

“Tax incentive policy and firm performance: evidence from Vietnam”

AUTHORS

Trinh Quoc Trung  <https://orcid.org/0000-0002-7031-4895>

Nguyen Van Tan  <https://orcid.org/0000-0003-2795-8617>

ARTICLE INFO

Trinh Quoc Trung and Nguyen Van Tan (2020). Tax incentive policy and firm performance: evidence from Vietnam. *Investment Management and Financial Innovations*, 17(2), 277-296. doi:[10.21511/imfi.17\(2\).2020.22](https://doi.org/10.21511/imfi.17(2).2020.22)

DOI

[http://dx.doi.org/10.21511/imfi.17\(2\).2020.22](http://dx.doi.org/10.21511/imfi.17(2).2020.22)

RELEASED ON

Wednesday, 01 July 2020

RECEIVED ON

Tuesday, 14 April 2020

ACCEPTED ON

Friday, 19 June 2020

LICENSE



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

JOURNAL

"Investment Management and Financial Innovations"

ISSN PRINT

1810-4967

ISSN ONLINE

1812-9358

PUBLISHER

LLC “Consulting Publishing Company “Business Perspectives”

FOUNDER

LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

40



NUMBER OF FIGURES

0



NUMBER OF TABLES

14

© The author(s) 2026. This publication is an open access article.


BUSINESS PERSPECTIVES


LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 14th of April, 2020

Accepted on: 19th of June, 2020

Published on: 1st of July, 2020

© Trinh Quoc Trung,
Nguyen Van Tan, 2020

Trinh Quoc Trung, Manager/Associate
Professor, University of Economics
and Law, Ho Chi Minh City, Vietnam;
Vietnam National University, Ho Chi
Minh City, Vietnam.

Nguyen Van Tan, MBA/Lecturer,
Becamex Business School, Eastern
International University, Vietnam.
(Corresponding author)

Trinh Quoc Trung (Vietnam), Nguyen Van Tan (Vietnam)

TAX INCENTIVE POLICY AND FIRM PERFORMANCE: EVIDENCE FROM VIETNAM

Abstract

This paper aims to assess the impact of the tax incentive policy on firm performance after privatization in Vietnam. Using research data of 260 privatized enterprises in Vietnam, this study sheds light on whether tax incentive policies can help improve firm performance after privatization. The paper utilizes a pre-post comparison approach proposed by Megginson, Nash, and Van Randenborgh (1994). The research results reveal that privatized enterprises with tax incentives have improved profitability (ROA, ROE, ROS) and operating efficiency (NIEFF) and reduced leverage after privatization. A statistical reduction in the number of employed and an improvement in output (real income) after privatization are not observed. Besides, there is no statistical evidence proving that privatized enterprises have experienced significant changes in standard deviations of firm performance measures after privatization in Vietnam. Given significant improvements in the profitability of post-privatized enterprises with tax incentives, the authors propose some managerial implications for the Vietnamese government, investors and non-privatized state-owned enterprises (SOEs).

Keywords

privatization, efficiency, difference-in-difference, state-owned enterprises

JEL Classification

P31, G32, H25

INTRODUCTION

Privatization in Vietnam includes three phases; the third phase started in 2008. However, the number of enterprises participating in privatization dropped sharply during the third phase because small and medium-sized SOEs were privatized earlier in the first two phases.

Megginson (2017), Estrin and Pelletier (2018) argue that the impact of privatization on firm performance attracts researchers because they have conflicting results about the impact of privatization, and the privatization process is still incomplete in China, Vietnam, and some other transition economies. Empirical studies in developed countries include research works by Megginson, Nash, and Van Randenborgh (1994), Sakr (2014), and Alipour (2013), while in developing and transition economies they include Boubakri, Cosset, and Guedhami (2008). Iwasaki and Mizobata (2018), Bachiller (2017) use a meta-analysis to explore the impact of privatization on firm performance.

Pham (2017, 2019), Sakr (2014), Alipour (2013), Loc, Lanjouw, and Lensink (2006), and Tran, Nonneman, and Jorissen (2015) compare changes in firm performance of privatized SOEs in Vietnam. Hung, Thien, and Liem (2017) compare firm performance between privatized SOEs and private firms. In general, these studies only consider inflation when calculating output (real sales), but they do not consider inflation when calculating operating efficiency (sales efficiency, net income efficiency), so conclusions about improving operating efficiency are inconsistent. Megginson



This is an Open Access article,
distributed under the terms of the
[Creative Commons Attribution 4.0
International license](https://creativecommons.org/licenses/by/4.0/), which permits
unrestricted re-use, distribution, and
reproduction in any medium, provided
the original work is properly cited.



Conflict of interest statement:

Author(s) reported no conflict of interest

et al. (1994) and Alipour (2013) only consider inflation using the consumer price index (CPI) when calculating real revenue and sales efficiency, while calculation of profitability and assets are needed to use inflation. Previous studies by Pham (2017) and Sakr (2014) mainly use a pre-post comparison method (comparing firm performance changes after privatization with a pre-privatization period). The previous studies mainly assess changes in mean and median of firm performance measures using the t-Test and Mann-Whitney U test. However, they have not considered variations of firm performance measures after privatization compared to a pre-privatization period. Firstly, this paper examines changes in standard deviations of firm performance measures through four-year privatization windows. Second, it assesses the impact of tax incentive policies on firm performance of privatized enterprises. And the third contribution is that it considers inflation to measure output and operating efficiency of privatized SOEs in Vietnam.

1. LITERATURE REVIEW

Dewenter and Malatesta (2001) compare the performance of 63 large-scale enterprises in the Fortune 500 report from 1981 to 1993 and confirm a significant increase in profitability and a decrease in financial leverage and labor after privatization. According to Harper (2002), privatization helps SOEs to be more efficient in profitability, productivity, and ability to utilize capital in the Czech Republic in general. Rakhman (2018) argues that partially privatized SOEs perform at least as effective as private firms for 13 consecutive years in Indonesia.

Brown, Earle, and Telegdy (2016) use a data set of 70,000 firms in five East European economies and find that privatization raises measures of profitability, productivity and growth. Arocena et al. (2012) and Mager and Jesswein (2010) conclude that firms significantly increase real sales, become more profitable, and improve their operating efficiency after being privatized. Amess and Roberts (2007) show that before privatization, state-owned SOEs have lower labor productivity than state-owned enterprises in Poland. Farinos, Garcia, and Ibanez (2007) also find that there are significant operating improvements in Spanish SOEs after privatization. Bachiller (2012) concludes that only the performance of companies in the utility industry is significantly better after privatization in European companies. However, McKenzie and Keneley (2011), Aussenegg and Jelic (2007) and Farinos et al. (2007) find that there are no significant improvements in the profitability and efficiency of privatized SOEs.

Boubakri, Cosset, and Guedhami (2008) argue that in developing countries privatized enterprises have increased profitability, net sales, investment

capital, productivity, labor productivity, and dividend payout and decreased debt level. Privatization has a positive impact on the firm performance of the aviation industry in the Kenyan aviation industry, with specific reference to Kenya Airways Limited (Ochieng & Ahmed, 2014). The research result is consistent with the study by Sakr (2014). However, Alipour (2013) explains that privatization does not have a positive effect on the profitability (ROS, ROE, and ROA) of the firms listed on the Tehran Stock Exchange; instead, the effect has been negative. Oqdeh and Abu Nassar (2011) also find that there is no significant increase in profitability after privatization at both full samples, as well as sub-samples level.

Wei, Varela, D'Souza, and Hassan (2003), Huang and Song (2005) find an increase in production, sales efficiency, and a reduction in financial leverage in China. However, Liao, Liu, and Wang (2014) find that privatization does not improve operating efficiency and corporate governance. However, the authors confirm that firm operating revenue increases significantly after the reform. Tu, Lin, and Liu (2013) explain that there is a political connection after privatization in China. Privatization in China does not help reduce the dominant role of the State in privatized firms (Gan, 2009). This result is consistent with research work by Jiang, Yue, and Zhao (2009).

