)	$(\text{RSales}_t - \text{RSales}_{t-1})/\text{RSales}_{t-1}$
	Real profit growth rate (RPG)	$(\text{RProfit}_t - \text{RProfit}_{t-1})/\text{RProfit}_{t-1}$
Independent variable (equitization)		
t	time dummy (period dummy)	$t = 0$ for post-equitization period and $t = 1$ for post-equitization period
Ti	equalization dummy	equitized enterprises are coded as 1, otherwise 0
Ti * t	PSM-DID estimator	the interaction term of equitization dummy and period dummy
Control variables		
Xit	LEMPBL	Natural logarithm of total employees
	LNASSETB	Natural logarithm of total assets

Source: proposed by the authors based on previous studies

The author uses several proxies for one variable to test robustness of results. Previous studies have not tested this characteristic so their results may not be so reliable. The author uses these dependent variables because these variables are testable and can explain the efficient status of SOEs proposed mainly by Megginson et al., (1994), Tran et al., (2015), etc. According to Tran et al., (2015), firm size and age of the company can be considered as control variables to identify propensity scores, Tran et al., (2015) also use number of employees and total assets as firm size measures. This research has shown that firm size and age have significantly negative impact on firm performance (ROE, ROA) in some cases.

The dependent variables include time dummy ($t = 0$ for post-equitization period and $t = 1$ for post-equitization period); T_i is the equalization dummy (equitized enterprises are coded as 1, otherwise 0). $T_i * t$ is the interaction term of privatization dummy and period dummy adapted from model proposed by Hirano. X_{it} is a vector of control variables including firm size (LNASSET and LNEMP). DID estimators will be embedded in β_1 coefficients ($\beta_1 = \text{DID}$) which represent the effect of equitization program on firm performance of equitized SOEs after equitization, *ceteris paribus*.

Tran et al. (2015) only directly apply regression method and does not define treatment and control groups first which means the author use separate regression and PSM-DID methods. For this approach, the study by Tran et al., (2015) has shortcomings because that research has not overcome data selection biases when not considering propensity scores before using regression method. In this research, the author uses PSM technique first to identify treatment and control groups in each year through 3 control variables, including firm size (the natural logarithm of assets), firm age (the natural logarithm of firm age) and industry. After that, this research employs regression model proposed by Hirano et al., (2003).

According to Khandker et al., (2009), Propensity score matching (PSM) constructs a statistical comparison group that is based on a model of the probability of participating in the treatment, using observed characteristics. Participants are then matched on the basis of this probability, or propensity score, to nonparticipants. The average treatment effect of the program is then calculated as the mean difference in outcomes across these two groups. The validity of PSM depends on two conditions: (a) conditional independence (namely, that unobserved factors do not affect participation) and (b) sizable common support or overlap in propensity scores across the participant and nonparticipant samples.

6. The Empirical Results

The important contribution of this study is that the author use PSM technique in the first step to find out whether the treatment (equitized SOEs) and control group (non-equitized SOEs) have common characteristics through propensity scores and these characteristics are firm age, firm size and industry. Using PSM technique in the first step will help the author eliminate the possibility of biases in data selection. While all earlier empirical studies using with-without comparison approach have not performed PSM technique in the first step, these studies have direct comparison between equitized and non-equitized SOEs. Tran et al., (2015) use PSM technique to select two groups of equitized and non-equitized SOEs with the same characteristics of age of SOEs and firm size without considering industry differences. After that, Tran et al., (2015) evaluate average impact of privatization policy on firm performance. However, Tran et al., (2015) have not used PSM technique before regression analysis, so the regression method proposed by these authors has revealed some limitations on data selection biases when their regression model may include equitized SOEs and non-equitized SOEs with differences in of firm age, firm size and industry.

Initial research data include 58 SOEs equitized in 2014 and 120 non-equitized firms in the same period. The author has selected SOEs equitized in 2014 because there are many large-scale SOEs equitized in Vietnam in this year. After using the PSM technique, this research can choose suitable equitized and non-equitized SOES with the same characteristics of firm age, firm size and industry. Using PSM technique, the author eliminates two observations (one non-equitized SOEs) and the final

result only includes 58 equitized SOEs and 119 non-equitized SOEs. According to Khander, if the number of subjects in the control group is larger than that of the treatment group, the results of the PSM technique will be more accurate as there will be more subjects in control groups having similar characteristics with those in treatment group. Table 2 shows the descriptive statistics of firm performance measures.

