

# Equitization and Operating and Financial Performance: Empirical Evidence from Vietnamese Companies

**Nguyen Ton Nhan**

*Center for Economic and Financial Research, University of Economics and Law  
Vietnam National University of Ho Chi Minh city<sup>1</sup>*

**Tran Hung Son**

*Center for Economic and Financial Research, University of Economics and Law  
Vietnam National University of Ho Chi Minh city*

## Abstract

The paper evaluates the impacts of equitization on firm performance. Besides pre- and postprivatization comparison method of Megginson (1994), this study uses propensity score matching and difference-in-difference methods in order to overcome the selection bias and the inadequateness to pick out the equitization effect from the coexisting effects of other economic factors. We find that equitization can consistently enhance the firm performance in terms of profitability and sales efficiency in exchange for employment security. This strong evidence of profitability and sales efficiency increase is also found in our subsamples of equitized SMEs and large businesses despite some dissimilarities in net income efficiency and output. Our findings imply that equitization plays a vital role in enhancing the performance of Vietnamese state-owned enterprises.

**Keywords:** Equitization, firm performance, propensity score matching, difference-in-difference, selection bias

**JEL Classification:** L25

## 1. Introduction

Privatization of state-owned enterprises (SOEs) has become a worldwide phenomenon in both developed and developing countries and this has led to a change in the ownership structure of the business globally. Governments expect that the transfer of ownership from state to private in SOEs will help businesses to operate more effectively. Studies on privatization show that the transition from SOEs to private enterprises offers a number of benefits for businesses. Many empirical studies in the world show that firms' performance has improved after privatization, e.g., La Porta et al. (1999), Claessens and Djankov (1999a), Boardman and Vining (1989), Vining and Boardman (1992), Dewenter and Malatesta (2001) and Tian (2000).

Unlike other countries in the world, the process of converting SOEs into joint-stock companies is called equitization and this is a major policy in Vietnam. Transferring the ownership of SOEs from state to private, the Vietnamese government aims to create new driving force in order to help businesses proactively improve their performance. Up to now, despite the equitization program in Vietnam started early in 1990s, the process of equitization of SOEs has been pushed up nationwide. Another factor that pushes for SOE reform through equitization is that the Government of Vietnam

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needs to comply with the most recent bilateral and multilateral agreements, e.g., the TPP agreement and ASEAN Economic Community. Therefore, what many researchers and policymakers are interested in right now is how this program affects the performance of enterprises.

So far, there have been some studies on the performance of equitized firms in Vietnam e.g., Truong et al. (2006), Ngo et al. (2015) and Truong et al. (2015). However, there are still some limitations regarding the research about equitization in Vietnam such as the methodology and incomplete data. Therefore, the objective of this study is to provide an in-depth study about the impacts of equitization on the performance of Vietnamese SOEs.

The next section discusses prior related research. Section 4 presents our hypotheses. Section 4 describes our research methodology and sample. Section 5 provides the empirical results, and section 6 concludes.

## **2. Previous Research**

So far, there have been many studies on the financial performance of enterprises after equitization. Megginson et al. (1994) examines the performance of 61 companies from 18 countries and 32 industries before and after privatization in the period 1961 to 1990. The authors use Wilcoxon signed-rank test and proportion test to test whether the median difference in variable values between the pre- and postprivatization samples is zero. Their results report strong performance improvements and achieved without losing employment security. Specifically, profitability, operating efficiency and work forces increase significantly after SOEs are privatized. Moreover, these companies significantly lower their debt levels.

Using the same methodology, with the data of privatized SOEs in Mexico, La Porta et al. (1999) reports the increase in profitability, operating efficiency and output but the decrease in work forces. Harper (2002) also shows the increased profitability and operating efficiency and the decreased employment for the dataset of 178 firms in Czech Republic. Studying 103 privatized firms in 23 developed countries, D'Souza et al. (2005) documents that these companies become more profitable, increase their efficiency, output and capital expenditure significantly but no evidence for the decreased work forces. Similarly, using the data of 103 privatized firms in emerging and developed countries, Mathur and Banchuenvijit (2007) also reports the increase in profitability, efficiency, capital expenditure, output and dividend payment and the decrease in financial leverage and employment. The authors conclude that privatization increases the firm's operating efficiency in every country, industry and competitive environment. Boubakri et al. (2009) analyzed the impacts of privatization on the performance of 189 firms in 39 countries in 1984-2002. The results show that privatization has the effect of enhancing the profitability, efficiency and capital investment of enterprises.