Loc et al. (2006) state that there is an improvement in firm performance after privatization in Vietnam, including profitability and operating efficiency; besides, privatized SOEs tend to reduce leverage and labor after privatization. Hung et al. (2017) argue that privatized firms have a higher ROE than private firms because privatized firms are easier to issue shares after privatization. Tran et al. (2015)

Table 1. Summary of testable mean predictions for privatized SOEs with tax incentives

Variable	Proxy	Predicted relationship (after-before)
P(1) Profitability	Return on Sales (ROS)	$ROS_A > ROS_B$
	Return on Assets (ROA)	$ROA_A > ROA_B$
	Return on Equity (ROE)	$ROE_A > ROE_B$
P(2) Operating efficiency	Sales Efficiency (SALEF)	$SALEFF_A > SALEFF_B$
	Net Income Efficiency (NIEFF)	$NIEFF_A > NIEFF_B$
	Total Assets Turnover (TAS)	$TAS_A > TAS_B$
P(3) Output	Real Sales (RSAL)	$RSAL_A > RSAL_B$
P(4) Employment	Total Employment (EMPL)	$EMPL_A < EMPL_B$
P(5) Leverage	Debt to Assets (LV)	$LEV_A < LEV_B$

show that privatized firms perform better after privatization, especially in terms of profitability. However, there is a reduction in profitability and an improvement in working capital management or financial leverage of privatized SOEs in Vietnam (Pham, 2017; Pham & Nguyen, 2019).

However, most of the above studies have not examined how tax incentive policy helps privatized SOEs improve firm performance. Radygin (2014) argues that countries use several incentive policies to speed up the privatization process, and this leads to stagnation in the financial market development. Aslund (2013) argues that privatization incentive policies have a positive effect on the performance of privatized SOEs, but these policies are likely to lead to unfair competition for businesses.

Vietnamese government issued Decree No. 164/2003/ND-CP on December 22rd, 2003, detailing the implementation of the Law on Enterprise Income Tax (CIT). According to this Decree, privatized SOEs could get a deduction of 100% corporate income tax for the first two years and a reduction of 50% corporate income tax for the next two years if these SOEs participated in privatization programs from 2004 to 2007. The tax incentive policy for privatized SOEs is

also one characteristic in Vietnam. This policy directly affected profit after tax and reinvestment activities of privatized SOEs in this period. Therefore, the first hypothesis is as follows:

H1: Only state-owned enterprises with incentives significantly improve firm performance after privatization.

Cuervo and Villalonga (2000) explain that the firm performance of privatized enterprises depends on privatization methods, business strategies, and ownership structure. Therefore, the firm performance of equitized SOEs in the post-privatization period may be unstable compared to the pre-privatization period due to competition with private enterprises. Therefore, this study also assesses the stability of firm performance by examining changes in the standard deviations of firm performance measures through four-year privatization windows in Vietnam. Iwasaki and Mizobata (2018) also conclude that differences between countries in location, a privatization method, and speed of policy implementation strongly affect firm performance. Based on the research results by Cuervo and Villalonga (2000), Iwasaki and Mizobata (2018) and Bachiller (2017) that privatized enterprises operate unstably

Table 2. Summary of testable standard deviation predictions

Variable	Proxy	Predicted relationship (after-before)
P(1) Standard deviation of Profitability	The standard deviation of Return on Sales (SROS)	$SROS_A > SROS_B$
	The standard deviation of Return on Assets (SROA)	$SROA_A > SROA_B$
	The standard deviation of Return on Equity (SROE)	$SROE_A > SROE_B$
P(2) Standard deviation of Operating efficiency	The standard deviation of Sales Efficiency (SSALEF)	$SSALEFF_A > SSALEFF_B$
	The standard deviation of Net Income Efficiency (SNIEFF)	$SNIEFF_A > SNIEFF_B$
	The standard deviation of Total Assets Turnover (STAS)	$STAS_A > STAS_B$
P(3) Standard deviation of Output	The standard deviation of Real Sales (SRSAL)	$SRSAL_A > SRSAL_B$
P(4) Standard deviation of Employment	The standard deviation of Total Employment (SEEMPL)	$SEEMPL_A > SEEMPL_B$
P(5) Standard deviation of Leverage	The standard deviation of Debt to Assets (SLV)	$SLEV_A > SLEV_B$

with various improvements in firm performance after privatization, the authors propose the second research hypothesis:

H2: Both for privatized enterprises with tax incentives and without tax incentives, there are different variations in the firm performance of privatized SOEs between the two privatization windows.

2. METHODS

2.1. Data

The data set includes the firm performance information from survey results of the General Statistics Office, Vietnam. The data set includes 260 SOEs privatized from 2006 to 2014. The paper provides data on the privatized enterprises up to 2014 to ensure that there are four years after this point to calculate the mean value of firm performance after privatization.

2.2. Methodology and measurement

This paper adopts the pre-post comparison method with four-year privatization windows to measure changes in firm performance.

Unlike previous studies in Vietnam, this study uses the World Bank's CPI with the base year of 2010 to calculate net sales, real assets, and net profit after tax before calculating firm performance meas-

ures. The paper also uses total assets turnover proposed by Huang and Song (2005). Thus, the following measures are applied, presented in Table 3.

3. RESULTS

3.1. Descriptive statistics

Table 4 shows that most of the privatized SOEs belong to the manufacturing and construction industries with 143 enterprises (accounting for 55%), followed by privatized SOEs in the service sector, including 106 enterprises (accounting for 40.77%).

The sample includes 260 SOEs privatized in the second and third privatization phases in Vietnam, in which large-scale enterprises make up the majority with 204 enterprises (accounting for 78.46%). The sample is also divided by listing status and tax incentives. Table 4 shows that most privatized SOEs are unlisted (accounting for 63.46%).

Table 5 shows that privatized SOEs have considerable differences in operating efficiency, the number of employees, and output based on standard deviations. Privatized SOEs have a high average output, reaching nearly VND 766,226.4 million, which shows that most of SOEs in the sample are large-scale ones. SOEs also have significant differences in firm performance, reflected in the standard deviation and maximum values.

Table 3. Variable measurement

Variable	Proxy
P(1) Profitability	Return on Sales (ROS) = Real Net Profit/Real Sales
	The standard deviation of Return on Sales (SROS)
	Return on Assets (ROA) = Real Net Profit/Real Total Assets
	The standard deviation of Return on Assets (SROA)
	Return on Equity (ROE) = Real Net Profit/Real Equity
	The standard deviation of Return on Equity (SROE)
P(2) Operating efficiency	Sales Efficiency (SALEF) = Real Sales/Number of Employees
	The standard deviation of Sales Efficiency (SSALEF)
	Net Income Efficiency (NIEFF) = Real Net Income/Number of Employees
	The standard deviation of Net Income Efficiency (SNIEFF)
	Total Assets Turnover (TAS) = Real Sales/Total Real Assets
	The standard deviation of Total Assets Turnover (STAS)
P(3) Output	Real Sales (RSAL) = Nominal Sales/CPI
	The standard deviation of Real Sales (SRSAL)
P(4) Employment	Total Employment (EMPL) = Total Number of Employees
	The standard deviation of Total Employment (SEMP)
P(5) Leverage	Debt to Assets (LV) = Total Debt/Total Assets
	The standard deviation of Debt to Assets (SLV)

Table 4. Frequency statistics

Source: Authors' compilation.

Characteristics	Frequency	Percentage (%)	Cumulative percentage (%)
Industry groups			
Agriculture, fishery, and mining	11	4.23	4.23
Manufacturing and construction	143	55.00	59.23
Service	106	40.77	100.00
Firm size			
Small and medium-sized SOEs	56	21.54	21.54
Large scale SOEs	204	78.46	100.00
Listing status			
Unlisted	165	63.46	63.46
Listed	95	36.54	100.00
Tax incentives			
Without tax incentives	118	45.38	45.38
With tax incentives	142	54.62	100.00
Total	260	100.00	

Table 5. Descriptive statistics

Source: Authors' compilation.