Table 2: Descriptive statistics for equitized SOEs and non-equitized SOEs in 2014

Unit: Million VND

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	354	0.03	0.10	-0.99	0.77
ROE	354	0.05	0.37	-4.79	0.93
SALEF	354	1,301.84	3,855	52.29	43,927.26
NIEFF	354	213.47	2,131.47	-3,267.07	33,170.57
TAS	354	0.88	1.05	0	8.63
	354				
EMPL	354	734.25	1,624.57	7	18,341.50
LV	354	0.53	0.44	0	3.30
RSG	354	0.08	0.42	-0.97	4.51
RPG	354	0.03	3.90	-61.09	10.41
AGE	354	10.37	3.94	4	32
	354				
ASSET14	354	2,536,448	9,269,995	2,764	73,120,592
EMPL14	354	811.27	1,942.09	6.00	18,732.00

According to the research results, enterprises have considerable differences in profitability (ROS, ROA, ROE). Large scale SOEs generally have negative net income due to inefficient performance in terms of profitability. Therefore, the efficiency of these enterprises may be negative when calculating the ratio of net income over number of employees. The statistic results show that the majority of state-owned enterprises in Vietnam are inefficient because net income is relatively high and the net income efficiency has the lowest negative value of -3,267.07 million VND. According to the results, only total asset (ASSET14) has the highest standard deviation and this is suitable because Vietnamese state-owned enterprises have differences in firm size in 2014.

Table 3: Frequency statistics for equitized SOEs and non-equitized SOEs in 2014

Characteristics	Frequency	Percent	Cumulative percent	Notes
Prior to equitization	177	50	50	
After equitization	177	50	100	Number of observations
Non-equitized SOEs	119	67.23	67.23	
Equitized SOEs	58	32.77	100	Number of firms

According to the results of PSM technique, the number of valid observations is 354 observations, with 119 non-equitized companies and 58 equitized firms. As this paper use data in two equitization windows, the total sample size includes 354 valid observations. After using PSM technique to determine propensity scores, the author applies the regression method to estimate the DID estimator, which is why the author calls this a PSM-DID technique associated with regression. All previous studies have not combined these two methods so there are still certain limitations of data selection bias.

Contrary to the study of Tran et al., (2015) using only OLS models for two period panel data without testing whether FEM and REM models are more appropriate or not. Therefore, Tran et al., (2015) have assumed that the characteristics of enterprises are constant and do not affect firm performance. In this paper, the author uses appropriate tests to choose between three OLS, FEM and REM models for each case.

Table 4: Regression results with PSM-DID estimators

Variables	ROA	ROE	SALEF	NIEFF	TAS
Ti*t	0.002	0.12	-788.49	208.40	-0.23
	0.91	0.14	0.15	0.23	0.11
Ti	omitted	-0.17***	omitted	omitted	omitted
		0.01			
t	-0.01	0.02	677.41**	154.44	0.25***
	0.62	0.61	0.04	0.13	0.00
LNASSETB	-0.03***	-0.02	419.42	-243.13**	-0.65***
	0.01	0.23	0.24	0.03	0.00
LNEMPLB	-0.02	0.03*	2,257.30***	536.78***	-0.16
	0.19	0.09	0.00	0.00	0.17
_cons	0.48***	0.09	8,405.03**	6,178.72***	9.75***
	0.00	0.46	0.04	0.00	0.00
R2	0.00	0.04	0.00	0.00	0.01
F-statistic	3.83***	2.70**	8.42***	8.80***	20.27***
N	354	354	354	354	354
Regression model	FEM	OLS	FEM	FEM	FEM

Note: ***, **, and * denote significance levels of 1%, 5%, and 10% respectively.

FEM, OLS, and REM denote fixed effect, ordinary least square and random effect models

The results show that the profitability of post-equitization firms (ROE and ROA) is not statistically significant, which means that there is no evidence to conclude whether profitability of equitized SOEs increase or not after equitization. The results of this study are contrary to the study by Tran et al., (2015) who have suggested that after equitization, equitized enterprises significant increase in ROE and ROA. Megginson et al., (1994), Boubakri and Cosset (1998) also argue that SOEs have an increase in profit after equitization in developed and developing countries. However, these authors use only pre-post comparison method without considering both equitized SOEs with non-equitized SOEs in the same period. The results of the study show that, compared to the same non-equitized SOEs in Vietnam, there is no evidence that equitized firms perform better than non-equitized SOEs in the same period. However, the results of this study are consistent with the study by Cuervo and Villalonga (2000) because these authors have argued that privatization and ownership are not the main determinants of firm performance of SOEs after privatization. Carlin and Pham (2009) study the effect of privatization on the firm performance of privatized enterprises after privatization in Vietnam. Research data includes 21 companies listed on the HCMC and Ha Noi Stock Exchange in the period of 2000 to 2003. The research results by Carlin and Pham (2009) show that privatized enterprises have a decline in profitability but have an improvement in working capital management and financial leverage increase as enterprises want to increase capital after privatization. Carlin and Pham (2009) argue that privatized enterprises face very substantial challenges in their first years of private operation.

However, the results of this study also show that there is a difference in ROE of equitized SOEs compared to non-equitized SOEs, in which the ROE of equitized SOEs is lower than that of non-equitized firms. This is because the net income of equitized firms is lower than that of non-equitized firms, especially equitized firms may face many difficulties in their operations. The first year after equitization, the change in ownership structure, restructuring activities also made these equitized SOEs reduce net income. Furthermore, equitized SOEs issue shares after equitization which make their equity increase considerably.