Using difference-in-difference (DID) with control variables and propensity score matching techniques (PSM), Ngo et al. (2015) reports that a shift from state or collective ownership to private ownership can consistently enhance the performance of privatized firms in terms of profitability. Truong et al. (2015), with PSM combined with DID approach, shows that equitization leads to the increase in profitability and the decrease in financial leverage and employment.

## **3. Hypotheses**

Following previous research, we expect that the equitization will: (i) increase firm's profitability; (ii) lead to an improvement of operating efficiency; (iii) be associated with a decline in the use of employment; and (iv) decrease the use of debt.

The specific testable predictions and proxies we employ to measure profitability, operating efficiency, output, employment and leverage are detailed in Table 1. Note that we cannot clearly predict what will happen to real sales as discussed in Megginson (1994).

**Table 1:** Summary of Proxies and Testable Prediction

Characteristics	Proxies	Predicted Relationship	
		Pre- and postequitization	Equitized firms vs. non-equitized SOEs
Profitability	Return on Assets (ROA) = Net Income / Total Assets	$ROA_A > ROA_B$	$ROA_E > ROA_N$
	Return on Equity (ROE) = Net Income / Equity	$ROE_A > ROE_B$	$ROE_E > ROE_N$
	Return on Sales (ROS) = Net Income / Sales	$ROS_A > ROS_B$	$ROS_E > ROS_N$
Operating efficiency	Sales Efficiency (SALEFF) = Sales / Number of Employees	$SALEFF_A > SALEFF_B$	$SALEFF_E > SALEFF_N$
	Net Income Efficiency (NIEFF) = Net Income / Number of Employees	$NIEFF_A > NIEFF_B$	$NIEFF_E > NIEFF_N$
Output	Real Sales (SAL) = Nominal Sales / Consumer Price Index	$SAL_A ? SAL_B$	$SAL_E ? SAL_N$
Employment	Total Employment (EMPL) = Total Number of Employees	$EMPL_A < EMPL_B$	$EMPL_E < EMPL_N$
Leverage	Debt to Assets (LEV) = Total Debt / Total Assets	$LEV_A < LEV_B$	$LEV_E < LEV_N$

#### 4. Data and Research Method

All Vietnamese firms from the annual business surveys of the Vietnamese General Statistics Office (VGSO) with information needed for calculating ROA, ROE, ROS, sales efficiency, net income efficiency, real sales, employment and financial leverage are collected for the 9-year period from 2005 to 2013. Treatment group includes equitized firms who switch their legal types from “central/local SOEs and central/local state limited company” to “partnership company, limited company, joint stock company with state capital being greater than 50% and joint stock company without state capital or with state capital being smaller than 50%” during the period 2007 to 2011. Consequently, treatment group comprises 78, 33, 14, 9 and 92 SOEs equitized in 2007, 2008, 2009, 2010 and 2011, respectively.

Firstly, we follow MNR method (Megginson, 1994) to compare the firm performance before and after equitization. The mean of each proxy is calculated for each firm 2 years before and 2 years after equitization. Then, the Wilcoxon signed-rank test is used to test for the median difference in variable values between pre- and postequitization samples.

Secondly, we use PSM method to control for the potential bias due to the fact that government does not choose SOEs to be equitized randomly. Each of the equitized firms from treatment group is assigned a match with a closely comparable non-equitized SOEs from control groups. The match is found by using a scoring rule, based on a logit model which applied to the sample consisting equitized firms (156 firms which have needed data) and full period SOEs (1492 firms) for each equitized year 2007 to 2011. The dependent variable is binary variable (1 for equitized firms and 0 for non-equitized SOEs). The explanatory variables in these logistic regression models are *years of operation* and  $\ln(EMPL)$ , *EMPL* is the total number of employees 1 year before equitization. We use Caliper Matching (0,0.01) to match one equitized firm (from treatment group) with one SOE (from control group) based on propensity score (the score difference must be less than 0.01). With this matching method, less biased-performance differences may be estimated.