Variable	Mean	Standard deviation	Min	Max
ROS	0.023	0.114	-0.778	0.676
ROA	0.028	0.0614	-0.265	0.571
ROE	0.083	0.274	-1.896	1.804
SALEFF	3,504.948	33,489	20.931	525,788.9
NIEFF	41.145	225.846	-513.152	3,861.182
TAS	1.347	1.471	0.061	11.953
RSAL	766,226.4	6,786,577	449.074	1.12x10 ⁰⁸
EMPL	504.014	760.835	7.75	7,823.25
LEV	0.669	0.358	0.013	3.655
SROS	0.068	0.326	0.000	6.458
SROA	0.037	0.106	0.000	1.813
SROE	0.169	0.455	0.000	6.707
SSALEF	1,969.883	28,290.96	1.894	637,544
SNIEFF	64.506	216.394	0	3,150.961
STAS	0.765	4.858	0.008	94.446
SRSAL	275,746.7	2,199,666	160.559	4.26x10 ⁰⁷
SEMP	108.720	243.833	0	4,041
SLV	0.150	0.646	0.003	13.648

The number of observations is 520

Note: Employment unit is the number of employees; real sales and asset units are in millions VND, and other units are in percentage.

3.2. Changes in firm performance of privatized SOEs with corporate income tax incentives

Profitability

Statistical results in Table 6 show that privatized SOEs with tax incentives have significant improvements in performance, including profitability (ROS, ROA, and ROE), and operating effi-

ciency (NIEFF). Privatized enterprises have a significant increase in profitability. Specifically, ROS increased by 2.7%, ROA increased by 2.8%, and ROE increased by 11.6% after privatization. The results of this study are similar to Dewenter and Malatesta (2001), who show that privatized firms improved 4.6% of ROS and 1.1% of ROA after privatization (for three-year privatization windows). The research results are quite similar to the research work of Brown et al. (2016), Mager and Jesswein (2010).

Table 6. Testing results of predictions for privatized SOEs with corporate income tax incentives

Source: Authors' compilation.

Variable	Mean before (Median)/ Std before (Median)	Mean after (Median)/ Std after (Median)	Mean change (Median)/Std change (Median)	t-test for Difference in Means/ Std (Before- After)	Mann-Whitney test (z) for Difference in Medians/ of means/ Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/ Medians of Std (Before-After)
(P1) Profitability						
ROS	0.008 (0.007)	0.035 (0.026)	-0.027** (-0.019)***	-2.167 (0.031)	-6.053 (0.000)	0.292***
	0.062 (0.009)	0.081 (0.016)	-0.019 (-0.007)***	-0.395 (0.693)	-2.626 (0.008)	0.410***
ROA	0.0138 (0.007)	0.042 (0.029)	-0.0282*** (-0.022)***	-4.428 (0.000)	-6.056 (0.000)	0.292***
	0.031 (0.009)	0.031 (0.017)	0.000 (-0.008)***	-0.064 (0.949)	-3.652 (0.000)	0.375***
ROE	0.013 (0.038)	0.129 (0.128)	-0.116*** (-0.090)***	-3.302 (0.001)	-5.506 (0.000)	0.311***
	0.214 (0.054)	0.156 (0.055)	0.058 (-0.001)	1.129 (0.259)	-1.150 (0.250)	0.461
(P2) Operating efficiency						
SALEFF	710.477 (266.582)	3,213.451 (411.093)	-2,502.974 (-144.511)***	-1.149 (0.252)	-3.199 (0.001)	0.390***
	234.166 (85.395)	4,909.892 (98.095)	-4,675.726 (-12.7)*	-1.042 (0.299)	-1.829 (0.067)	0.437*
NIEFF	10.350 (4.280)	54.587 (12.755)	-44.237*** (-8.475)***	-2.622 (0.009)	-5.036 (0.000)	0.327***
	54.158 (15.994)	53.980 (13.662)	0.178 (2.332)	0.011 (0.990)	-0.340 (0.734)	0.488
TAS	1.383 (0.985)	1.443 (1.068)	-0.06 (-0.083)	-0.354 (0.723)	-0.997 (0.318)	0.466
	0.361 (0.243)	0.522 (0.258)	-0.161** (-0.015)	-1.938 (0.054)	-1.025 (0.306)	0.465
(P3) Output						
R SAL	272,126.8 (92,787.87)	292,313.3 (26,936.11)	-20,186.5 (65,851.76)***	-0.118 (0.906)	5.912 (0.000)	0.703***
	72,160.79 (25,501.46)	403,179.7 (20,530.46)	-331,018.91 (4,971)	-1.101 (0.273)	-0.040 (0.968)	0.499
(P4) Employment						
EMPL	570.562 (279)	438.915 (227.5)	131.647 (51.5)*	1.492 (0.137)	1.890 (0.059)	0.565*
	113.266 (51.196)	93.202 (20.756)	20.064 (30.44)***	1.089 (0.276)	2.837 (0.004)	0.597***
(P5) Leverage						
LEV	0.765 (0.793)	0.674 (0.722)	0.091*** (0.071)***	2.975 (0.003)	2.860 (0.004)	0.598***
	0.104 (0.050)	0.147 (0.092)	-0.043 (-0.042)***	-1.185 (0.237)	-4.449 (0.000)	0.347***

Note: *, ** and *** mean significance at 10%, 5%, and 1%, respectively. The number of observations is 520. Employment unit is the number of employees, real sales and asset units are in millions VND, and other units are in percentage.

Boubakri et al. (2008) confirm that privatized enterprises have improved profitability (ROS, ROE, and ROA) after privatization in developing countries. The results of this study are quite similar to the study by Ochieng and Ahmed (2014). However, Aussenegg and Jelic (2007) find that privatized firms experience no improvement in profitability in the Czech Republic. This study has many similarities with those by Farinos et al. (2007) in Spain. Alipour (2013) explains that privatization does not have a positive effect on the profitability (ROS, ROE, and ROA) of the firms listed on the Tehran Stock Exchange. Oqdeh and Abu Nassar (2011) find that there is no significant increase in profitability after privatization. The state still holds a significant number of shares and dominates operations of privatized SOEs in China, so it is challenging to improve firm performance after privatization (Wei et al., 2003).

Operating efficiency

There are no improvements in operating efficiency (SALEFF) and Total Assets Turnover (TAS) after privatization because the output is not improved (RSAL). However, NIEFF is increased by VND 44.237 million/employed after privatization because tax incentive policies help privatized SOEs increase net income, while there is no significant change in labor after the privatization of privatized SOEs with tax incentives.

Meanwhile, previous studies in developed and developing countries show that there is an increase in the operating efficiency of privatized enterprises, including operating efficiency (SALEFF) and TAS (Farinos et al., 2007; Huang & Song, 2005; Loc et al., 2006; Loc & Tran, 2016; Mager & Jesswein, 2010). However, this research result is quite similar to studies by Liao et al. (2014), Tu et al. (2013); these authors explain that there is a political connection after privatization within privatized SOEs in China, and this makes it difficult for privatized SOEs to improve their performance after privatization.

Output

When considering the inflation rate in Vietnam (CPI) to determine real sales of privatized SOEs, the results from Table 6 show that privatized en-

terprises with tax incentives in Vietnam do not improve their output (real sales) after privatization. Thus, the results of this research are not consistent with previous studies in Vietnam by Loc et al. (2006) and Hung et al. (2017). However, the research results are generally similar to studies by Carlin and Pham (2009), and Pham and Nguyen (2019).

Employment

Privatized SOEs with tax incentives do not reduce the number of employees in Vietnam after privatization because they have advantages from the tax incentive program. The results of this research are inconsistent with most previous studies in developed and developing countries, and in Vietnam. Dewenter and Malatesta (2001), Amess and Roberts (2007) argue that post-privatization firms often reduce labor because of pursuing the goal of maximizing profits and reducing labor costs or even modernizing production.

Leverage

Table 6 also shows that there is evidence to confirm a change in leverage after privatization compared to the post-privatization period. Privatized SOEs with tax incentives reduce the use of debt after privatization because they change their objectives from maximizing revenue to maximizing profits and using lower leverage in the post-privatization period, thereby reducing debts and production costs (leverage decreased by 9.1%). The results of this study also contradict conclusions of previous studies that the post-privatization enterprises would be more likely to use debt when issuing shares, leading to expanding operations (Carlin & Pham, 2009; Pham, 2017; Pham & Nguyen, 2019). The results of this study are different from other research in both developed (Dewenter & Malatesta, 2001) and developing countries (Chen, Firth, & Rui, 2006; Loc et al., 2006; Loc & Tran, 2016).