In terms of performance, there is no evidence that equitized firms are more efficient after equitization, when considered in relation to non-equitized firms. The results of this study differ from studies by Boubakri and Cosset (1998), D'Souza and Megginson (1999) because these previous authors used only pre-post comparison method and applied for privatized SOEs and non-privatized SOEs separately.

Similarly, the results also show that there is no evidence that the number of workers increases after equitization. Megginson et al., (1994), Boubakri and Cosset (1998) suggest that privatized SOEs increase the number of employees after privatization in developed and developing countries. However, the results of this study are similar to those of study by Loc and Tran (2016).

Table 5: Regression results with PSM-DID estimators (*cont*)

Variables	EMPL	LV	RSG	RPG
Ti*t	32.42 0.86	-0.10 0.01**	0.05 0.56	0.62 0.49
Ti	omitted	omitted	-0.11 0.11	0.10 0.87
t	-15.82 0.89	0.073*** 0.00	-0.09* 0.08	-0.28 0.58
LNASSETB	-173.17 0.16	-0.10*** 0.00	-0.01 0.46	0.10 0.49
LNEmplB	1,156.04*** 0.00	0.00 0.97	0.02 0.34	-0.06 0.78
_cons	-3,526.56** 0.01	1.80*** 0.00	0.18 0.21	-0.92 0.49
R2	0.40	0.02	0.02	0.01
F-statistic	14.91***	6.82***	1.50	0.87
N	354	354	354	354
Regression model	FEM	REM	OLS	OLS

Note: ***, **, and * denote significance levels of 1%, 5%, and 10% respectively.

FEM, OLS, and REM denote fixed effect, ordinary least square and random effect models

The ratio of debt to total assets of equitized firms after equitization has decreased considerably in the common trend with non-equitized enterprises. The results of this study are consistent with those of Boubakri and Cosset (1998), Loc and Tran (2016), La Porta and Lopez-de-Silanes (1999) and Harper (2002). After equitization, state-owned enterprises will reduce the use of debts because equitized SOEs may use other sources such as issuing stocks with lower capital expenses.

The regression results also show that there can be no increase in the growth rate of revenue and profit of equitized SOEs after equitization. The results of this study are not consistent with those by Loc et al., (2006), Tran et al., (2015), Loc and Tran (2016), Hung et al., (2017), Nhan and Son (2017), Megginson et al., (1994), Boubakri and Cosset (1998), La Porta and Lopez-de-Silanes (1999), Dewenter and Malatesta (2001). It can be explained that previous studies have used pre-post comparison method and only considered equitized enterprises, not considering the common trend with non-equitized enterprises. Thus, this is a new finding of the study when considering both equitized and non-equitized SOEs in same regression models.

7. Summary and Concluding Remarks

Previous studies mainly use pre-post comparison method or with-without comparison method (Tran et al., 2015). In particular, Tran et al., (2015) have applied regression method to estimate DID estimator, but these authors have not used PSM technique before applying regression, so they may use data from equitized enterprises and non-equitized enterprises with different characteristics in terms of firm age, firm size and industry. This study overcome this limitation of the study by Tran et al., (2015) and this is the first study to apply the PSM technique before estimating DID estimator based on regression models proposed by Hirano et al. The use of PSM technique prior to regression helps the author to select equitized and non-equitized firms with similarities in terms of firm age, firm size and industry, which will help DID estimation become more accurately. Each DID estimator is the interaction term of equitization dummy and time period. Through this coefficient, the author can determine whether

equitized firms have significantly improved their performance after equitization in relation to non-equitized firms or not.

Research results show that, if considered together with non-equitized enterprises, the profitability of the enterprises after equitization (ROE and ROA) is not statistically significant increased. In terms of operating efficiency, there is no evidence that equitized firms are more efficient after equitization. In addition, the results of the study show no evidence that the number of workers increased after equitization.

Furthermore, equitized SOEs tend to reduce the use of debt after equitization, which is likely because firms may not use too much debt, but instead use other sources such as stock issuance for lower capital expense (Loc and Tran, 2016). The regression results also show that there can be no increase in the growth rate of revenue and profit of equitized SOEs after equitization.

Although 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), Megginson et al., (1994), Boubakri and Cosset (1998), this study shows the fact that if considered in relation to non-equitized firms, firm performance maybe not improved after equitization. This is a new finding of this study because the approach and method are different from previous approaches when considering only the effect of equitization on firm performance of two separate groups (equitized and non-equitized SOEs). However, the results of this study also 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 privatization, because these theories mostly assume that privatized firms operate more efficiently after privatization but not in relation to non-privatized SOEs in the same period.

The research also answers the question of why enterprises sometimes do not want to participate in equitization in Vietnam because equitization does not always help enterprises to increase their efficiency if considered in relation with non-equitized SOEs. In particular, 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. Other issues can explain firm performance after equitization can be corporate governance, ownership structure and economic factors during equitization windows. Therefore, the authors suggest 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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