Finally, besides comparing the differences between treatment and control group, we also use DID method (as described in table 2) to examine the performance of these groups. By using the combined PSM-DID we can eliminate the time effect to firm performance (firms become more efficient over time as they grow and be more experienced). In addition, macro effects (trade liberalization and the development of stock market over time) on firm performance can be removed.

**Table 2:** DID Method

	Mean value before equitization, t = 0	Mean value after equitization, t = 1	Difference between before and after equitization	DID (treatment group vs. control group)
Treatment group	T(0)	T(1)	DT=T(1)-T(0)	DTC=DT-DC
Control group	C(0)	C(1)	DC=C(1)-C(0)	

## 5. The Empirical Results

### 5.1 The Impact of Equitization on the Performance of SOEs, Full Sample

#### Profitability Changes

SOEs are usually unprofitable, partly because their goals are to maximize employment and develop backward regions (Boycko et al., 1996). Therefore, after equitization, firms could be more profitable because the new owners are more concerned about profit and efficiency.

We measure profitability using three ratios: return on assets (ROA), return on equity (ROE) and return on sales (ROS). As expected, profitability increases significantly after equitization according to ROS and ROA. The mean (median) increases in ROA and ROS 1 year after equitization are 1.1 percentage points (0.6 percentage points) and 0.9 percentage points (0.5 percentage points), respectively. These test statistics are all significant at the 1 percent level.

ROA average (median) 2 years after equitization increases by 0.5 percentage points (0.5 percentage points). Wilcoxon signed rank test also shows the significant median increase in ROS 2 years after equitization by 0.8 percentage points. These test statistics are all significant at the 5 percent level.

When comparing with similar non-equitized SOEs, using PSM-DID method, the mean (median) value of ROS 1 year after equitization of equitized SOEs is 1.7 percentage points (0.4 percentage points) higher than that of non-equitized SOEs. The test statistics is significant at the 10 percent level.

**Table 3:** The Impact of Equitization to Performance of SOEs, 1 Year Before and After Equitization

Variable	N	Before & After			PSM			PSM-DID		
		Mean Change	Median Change	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)
<b>Profitability</b>										
ROA	156	<b>0.011</b>	<b>0.006</b>	<b>0.001</b>	-0.010	-0.002	0.553	0.008	0.006	0.166
ROE	156	-0.008	0.032	0.397	0.011	0.043	0.547	0.025	0.003	0.379
ROS	156	<b>0.009</b>	<b>0.005</b>	<b>0.007</b>	-0.008	-0.007	0.306	<b>0.017</b>	<b>0.004</b>	<b>0.089</b>
<b>Efficiency</b>										
SALEFF	156	<b>397.3</b>	<b>88.3</b>	<b>0.000</b>	<b>551.0</b>	<b>98.0</b>	<b>0.005</b>	<b>358.0</b>	<b>49.2</b>	<b>0.000</b>
NIEFF	156	<b>4.4</b>	<b>5.3</b>	<b>0.000</b>	-2.6	2.9	0.927	-6.7	4.2	0.551
<b>Output</b>										
SAL	156	-1.5	-3.0	0.462	63.2	15.7	0.172	<b>281.6</b>	<b>44.0</b>	<b>0.071</b>
<b>Employment</b>										
EMPL	156	<b>-7.1</b>	<b>-11.0</b>	<b>0.001</b>	<b>-192.9</b>	<b>-48.0</b>	<b>0.001</b>	<b>-118.2</b>	<b>-6.0</b>	<b>0.001</b>
<b>Leverage</b>										
LEV	156	0.000	0.017	0.711	<b>0.142</b>	<b>0.217</b>	<b>0.000</b>	0.012	0.000	0.676