There is also no evidence of changes in standard deviation values of firm performance measures through four-year privatization windows (except for an increase in the standard deviation of TAS by 16.1%). Thus, privatized enterprises do not significantly change much in firm performance measures after privatization.

Table 7. Testing results of predictions for privatized SOEs without corporate income tax incentives

Source: Authors' compilation

Variable	Mean before (Median)/ Std before (Median)	Mean after (Median)/Std after (Median)	Mean change (Median)/ Std change (Median)	t-test for Difference in Means/Std (Before-After)	Mann-Whitney test (z) for Difference in Medians of means/ Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/ Medians of Std (Before-After)
(P1) Profitability						
ROS	0.020 (0.019)	0.028 (0.033)	-0.008 (-0.014)**	-0.515 (0.607)	-2.271 (0.023)	0.414**
	0.041 (0.017)	0.091 (0.018)	-0.05** (-0.001)	-2.091 (0.038)	-0.744 (0.457)	0.472
ROA	0.022 (0.019)	0.037 (0.022)	-0.015* (-0.003)	-1.776 (0.077)	-1.308 (0.191)	0.451
	0.042 (0.017)	0.0472 (0.016)	-0.0052 (0.001)	-0.278 (0.781)	-0.046 (0.963)	0.498
ROE	0.088 (0.061)	0.106 (0.074)	-0.018 (-0.013)	-0.569 (0.569)	-0.818 (0.413)	0.469
	0.199 (0.051)	0.102 (0.039)	0.097 (0.012)	1.560 (0.121)	0.883 (0.377)	0.533
(P2) Operating efficiency						
SALEFF	5,473.328 (335.173)	5,250.188 (488.495)	223.14 (-153.322)**	0.037 (0.970)	-2.233 (0.025)	0.416**
	982.106 (76.419)	1508.427 (111.574)	-526.321 (-35.155)*	-0.606 (0.545)	-1.823 (0.068)	0.431*
NIEFF	60.156 (6.625)	43.017 (13.727)	17.139 (-7.102)**	0.444 (0.657)	-2.210 (0.027)	0.417**
	49.265 (9.259)	104.865 (14.379)	-55.6 (-5.12)	-1.490 (0.138)	-0.891 (0.373)	0.466
TAS	1.3481 (0.905)	1.187 (0.903)	0.1611 (0.002)	0.814 (0.416)	1.005 (0.315)	0.538
	1.757 (0.205)	0.549 (0.179)	1.208 (0.026)	1.297 (0.197)	1.163 (0.245)	0.544
(P3) Output						
SAL	1,422,728 (111,503.9)	1,274,622 (98,697.19)	148,106 (12,806.71)	0.114 (0.909)	0.092 (0.927)	0.503
	284,852.2 (23,952.62)	358,282.8 (26,010.3)	-73,430.6 (-2,057.68)	-0.327 (0.743)	0.069 (0.945)	0.503
(P4) Employment						
EMPL	596.468 (298.625)	409.816 (249.75)	186.652* (48.875)	1.845 (0.066)	1.632 (0.103)	0.561
	108.275 (37.884)	122.368 (29.165)	-14.093 (8.719)	-0.338 (0.736)	1.446 (0.148)	0.554
(P5) Leverage						
LEV	0.590 (0.593)	0.627 (0.577)	-0.037 (0.016)	-0.643 (0.521)	0.587 (0.557)	0.522
	0.147 (0.078)	0.213 (0.062)	-0.066 (0.016)	-0.565 (0.573)	1.428 (0.153)	0.554

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The number of observations is 236. Employment unit is the number of employees; real sales and asset units are in millions VND, and other units are in percentage.

Table 7 shows that privatized enterprises without tax incentive policies do not have an increase in profitability and operating efficiency after privatization in Vietnam. This result is consistent with the studies by Aussenegg and Jelic (2007), Wei et al. (2003), Carlin and Pham (2009), Pham (2017), and Pham and Nguyen (2019). Wei et al. (2003) argue that firms do not significantly increase in profit after privatization in China. Chen et al. (2006) also conclude that the profitability of enterprises decreases after five years of privatization in China.

The results of the t-test and the Mann-Whitney test show that there is no significant change in real sales, leverage of privatized enterprises with no tax incentives. The number of employees of these enterprises tends to decrease by 186,652 employees on average. These results generally coincide with studies in China, such as Wei et al. (2003) and Chen et al. (2006). These researchers explain that privatized SOEs are still under the control of the state in China, so firm performance is difficult to improve in the short term. Gan (2009) also concludes that privatization does not help reduce the dominant role of the state in privatized firms in China as most privatized enterprises remain state-owned or at least there is a political connection with post-privatized enterprises.

3.3. Firm performance changes by industry groups, listing status, and firm size

If considered by industry groups, privatization does not help privatized SOEs with tax incentives in agriculture, fishing, and aquaculture, and mining sectors improve firm performance after privatization (Appendix A1). The results also show that there is no evidence of changes in the standard deviations of firm performance measures. However, privatized enterprises in manufacturing and construction have a significant improvement in performance, in particular, profitability (ROS increased by 3.5%, ROA increased by 3.4%, ROE increased by 13.0%) and operating efficiency (SALEFF increased by VND 240.230 million/employee) after privatization (Appendix A2). These enterprises also tend to decrease real sales by VND 110,234.560 million and to reduce the number of employees after privatization (185.964 employees on average) in order to focus on maximizing profits and re-

structuring business activities. Enterprises in the manufacturing and construction sectors also tend to reduce their leverage ratio (by 11.7%) after privatization by reducing debt to total assets to avoid operational risks. However, these privatized SOEs do not improve output (real sales) due to operational restructuring and debt reduction after privatization. The research results also show that these enterprises do not change standard deviations of firm performance measures in general (except for ROA, SALEFF), which shows that privatized enterprises do not have many breakthrough changes in their operations.

Similarly, privatized SOEs in the services sector do not change much in terms of firm performance after privatization. There is a significant improvement in profitability (ROA increased by 2.1%) and operating efficiency (NIEFF increased by VND 81.277 million/employee) (Appendix A3). However, privatized SOEs in the services sector do not improve their operating efficiency (SALEFF, TAS) and output (RSAL) after privatization. Also, research results show that there is no evidence that service enterprises reduce labor and leverage after privatization.

Manufacturing, construction, and service enterprises with tax incentives have improvements in profitability and operating efficiency. This result is consistent with the fact that state representatives still hold relatively high ownership of enterprises after privatization, along with the ability to adapt to the low competitive environment of newly privatized enterprises. A vital theory that explains the competitiveness of the environment affecting businesses and a country is Porter's competitive advantage theory (Porter, 1990). Sheshinski and López-Calva (2003) and Megginson (2017) also suggest that enterprises involved in privatization in highly competitive industries experience significant improvements in performance if compared to enterprises in less competitive industries.

In terms of listing status, unlisted SOEs have an improvement in profitability (ROA increased by 2.3% and ROE increased by 9.2%) and operating efficiency (SALEFF increased by VND 274.157 million/employee, NIEFF increased by 10.873 million VND/employee) (Appendix A4). Meanwhile, listed companies improve in profitability (ROS

increased by 3.7%, ROA increased by 4.1%, and ROE increased by 16.4%) (Appendix A5). Listed privatized SOEs also improve operating efficiency (NIEFF increased by VND 113.869 million/employee). Both listed and unlisted firms use less debt than during the pre-privatization period because of better shareholder control. A common point between unlisted and listed firms is that both groups of privatized SOEs have not improved much in terms of output (RSAL) after privatization. Also, the standard deviations of firm performance measures do not significantly change much through the four-year privatization windows (except for SALEFF, TAS, and EMPL of unlisted firms), and this result shows that privatized SOEs do not have many breakthrough changes in their operations after privatization.

Considering the firm size, small and medium-sized enterprises do not improve firm performance after privatization (Appendix A6). They also do not improve output and do not reduce leverage after privatization, while there is a reduction in labor after privatization (47.208 employees on average). Thus, privatization does not help small and medium-sized enterprises improve their performance, and these enterprises are often in the agriculture and fishery sectors with a low competitive business environment. However, large-scale SOEs are likely to improve their performance after privatization. Large-scale enterprises improve profitability (ROS increased by 3.7%, ROA increased by 3.6%, and ROE increased by 12.2%) (Appendix A7). There is also a significant improvement in the operating efficiency of large-scale SOEs (NIEFF increased by 55.383 million VND/employee).