**Table 4:** The Impact of Equitization to Performance of SOEs, 2 Years Before and After Equitization

Variable	N	Before & After			PSM			PSM-DID		
		Mean Change	Median Change	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)
<b>Profitability</b>										
ROA	156	<b>0.005</b>	<b>0.005</b>	<b>0.018</b>	-0.008	-0.002	0.452	0.000	0.003	0.808
ROE	156	-0.029	0.013	0.697	-0.012	0.037	0.405	-0.045	0.000	0.566
ROS	156	<b>-0.002</b>	<b>0.008</b>	<b>0.021</b>	0.003	-0.009	0.261	0.012	0.005	0.418
<b>Efficiency</b>										
SALEFF	156	<b>506.0</b>	<b>148.1</b>	<b>0.000</b>	<b>594.4</b>	<b>148.3</b>	<b>0.007</b>	<b>594.4</b>	<b>148.3</b>	<b>0.000</b>
NIEFF	156	<b>11.7</b>	<b>5.8</b>	<b>0.000</b>	-0.5	1.8	0.877	0.8	-1.8	0.717
<b>Output</b>										
SAL	156	16.4	12.6	0.172	78.0	30.0	0.148	0.0	34.9	0.137
<b>Employment</b>										
EMPL	156	<b>-101.6</b>	<b>-28.0</b>	<b>0.000</b>	<b>-189.4</b>	<b>-53.5</b>	<b>0.004</b>	<b>0.0</b>	<b>-116.4</b>	<b>0.001</b>
<b>Leverage</b>										
LEV	156	-0.021	0.015	0.910	<b>0.137</b>	<b>0.196</b>	<b>0.000</b>	-0.008	0.002	0.536

### Efficiency Changes

With the equitization process, it is expected that these firms will employ their human, financial, and technological resources more efficiently. In removing the noneconomic objectives from their SOEs, governments hope that these SOEs would increase their operating and financial efficiency.

Both of the efficiency measures: sales per employee (SALEFF) and net income per employee (NIEFF) show significant median increases following equitization. The average (median) values of sales per employee increase by 397.3 points (88.3 points) 1 year after equitization and 506 points (148.1 points) 2 years after equitization. The average (median) values of income per employee increase by 4.4 points (5.3 points) 1 year after equitization and 11.7 points (5.8 points) 2 years after equitization. These test statistics are all significant at the 1 percent level.

When comparing with similar non-equitized SOEs, PSM and PSM-DID methods show significant median difference in sales per employee 1 and 2 years after equitization. With PSM method, sales per employee averages (medians) of equitized SOEs are higher than those of non-equitized SOEs by 551 points (98 points) in the case of 1 year after equitization and 594.4 points (148.3 points) in the case of 2 years after equitization. Similarly, with PSM-DID method, sales per employee averages (medians) of equitized SOEs are higher than those of non-equitized SOEs by 358 points (49.2 points) in the case of 1 year after equitization and 398.7 points (66.6 points) in the case of 2 years after equitization. These test statistics are all significant at the 1 percent level.

### Changes in Output

SOEs are expected to increase their real sales after equitization because of the better motivation, more flexible financing opportunities and broader scope for entrepreneurial creativity (Megginson, 1994). On the other hand, Boycko et al. (1993) assert that effective equitization will decrease output, since the government can no longer force managers (through subsidies) to maintain inefficiently high output levels.

Table 3 and 4 do not provide any significant results for real sales changes after equitization. However, when comparing with similar non-equitized SOEs, PSM-DID method shows significant median differences: real sales average (median) of equitized-firms is higher than that of non-equitized SOEs by 281.6 VND billion (44 VND billion). The test statistics is significant at the 10 percent level.

### Employment Changes

SOEs tend to cut off their employment after equitization to reduce cost and increase profit and operating efficiency. The results show significant employment decrease after equitization: the averages (medians) number of employees 1 and 2 years after equitization decrease by 7.1 employees (11

employees) and 101.6 employees (28 employees), respectively. These test statistics are all significant at the 1 percent level.

When comparing with similar non-equitized SOEs, PSM and PSM-DID method show the significant median differences in the number of employees for both 1 year and 2 years after equitization. Using PSM method, the employment averages (medians) of equitized firms are lower than those of non-equitized SOEs by 192.9 employees (48 employees) in the case of 1 year after equitization and 189.4 employees (53.5 employees) in the case of 2 years after equitization. Similarly, when using PSM-DID method, averages (medians) employment of equitized firms are lower than those of non-equitized SOEs by 118.2 employees (6.0 employees) in the case of 1 year after equitization and 116.4 employees (10.5 employees) in the case of 2 years after equitization. These test statistics are all significant at the 1 percent level.