Large-scale enterprises are often state-owned corporations but belong to highly competitive industries, so they operate more effectively after privatization. Large-scale enterprises also tend to reduce 187,594 employees on average after privatization to reorganize production and business activities, reduce labor costs, and reduce leverage (LEV decreased by 9%). Thus, large-scale enterprises also cut costs and reduce risks after privatization. Also, changes in standard deviations of firm performance measures through four-year privatization windows are not statistically significant in general (except for standard deviation changes in ROA and LEV of large-scale privatized SOEs).

4. DISCUSSION

In general, the study affirms to accept one part of the first hypothesis when privatized enterprises with tax incentives have improved profitability (ROA, ROE, and ROS), operating efficiency (NIEFF), and reduced leverage after privatization. Also, there is no statistical reduction in the number of employed and no improvement in output (real revenue) after privatization. Privatized SOEs without tax incentives do not have significant improvements in profitability (except for ROA) and operating efficiency. Aslund (2013) argues that privatization incentive policies have a positive effect on the performance of privatized enterprises. The results of this research are inconsistent with previous studies in Vietnam by Loc et al. (2006) and Hung et al. (2017) because most of these studies do not use inflation when calculating firm performance measures.

However, the research results are generally similar to studies by Carlin and Pham (2009), Pham (2017), and Pham and Nguyen (2019). Aussenegg and Jelic (2007) prove that privatized firms experience no improvement in profitability, capital investment, efficiency, and output, a significant drop in employment, as well as a significant increase in leverage. The results of this research are consistent with some empirical research works in developed and developing countries. Farinos et al. (2007) find that there are no significant improvements in Spanish privatized firms' profitability and efficiency. Wei et al. (2003) conclude that there is an increase in production, sales efficiency, and a reduction in financial leverage in China. Chen et al. (2006) state that the profitability of enterprises decreases after five years of privatization. A decline in firm performance is due to a political connection after privatization in China (Tu et al., 2013). Gan (2009) and Jiang et al. (2009) explain that privatization in China does not help reduce the dominant role of the state in privatized firms as most privatized enterprises remain state-owned or at least there is a political relationship with post-privatized enterprises.

As a result, the authors reject the second hypothesis when there are no statistics proving that privatized enterprises have significant changes in standard deviations of firm performance measures after privatization in Vietnam (except for the change in

the standard deviation of TAS for privatized SOEs with tax incentives). This result is inconsistent with the results by Cuervo and Villalonga (2000), Iwasaki and Mizobata (2018), and Bachiller (2017). Research results also show that improvements in firm performance vary according to industry groups, listing status, and firm size of privatized SOEs with tax incentives.

CONCLUSION

The research results show that the tax incentive policy significantly helps state-owned enterprises improve firm performance after privatization. Given significant improvements in the profitability and operating efficiency of post-privatized enterprises with tax incentives, some policy implications are proposed.

The Vietnamese government should speed up the privatization program because the enterprises after privatization still have a significant increase in profitability in some cases. Privatized enterprises have the opportunity to participate in the market mechanism after privatization, which is no longer subject to the State's control, so that firm performance will be significantly improved in the long run. The Vietnamese state should not continue other incentive policies for privatized SOEs because it created an unfair competition environment with private firms and privatized SOEs with incentive policies that cannot adapt to a competitive business environment.

Investors should not consider investing in short-term IPO transactions because privatized enterprises cannot improve much in the short term. However, investors need to carefully consider whether to invest in an IPO, as enterprises are usually not listed immediately after privatization in Vietnam, which forces investors to wait long for the initial abnormal returns to sell shares on the secondary market.

Non-privatized SOEs should continue to actively register for privatization, if not yet implemented, because privatization also helps to significantly increase profitability in the long run. Managers of non-privatized enterprises should set appropriate objectives and long-term strategies after privatization because they have to compete with private enterprises and foreign-invested enterprises in the same sectors after privatization.

This paper analyzes whether the tax incentive policy helps improve firm performance of privatized SOEs after privatization in Vietnam. However, it does not consider the impact of privatization on firm performance of privatized SOEs when considering both privatized SOEs and non-privatized SOEs.

AUTHOR CONTRIBUTIONS

Conceptualization: Trinh Quoc Trung.

Data curation: Nguyen Van Tan.

Formal analysis: Nguyen Van Tan.

Investigation: Nguyen Van Tan, Trinh Quoc Trung.

Methodology: Nguyen Van Tan, Trinh Quoc Trung.

Project administration: Trinh Quoc Trung.

Resources: Trinh Quoc Trung.

Software: Nguyen Van Tan.

Supervision: Trinh Quoc Trung.

Validation: Trinh Quoc Trung.

Visualization: Nguyen Van Tan.

Writing – original draft: Nguyen Van Tan.

Writing – review & editing: Nguyen Van Tan, Trinh Quoc Trung.

REFERENCES

1. Alipour, M. (2013). Has privatization of state-owned enterprises in Iran led to improved performance?. *International Journal of Commerce and Management*, 23(4), 281-305. <https://doi.org/10.1108/IJCo-MA-03-2012-0019>
2. Amess, K., & Roberts, B. M. (2007). The productivity effects of privatization: The case of Polish cooperatives. *International Review of Financial Analysis*, 16(4), 354-366. <https://doi.org/10.1016/j.irfa.2007.03.005>
3. Aslund, A. (2013). *How capitalism was built: the transformation of Central and Eastern Europe, Russia, the Caucasus, and Central Asia*: Cambridge University Press.
4. Aussenegg, W., & Jelic, R. (2007). The operating performance of newly privatised firms in Central European transition economies. *European Financial Management*, 13(5), 853-879. <https://doi.org/10.1111/j.1468-036X.2007.00400.x>
5. Bachiller, P. (2012). The impact of privatization on economic performance in European companies. *Journal des Economistes et des Etudes Humaines*, 18(1). <https://doi.org/10.1515/1145-6396.1252>
6. Bachiller, P. (2017). A meta-analysis of the impact of privatization on firm performance. *Management Decision*, 55(1), 178-202. <https://doi.org/10.1108/MD-12-2015-0557>
7. Boubakri, N., Cosset, J. C., & Guedhami, O. (2008). Privatisation in developing countries: Performance and ownership effects. *Development Policy Review*, 26(3), 275-308. <https://doi.org/10.1111/j.1467-7679.2008.00411.x>
8. Brown, D. J., Earle, J. S., & Telegdy, A. (2016). Where does privatization work? Understanding the heterogeneity in estimated firm performance effects. *Journal of Corporate Finance*, 41(C), 329-362. <https://doi.org/10.1016/j.jcorpfin.2016.10.001>
9. Carlin, T. M., & Pham, C. D. (2009). From Public To Private: Evidence From a Transitional Economy Setting. *Australian Accounting Review*, 19(3), 207-216. <https://doi.org/10.1111/j.1835-2561.2009.00058.x>
10. Chen, G., Firth, M., & Rui, O. (2006). Have China's enterprise reforms led to improved efficiency and profitability? *Emerging Markets Review*, 7(1), 82-109. <https://doi.org/10.1016/j.ememar.2005.05.003>
11. Cuervo, A., & Villalonga, B. (2000). Explaining the variance in the performance effects of privatization. *Academy of Management Review*, 25(3), 581-590. Retrieved from <https://www.jstor.org/stable/259311>
12. Dewenter, K. L., & Malatesta, P. H. (2001). State-owned and privately owned firms: An empirical analysis of profitability, leverage, and labor intensity. *American Economic Review*, 91(1), 320-334. Retrieved from <https://www.aeaweb.org/articles?id=10.1257/aer.91.1.320>
13. Estrin, S., & Pelletier, A. (2018). Privatization in developing countries: what are the lessons of recent experience? *The World Bank Research Observer*, 33(1), 65-102. Retrieved from <https://elibrary.worldbank.org/doi/abs/10.1093/wbro/lkx007>
14. Farinos, J. E., Garcia, C. J., & Ibanez, A. M. (2007). Operating and stock market performance of state-owned enterprise privatizations: the Spanish experience. *International Review of Financial Analysis*, 16(4), 367-389. <http://dx.doi.org/10.2139/ssrn.887734>
15. Gan, J. (2009). Privatization in China: Experiences and lessons. *China's Emerging Financial Markets* (pp. 581-592). Springer. Retrieved from https://link.springer.com/chapter/10.1007/978-0-387-93769-4_19
16. Harper, J. T. (2002). The performance of privatized firms in the Czech Republic. *Journal of Banking & Finance*, 26(4), 621-649. [https://doi.org/10.1016/S0378-4266\(01\)00157-1](https://doi.org/10.1016/S0378-4266(01)00157-1)
17. Huang, G., & Song, F. M. (2005). The financial and operating performance of China's newly listed H-firms. *Pacific-Basin Finance Journal*, 13(1), 53-80. <https://doi.org/10.1016/j.pacfin.2004.05.001>
18. Hung, D. N., Thien, N. D., & Liem, N. T. (2017). The Impact of Equitization on Firm Performance: The Case of Vietnam. *International Research Journal of Finance and Economics*, 12(164), 68-74. Retrieved from <http://www.internationalresearchjournaloffinanceandconomics.com>
19. Iwasaki, I., & Mizobata, S. (2018). Post-Privatization Ownership and Firm Performance: A Large Meta-Analysis of the Transition Literature. *Annals of Public and Cooperative Economics*, 89(2), 263-322. <https://doi.org/10.1111/apce.12180>
20. Jiang, G., Yue, H., & Zhao, L. (2009). A re-examination of China's share issue privatization. *Journal of Banking & Finance*, 33(12), 2322-2332. <https://doi.org/10.1016/j.jbankfin.2009.06.008>
21. Liao, L., Liu, B., & Wang, H. (2014). China's secondary privatization: Perspectives from the split-share structure reform. *Journal of Financial Economics*, 113(3), 500-518. <http://dx.doi.org/10.2139/ssrn.2037177>
22. Loc, T. D., & Tran, N. M. (2016). Impact of equitization on performance of enterprises in Vietnam. *Journal of Economic Development*, 23(3), 36-56. Retrieved from <https://www.semanticscholar.org/paper/Impact-of-Equitization-on-Performance-of-in-Vietnam-Loc-Tr%C3%A2n/b718756775308c-1843ce38cc06cb54538a208a99>

23. Loc, T. D., Lanjouw, G., & Lensink, R. (2006). The impact of privatization on firm performance in a transition economy: The case of Vietnam. *Economics of Transition*, 14(2), 349-389. <https://doi.org/10.1111/j.1468-0351.2006.00251.x>
24. Mager, F., & Jesswein, T. (2010). The fundamental performance of newly privatized firms: evidence from continental Europe. *Applied Economics Letters*, 17(2), 181-186. Retrieved from <https://doi.org/10.1080/13504850701719934>
25. McKenzie, M., & Keneley, M. (2011). Privatization and performance: the case of four Australian financial institutions. *Annals of Public and Cooperative Economics*, 82(3), 313-334. <https://doi.org/10.1111/j.1467-8292.2011.00441.x>
26. Megginson, W. L. (2017). Privatization, state capitalism, and state ownership of business in the 21st century. *Foundations and Trends® in Finance*, 11(1-2), 1-153. <http://dx.doi.org/10.1561/05000000053>
27. Megginson, W. L., Nash, R. C., & Van Randenborgh, M. (1994). The financial and operating performance of newly privatized firms: An international empirical analysis. *The Journal of Finance*, 49(2), 403-452. <https://doi.org/10.1111/j.1540-6261.1994.tb05147.x>
28. Ochieng, M. D., & Ahmed, A. H. (2014). The effects of privatization on the financial performance of Kenya Airways. *International Journal of Business and Commerce*, 3(5), 10-26. Retrieved from <https://ir-library.ku.ac.ke/bitstream/handle/123456789/20037/The%20Effect%20of%20Privatization.....pdf?sequence=1&isAllowed=y>
29. Oqdeh, L. N., & Abu Nassar, M. (2011). Effects of Privatization on Firms Financial and Operating Performance: Evidence from Jordan. *Dirasat: Administrative Sciences*, 161(717), 1-32. Retrieved from <https://journals.ju.edu.jo/DirasatAdm/article/view/2208>
30. Pham, C. D. (2017). The effects of privatization on the financial position and performance of firms in emerging markets: evidence from Vietnam. *International Journal of Business, Economics and Law*, 13(1), 38-46. Retrieved from <http://ijbel.com/wp-content/uploads/2017/09/ACC-224.pdf>
31. Pham, D. C., & Nguyen, T. X. H. (2019). The influence of privatization on financial performance of Vietnamese privatized state-owned enterprises. *Investment Management & Financial Innovations*, 16(3), 341. Retrieved from [http://dx.doi.org/10.21511/imfi.16\(3\).2019.30](http://dx.doi.org/10.21511/imfi.16(3).2019.30)
32. Porter, M. E. (1990). The competitive advantage of nations. *Competitive Intelligence Review*, 1(1), 14-14. Retrieved from <https://hbr.org/1990/03/the-competitive-advantage-of-nations>
33. Radygin, A. (2014). Privatisation in Russia: hard choice, first results, new targets. *First Results, New Targets (February 4, 2014)*. Retrieved from <ftp://ftp.repec.org/opt/ReDIF/RePEc/gai/ppaper/174Radygin.pdf>
34. Rakhman, F. (2018). Can partially privatized SOEs outperform fully private firms? Evidence from Indonesia. *Research in International Business and Finance*, 45, 285-292. <https://doi.org/10.1016/j.ribaf.2017.07.160>
35. Sakr, A. (2014). The impact of privatisation on the performance of Firms in Egypt. *Research Journal of Finance and Accounting*, 5(15), 73-81. Retrieved from <https://www.iiste.org/Journals/index.php/RJFA/article/view/14790/15410>
36. Sheshinski, E., & López-Calva, L. F. (2003). Privatization and its benefits: theory and evidence. *CESifo Economic Studies*, 49(3), 429-459. <https://doi.org/10.1093/cesifo/49.3.429>
37. Sprenger, C. (2014). Privatization and survival: Evidence from a Russian firm survey. *Economic Annals*, 59(200), 43-60. Retrieved from <http://www.ekof.bg.ac.rs/wp-content/uploads/2014/06/200-2.pdf>
38. Tran, N. M., Nonneman, W., & Jorissen, A. (2015). Privatization of Vietnamese firms and its effects on firm performance. *Asian economic and financial review*, 5(2), 202. Retrieved from <http://www.aess-web.com/journals/5002>
39. Tu, G., Lin, B., & Liu, F. (2013). Political connections and privatization: Evidence from China. *Journal of Accounting and Public Policy*, 32(2), 114-135. <https://doi.org/10.1016/j.jaccpubpol.2012.10.002>
40. Wei, Z., Varela, O., D'Souza, J., & Hassan, M. K. (2003). The financial and operating performance of China's newly privatized firms. *Financial Management*, 32(2), 107-126. Retrieved from <https://www.jstor.org/stable/3666339>

APPENDIX A

Table A1. Performance changes of privatized SOEs in agriculture, fishing and aquaculture and mining sectors (privatized SOEs with tax incentives)