### **Changes in Leverage**

Because SOEs cannot sell equity to private investors, they usually have high debt levels. Therefore, leverage ratios of equitized SOEs are expected to drop after equitization. On the other hand, with higher profitability and efficiency, there is a need for equitized SOEs to invest and expand production which will lead to the increase in financial leverage. The Wilcoxon tests show no significant results for the changes in leverage after equitization. PSM method shows significant median difference in leverage in both cases 1 and 2 years after equitization. Specifically, averages (medians) debt to assets of equitized firms are higher than those of non-equitized SOEs by 14.2 percentage points (21.7 percentage points) in the case of 1 year after equitization and 13.7 percentage points (19.6 percentage points) in the case of 2 years after equitization. These test statistics are all significant at the 1 percent level.

## **5.2 The Impact of Equitization on the Performance of SOEs, Classified Based on Scale**

### **Profitability Changes**

For the SMEs (total number of employees less than 300), the average (median) ROA increases by 1.7 percentage points (0.6 percentage points) 1 year after equitization (significant at the 1 percent level) and 0.8 percentage points (0.6 percentage points) 2 years after equitization (significant at the 10 percent level). For the large businesses, on the other hand, the average (median) ROS increases by 1.6 percentage points (1.6 percentage points) 1 year after equitization and 1.1 percentage points (1.5 percentage points) 2 years after equitization. These test statistics are all significant at the 5 percent level.

When comparing with similar non-equitized SOEs by PSM-DID method, the mean (median) values of ROE and ROS 1 year after equitization of equitized SMEs are 8.2 percentage points (0.5 percentage points) and 1.1 percentage points (0.5 percentage points) higher than those of similar non-equitized SMEs, respectively. These test statistics are significant at the 5 and 10 percent level. On the other hand, for the large businesses, with PSM method, the mean (median) value of ROE 1 year after equitization of equitized firms is 5 percentage points (6.7 percentage points) higher than those of non-equitized state-owned firms. The test statistics is significant at the 10 percent level.

### **Efficiency Changes**

The efficiency results are quite similar between SMEs and large businesses. Regarding sales per employee variable, table 5, 6, 7 and 8 show significant median increases for 1 and 2 years after equitization. Furthermore, median values of sales per employee of equitized firms are statistically significant higher than those of non-equitized SOEs with both methods PSM and PSM-DID and for both cases: 1 and 2 years after equitization (similar to our results of full sample). Additionally, income per employee also show significant median increase 1 and 2 years after equitization for both subsamples: SMEs and large businesses (similar to our results of full sample). However, only the

median value of income per employee 1 year after equitization of SMEs is significantly higher than that of comparable non-equitized SOEs (PSM-DID method).

### Changes in Output

There are many dissimilarities between SMEs and large business samples regarding the output variable. Firstly, in the case of 1 year after equitization, PSM method shows the significant difference in real sales median between equitized firms and non-equitized SOEs; however, average (median) of equitized large businesses is higher than that of similar non-equitized large businesses while it is lower in the case of SMEs. Secondly, in case of 2 years after equitization, PSM method gives the higher average and median values of equitized firms in compare with similar non-equitized SOEs for large business sample (significant at 10 percent level), but there is no significant difference for SME sample. Finally, PSM-DID method provides the significant result for only 2 years after equitization for SME sample. Specifically, the real sales average (median) of equitized SMEs is higher than that of non-equitized SMEs by 63.7 billion VND (4.1 billion VND). The test statistics is significant at 10 percent level.

### Employment Changes

Alike the full sample, the results show significant employment changes: the average and median number of employees decrease after equitization and lower than that of similar non-equitized SOEs except for large business sample (PSM method provides higher average and median employment for equitized large businesses 1 year after equitization).

### Changes in Leverage

The results show no difference with the full sample. PSM method provides higher average and median leverage for equitized firms. The leverage averages (medians) of equitized SMEs 1 and 2 years after equitization are 9.6 percentage points (17.8 percentage points) and 12.8 percentage points (21.3 percentage points) higher than those of non-equitized SMEs, respectively. Likewise, the leverage averages (medians) of equitized large businesses 1 and 2 years after equitization are 21.6 percentage points (25.2 percentage points) and 15.3 percentage points (17.0 percentage points) higher than those of non-equitized large businesses.