Variable	Mean before (Median)/ Std before (Median)	Mean after (Median)/ Std after (Median)	Mean change (Median)/ Std change (Median)	t-Test for Difference in Means/ Std (Before- After)	Mann-Whitney test (z) for Difference in Medians of means/ Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/ Medians of Std (Before-After)
(P1) Profitability						
ROS	0.015 (0.011)	0.066 (0.044)	-0.051 (-0.033)	-1.020 (0.320)	-1.512 (0.131)	0.300
	0.067 (0.037)	0.069 (0.047)	-0.002 (-0.010)	-0.049 (0.961)	-0.529 (0.596)	0.430
ROA	0.039 (0.013)	0.065 (0.051)	-0.026 (-0.038)	-0.828 (0.417)	-0.832 (0.406)	0.390
	0.028 (0.026)	0.043 (0.042)	-0.015 (-0.016)	-1.322 (0.204)	-1.209 (0.226)	0.340
ROE	0.0633 (0.069)	0.1348 (0.104)	-0.072 (-0.035)	-1.022 (0.319)	-1.058 (0.289)	0.360
	0.091 (0.062)	0.105 (0.058)	-0.014 (0.004)	-0.293 (0.773)	0.302 (0.762)	0.540
(P2) Operating efficiency						
SALEFF	133.720 (134.162)	998.575 (243.205)	-864.855 (-109.043)**	-0.898 (0.379)	-2.117 (0.034)	0.220**
	47.880 (43.788)	369.369 (74.469)	-321.489 (-30.681)	-1.123 (0.290)	-1.436 (0.151)	0.310
NIEFF	12.760 (3.148)	24.632 (16.671)	-11.872 (-13.523)*	-0.898 (0.379)	-1.663 (0.096)	0.280*
	16.676 (8.255)	15.365 (8.714)	1.311 (-0.459)	0.123 (0.903)	0.454 (0.650)	0.560
TAS	0.979 (0.995)	1.5054 (0.736)	-0.526 (0.259)	-0.863 (0.406)	0.151 (0.879)	0.520
	0.268 (0.251)	0.648 (0.286)	-0.380 (-0.035)	-1.168 (0.269)	-0.832 (0.406)	0.390
P(3) Output						
SAL	209,053.3 (36,956.4)	195,393.2 (41,978.26)	13,660.100 (-5,021.860)	0.097 (0.924)	0.529 (0.597)	0.570
	77,368.11 (17,348.61)	109,810.8 (22,692.46)	-32,442.690 (-5,343.850)	-0.451 (0.658)	-0.529 (0.597)	0.430
P(4) Employment						
EMPL	1237.7 (470.125)	1,158.025 (156)	79.675 (314.125)	0.113 (0.911)	0.907 (0.364)	0.620
	129.064 (62.797)	64.358 (9.667)	64.706 (53.130)*	1.044 (0.309)	1.814 (0.069)	0.740*
P(5) Leverage						
LEV	0.542 (0.595)	0.549 (0.569)	-0.007 (0.026)	-0.060 (0.953)	-0.076 (0.939)	0.490
	0.148 (0.063)	0.097 (0.105)	0.051 (-0.042)	1.052 (0.314)	0.000 (1.000)	0.500

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The number of observations is 20.

Table A2. Performance changes of privatized SOEs in the manufacturing and construction sectors (privatized SOEs with tax incentives)

Variable	Mean before (Median)/Std before (Median)	Mean after (Median)/Std after (Median)	Mean change (Median)/Std change (Median)	t-Test for Difference in Means/Std (Before-After)	Mann-Whitney test (z) for Difference in Medians of means/ Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/ Medians of Std (Before-After)
(P1) Profitability						
ROS	0.007 (0.008)	0.042 (0.028)	-0.035*** (-0.020)***	-2.748 (0.007)	-5.462 (0.000)	0.262***
	0.045 (0.014)	0.034 (0.015)	0.011 (-0.001)	0.846 (0.399)	-0.618 (0.536)	0.473
ROA	0.005 (0.006)	0.039 (0.028)	-0.034*** (-0.022)***	-4.114 (0.0001)	-5.512 (0.000)	0.259***
	0.028 (0.010)	0.027 (0.017)	0.001 (-0.007)**	0.092 (0.926)	-2.000 (0.045)	0.413**
ROE	0.022 (0.039)	0.152 (0.145)	-0.130*** (-0.106)***	3.027 (0.003)	-4.986 (0.000)	0.282***
	0.246 (0.058)	0.125 (0.053)	0.121* (0.005)	1.808 (0.073)	-0.154 (0.877)	0.493
(P2) Operating efficiency						
SALEFF	381.308 (238.461)	621.538 (345.711)	-240.230** (-107.250)***	-2.485 (0.014)	-3.669 (0.0002)	0.340***
	165.709 (70.044)	303.217 (87.195)	-137.508** (-17.151)	-2.032 (0.044)	-1.539 (0.123)	0.433
NIEFF	12.732 (3.265)	42.127 (11.259)	-29.395 (-7.994)***	-1.623 (0.107)	-4.548 (0.000)	0.302***
	41.126 (13.901)	54.171 (11.298)	-13.045 (2.603)	-0.741 (0.459)	0.053 (0.957)	0.502
TAS	0.952 (0.865)	1.085 (0.998)	-0.133 (-0.133)*	-1.513 (0.132)	-1.737 (0.082)	0.424*
	0.283 (0.216)	0.356 (0.230)	-0.073 (-0.014)	-1.246 (0.215)	-0.595 (0.552)	0.474
P(3) Output						
SAL	200,784.5 (92,787.87)	90,549.94 (24,814.97)	110,234.560** (67,972.900)***	2.531 (0.013)	5.045 (0.000)	0.720***
	54,292.26 (26,037.39)	58,130.82 (20,198)	-3,838.560 (5,839.390)	-0.283 (0.777)	0.269 (0.787)	0.512
P(4) Employment						
EMPL	650.736 (336.625)	464.772 (307.625)	185.964* (29.000)	1.739 (0.084)	1.289 (0.197)	0.556
	144.825 (76.153)	111.391 (32.783)	33.434 (43.370)**	1.333 (0.184)	2.113 (0.035)	0.592**
P(5) Leverage						
LEV	0.813 (0.839)	0.6957 (0.756)	0.117*** (0.083)***	3.252 (0.001)	3.258 (0.001)	0.642***
	0.101 (0.047)	0.171 (0.092)	-0.070 (-0.045)***	-1.250 (0.214)	-4.373 (0.000)	0.309***

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The number of observations is 176.

Table A3. Performance changes of privatized SOEs in the services sector (privatized SOEs with tax incentives)

Variable	Mean before (Median)/Std before (Median)	Mean after (Median)/Std after (Median)	Mean change (Median)/Std change (Median)	t-test for Difference in Means/Std (Before-After)	Mann-Whitney test (z) for Difference in Medians of means/ Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/ Medians of Std (Before-After)
(P1) Profitability						
ROS	0.007 (0.005)	0.013 (0.014)	-0.006 (-0.009)**	-0.210 (0.834)	-2.454 (0.014)	0.348**
	0.095 (0.004)	0.178 (0.019)	-0.083 (-0.015)***	-0.539 (0.592)	-3.730 (0.0002)	0.269***
ROA	0.022 (0.011)	0.043 (0.027)	-0.021* (-0.016)***	-1.840 (0.069)	-2.570 (0.010)	0.341***
	0.036 (0.009)	0.036 (0.018)	0.0001 (-0.009)***	0.011 (0.991)	-3.647 (0.0003)	0.274***
ROE	-0.014 (0.031)	0.083 (0.108)	-0.097 (-0.077)	-1.349 (0.181)	-2.520 (0.012)	0.344
	0.178 (0.034)	0.229 (0.062)	-0.051 (-0.028)**	-0.529 (0.598)	-1.969 (0.049)	0.378**
(P2) Operating efficiency						
SALEFF	1,499.898 (841.639)	8,900.658 (768.590)	-7,400.760 (73.049)	-1.057 (0.296)	-0.184 (0.854)	0.489
	413.417 (214.536)	15,155.18 (249.545)	-14,741.763 (-35.009)	-1.018 (0.314)	-0.559 (0.576)	0.465
NIEFF	5.039 (7.457)	86.316 (16.938)	-81.277** (9.481)**	-2.007 (0.050)	-2.237 (0.025)	0.362**
	88.742 (23.978)	62.374 (41.693)	26.368 (-17.715)	0.748 (0.457)	-0.793 (0.428)	0.451
TAS	2.337 (1.6039)	2.144 (1.608)	0.193 (-0.004)	0.423 (0.673)	0.392 (0.695)	0.524
	0.539 (0.334)	0.824 (0.349)	-0.285 (-0.015)	-1.288 (0.203)	-0.576 (0.565)	0.464
P(3) Output						
RSAL	429,146.3 (109,617.5)	717,867.4 (33,643.93)	-288,721.100 (75,973.570)***	0.536 (0.594)	3.405 (0.0007)	0.711***
	106,714.4 (25,208.96)	1,159,952 (24,578.35)	-1,053,237.6 (630.610)	-1.088 (0.282)	-0.292 (0.770)	0.482
(P4) Employment						
EMPL	258.591 (165.5)	223.767 (106.625)	34.824 (58.875)*	0.571 (0.569)	1.686 (0.092)	0.604*
	46.557 (31.960)	63.379 (15.685)	-16.822 (16.275)	-0.651 (0.517)	1.469 (0.142)	0.591
(P5) Leverage						
LEV	0.719 (0.752)	0.658 (0.701)	0.061 (0.051)	1.008 (0.316)	0.693 (0.488)	0.543
	0.102 (0.052)	0.111 (0.084)	-0.009 (-0.032)*	-0.316 (0.753)	-1.911 (0.056)	0.382*

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The number of observations is 88.