**Table 5:** The Impact of Equitization to Performance of Large Businesses, 1 Year Before and After Equitization

Variable	N	Before & After			PSM			PSM-DID		
		Mean Change	Median Change	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)
<b>Profitability</b>										
ROA	59	0.002	0.007	0.135	0.001	0.005	0.498	-0.003	0.006	0.912
ROE	59	-0.050	0.023	0.947	<b>0.050</b>	<b>0.067</b>	<b>0.057</b>	-0.066	0.002	0.702
ROS	59	<b>0.016</b>	<b>0.016</b>	<b>0.016</b>	0.004	0.004	0.947	0.026	0.005	0.373
<b>Efficiency</b>										
SALEFF	59	<b>316.2</b>	<b>139.9</b>	<b>0.000</b>	<b>378.6</b>	<b>53.7</b>	<b>0.099</b>	<b>265.5</b>	<b>60.3</b>	<b>0.010</b>
NIEFF	59	<b>6.9</b>	<b>5.8</b>	<b>0.006</b>	-1.7	2.4	0.852	-2.4	5.1	0.512
<b>Output</b>										
SAL	59	-61.3	-16.5	0.561	<b>497.6</b>	<b>284.2</b>	<b>0.000</b>	25.8	5.5	0.718
<b>Employment</b>										
EMPL	59	<b>-246.8</b>	<b>-95.0</b>	<b>0.004</b>	<b>266.9</b>	<b>368.0</b>	<b>0.000</b>	<b>-254.4</b>	<b>-50.0</b>	<b>0.007</b>
<b>Leverage</b>										
LEV	59	0.045	0.038	0.757	<b>0.216</b>	<b>0.252</b>	<b>0.000</b>	0.051	0.013	0.286

**Table 6:** The Impact of Equitization to Performance of Large Businesses, 2 Years Before and After Equitization

Variable	N	Before & After			PSM			PSM-DID		
		Mean Change	Median Change	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)
<b>Profitability</b>										
ROA	59	0.000	0.000	0.147	-0.013	0.011	0.797	-0.008	0.009	0.825
ROE	59	-0.067	0.027	0.871	-0.004	0.072	0.216	-0.085	0.020	0.276
ROS	59	<b>0.011</b>	<b>0.015</b>	<b>0.049</b>	-0.013	0.006	0.713	0.016	0.007	0.257
<b>Efficiency</b>										
SALEFF	59	<b>405.6</b>	<b>266.3</b>	<b>0.000</b>	<b>383.6</b>	<b>246.7</b>	<b>0.029</b>	<b>228.8</b>	<b>88.4</b>	<b>0.015</b>
NIEFF	59	<b>18.8</b>	<b>7.7</b>	<b>0.001</b>	-1.2	6.2	0.831	-1.8	6.8	0.947
<b>Output</b>										
SAL	59	8.5	16.7	0.517	<b>237.6</b>	<b>213.7</b>	<b>0.077</b>	-11.7	4.8	0.912
<b>Employment</b>										
EMPL	59	<b>-244.8</b>	<b>-78.0</b>	<b>0.008</b>	-161.0	-5.8	0.680	<b>-285.1</b>	<b>-85.5</b>	<b>0.003</b>
<b>Leverage</b>										
LEV	59	0.018	0.034	0.377	<b>0.153</b>	<b>0.170</b>	<b>0.000</b>	0.035	0.008	0.120

**Table 7:** The Impact of Equitization to Performance of SMEs, 1 Year Before and After Equitization

Variable	N	Before & After			PSM			PSM-DID		
		Mean Change	Median Change	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)
<b>Profitability</b>										
ROA	96	<b>0.017</b>	<b>0.006</b>	<b>0.001</b>	-0.018	-0.003	0.275	0.016	0.005	0.104
ROE	96	0.019	0.017	0.265	-0.013	0.017	0.958	<b>0.082</b>	<b>0.005</b>	<b>0.040</b>
ROS	96	0.005	0.004	0.121	-0.014	-0.011	0.447	<b>0.011</b>	<b>0.004</b>	<b>0.085</b>
<b>Efficiency</b>										
SALEFF	96	<b>447.4</b>	<b>74.2</b>	<b>0.000</b>	<b>657.6</b>	<b>106.4</b>	<b>0.004</b>	<b>415.3</b>	<b>33.4</b>	<b>0.001</b>
NIEFF	96	<b>2.9</b>	<b>5.8</b>	<b>0.001</b>	-3.1	3.2	0.583	<b>-9.4</b>	<b>2.4</b>	<b>0.040</b>
<b>Output</b>										
SAL	96	35.4	4.7	0.196	<b>-205.5</b>	<b>-66.5</b>	<b>0.001</b>	29.6	3.5	0.101
<b>Employment</b>										
EMPL	96	<b>-7.1</b>	<b>-11.0</b>	<b>0.028</b>	<b>-477.4</b>	<b>-175.0</b>	<b>0.000</b>	<b>-34.0</b>	<b>-3.0</b>	<b>0.014</b>
<b>Leverage</b>										
LEV	96	-0.029	0.011	0.464	<b>0.096</b>	<b>0.178</b>	<b>0.020</b>	-0.012	-0.016	0.953

**Table 8:** The Impact of Equitization to Performance of SMEs, 2 years Before and After Equitization

Variable	N	Before & After			PSM			PSM-DID		
		Mean Change	Median Change	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)	Mean Diff.	Median Diff.	Wilcoxon Test (p-value)
<b>Profitability</b>										
ROA	96	<b>0.008</b>	<b>0.006</b>	<b>0.053</b>	-0.005	-0.009	0.219	0.005	0.002	0.958
ROE	96	-0.005	0.004	0.825	-0.016	0.009	0.964	-0.021	-0.002	0.918
ROS	96	-0.010	0.004	0.192	0.012	-0.019	0.267	0.009	0.004	0.797
<b>Efficiency</b>										
SALEFF	96	<b>568.2</b>	<b>90.9</b>	<b>0.000</b>	<b>724.8</b>	<b>105.8</b>	<b>0.084</b>	<b>503.9</b>	<b>36.0</b>	<b>0.005</b>
NIEFF	96	<b>7.3</b>	<b>5.8</b>	<b>0.001</b>	-0.1	-0.8	0.918	-1.8	3.5	0.639
<b>Output</b>										
SAL	96	21.3	-2.8	0.193	-20.7	5.4	0.811	<b>63.7</b>	<b>4.1</b>	<b>0.054</b>
<b>Employment</b>										
EMPL	96	<b>-13.1</b>	<b>-14.5</b>	<b>0.000</b>	<b>-206.9</b>	<b>-58.5</b>	<b>0.000</b>	-12.0	-3.5	0.101
<b>Leverage</b>										
LEV	96	-0.046	0.000	0.399	<b>0.128</b>	<b>0.213</b>	<b>0.003</b>	-0.035	-0.003	0.670



## 6. Summary and Concluding Remarks

Regarding profitability, Wilcoxon tests show the statistically significant increases in median value of ROA and ROS after equitization. Furthermore, PSM-DID method reports that the ROS 1 year after equitization of equitized firms is significantly higher than that of non-equitized SOEs.

Regarding efficiency, our results show the statistically significant increase in sales efficiency and net income efficiency after equitization. Furthermore, PSM and PSM-DID methods report that the sales efficiency of equitized firms is significantly higher than that of non-equitized SOEs.

Regarding output, PSM-DID method reports that the real sales 1 year after equitization of equitized firms is significantly higher than that of non-equitized SOEs.

Regarding employment, our results show the statistically significant decrease in the total number of employees after equitization. Furthermore, PSM and PSM-DID methods report that the total number of employees of equitized firms is significantly higher than that of non-equitized SOEs.

Regarding financial leverage, PSM method shows that the debt over asset ratio of equitized firms is significantly higher than that of non-equitized SOEs.

Regarding our subsamples, SMEs are expected to restructure and reorganize more easily than large businesses. PSM-DID method shows that the profitability, net income per employee 1 year after equitization and real sales 2 years after equitization of equitized SMEs are significantly higher than those of similar non-equitized SMEs while there is no significant result for equitized large businesses.

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