Table A4. Performance changes of unlisted SOEs after privatization (privatized SOEs with tax incentives)

Variable	Mean before (Median)/ Std before (Median)	Mean after (Median)/Std after (Median)	Mean change (Median)/Std change (Median)	t-test for Difference in Means/Std (Before-After)	Mann-Whitney test (z) for Difference in Medians of means/ Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/ Medians of Std (Before-After)
(P1) Profitability						
ROS	-0.003 (0.004)	0.018 (0.020)	-0.021 (-0.016)***	-1.454 (0.147)	-4.753 (0.000)	0.301***
	0.074 (0.012)	0.101 (0.015)	-0.027 (-0.003)	-0.374 (0.709)	-1.039 (0.299)	0.457
ROA	0.008 (0.003)	0.031 (0.018)	-0.023** (-0.015)***	-3.309 (0.0011)	-4.668 (0.000)	0.305***
	0.034 (0.009)	0.029 (0.017)	0.005 (-0.008)**	0.321 (0.748)	-2.348 (0.019)	0.402**
ROE	-0.006 (0.021)	0.086 (0.089)	-0.092** (-0.068)***	-2.052 (0.042)	-4.143 (0.000)	0.327***
	0.258 (0.044)	0.177 (0.048)	0.081 (-0.004)	1.127 (0.261)	-0.974 (0.330)	0.459
(P2) Operating efficiency						
SALEFF	495.042 (260.083)	769.199 (345.711)	-274.157* (-85.628)**	-1.911 (0.058)	-2.543 (0.011)	0.394**
	189.712 (74.104)	374.674 (91.281)	-184.962** (-17.177)	-2.069 (0.041)	-1.034 (0.301)	0.457
NIEFF	3.120 (2.574)	13.993 (8.545)	-10.873* (-5.971)***	-1.9138 (0.057)	-4.034 (0.0001)	0.331***
	59.409 (22.075)	59.395 (19.215)	0.014 (2.860)	0.0008 (0.999)	-0.114 (0.909)	0.495
TAS	1.193 (0.967)	1.347 (0.964)	-0.154 (0.003)	-0.9480 (0.344)	-0.753 (0.451)	0.469
	0.345 (0.238)	0.492 (0.258)	-0.147* (-0.020)	-1.749 (0.083)	-1.096 (0.273)	0.454
P(3) Output						
SAL	136,358.6 (65,532.75)	51,472.59 (17,808.03)	84,886.010** (47,724.720)***	2.5223 (0.013)	6.057 (0.000)	0.753***
	33,999.59 (19,259.25)	41,744.73 (13,444.39)	-7,745.140 (5,814.860)	-0.792 (0.429)	0.319 (0.749)	0.513
P(4) Employment						
EMPL	404.859 (233.5)	243.005 (144.25)	161.854** (89.250)**	2.097 (0.038)	2.300 (0.021)	0.596**
	87.467 (40.285)	52.415 (16.340)	35.052** (23.945)***	2.216 (0.028)	3.212 (0.001)	0.634***
P(5) Leverage						
LEV	0.7691 (0.804)	0.698 (0.764)	0.071* (0.04)*	1.936 (0.054)	1.795 (0.073)	0.575*
	0.093 (0.052)	0.116 (0.094)	-0.023 (-0.042)***	-1.331 (0.185)	-3.587 (0.0003)	0.350***

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The number of observations is 192.

Table A5. Performance changes of listed SOEs after privatization (privatized SOEs with tax incentives)

Variable	Mean before (Median)/Std before (Median)	Mean after (Median)/Std after (Median)	Mean change (Median)/Std change (Median)	t-Test for Difference in Means/Std (Before-After)	Mann-Whitney test (z) for Difference in Medians of means/Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/Medians of Std (Before-After)
(P1) Profitability						
ROS	0.031 (0.012)	0.068 (0.058)	-0.037* (-0.046)***	-1.806 (0.075)	-4.186 (0.000)	0.247***
	0.036 (0.006)	0.040 (0.017)	-0.004 (-0.011)***	-0.205 (0.838)	-3.147 (0.002)	0.310***
ROA	0.023 (0.012)	0.064 (0.061)	-0.041*** (-0.049)***	-3.074 (0.003)	-4.381 (0.000)	0.235***
	0.024 (0.009)	0.034 (0.021)	-0.010 (-0.012)***	-1.171 (0.245)	-3.053 (0.002)	0.315***
ROE	0.055 (0.087)	0.219 (0.187)	-0.164*** (-0.100)***	-3.199 (0.002)	-4.420 (0.000)	0.233***
	0.121 (0.059)	0.112 (0.060)	0.009 (-0.001)	0.199 (0.842)	-0.812 (0.417)	0.451
(P2) Operating efficiency						
SALEFF	1,160.082 (334.938)	8,314.497 (639.274)	-7,154.415 (-304.336)**	-1.067 (0.291)	-1.960 (0.050)	0.381**
	326.938 (100.876)	14,374.7 (131.099)	-14,047.762 (-30.223)*	-1.014 (0.315)	-1.702 (0.089)	0.397*
NIEFF	25.438 (8.339)	139.307 (28.095)	-113.869** (-19.756)***	-2.340 (0.023)	-3.655 (0.0003)	0.279***
	43.199 (7.582)	42.679 (7.22)	0.520 (0.362)	0.019 (0.984)	-0.164 (0.869)	0.490
TAS	1.779 (1.097)	1.644 (1.215)	0.135 (-0.118)	0.343 (0.732)	-0.593 (0.553)	0.464
	0.396 (0.259)	0.582 (0.238)	-0.186 (0.021)	-1.004 (0.319)	-0.180 (0.857)	0.489
(P3) Output						
SAL	555,469.1 (329,999)	794,937.5 (103,212.7)	-239,468.400 (226,786.300)***	-0.466 (0.643)	3.061 (0.002)	0.685***
	151,801.5 (86,171.93)	1,157,479 (85,260.93)	-1,005,677.500 (911)	-1.088 (0.282)	-0.500 (0.617)	0.470
(P4) Employment						
EMPL	916.375 (541.75)	847.771 (527.75)	68.604 (14)	0.344 (0.731)	0.195 (0.845)	0.512
	167.107 (102.745)	178.323 (89.033)	-11.216 (13.712)	-0.261 (0.794)	0.492 (0.623)	0.530
(P5) Leverage						
LEV	0.756 (0.783)	0.621 (0.659)	0.135** (0.124)**	2.388 (0.019)	2.507 (0.012)	0.652**
	0.127 (0.047)	0.212 (0.088)	-0.085 (-0.041)**	-0.798 (0.428)	-2.522 (0.012)	0.347**

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The number of observations is 92.

Table A6. Performance changes of small and medium-sized SOEs after privatization (privatized SOEs with tax incentives)

Variable	Mean before (Median)/Std before (Median)	Mean after (Median)/Std after (Median)	Mean change (Median)/Std change (Median)	t-Test for Difference in Means/Std (Before-After)	Mann-Whitney test (z) for Difference in Medians of means/ Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/ Medians of Std (Before-After)
(P1) Profitability						
ROS	-0.0006 (0.002)	-0.005 (0.008)	0.004 (-0.006)*	0.133 (0.894)	-1.944 (0.052)	0.365*
	0.114 (0.026)	0.223 (0.022)	-0.109 (0.004)	-0.580 (0.565)	0.276 (0.782)	0.519
ROA	0.009 (0.003)	0.017 (0.010)	-0.008 (-0.007)	-0.571 (0.570)	-1.415 (0.157)	0.402
	0.065 (0.017)	0.032 (0.013)	0.033 (0.004)	1.003 (0.321)	-0.300 (0.764)	0.479
ROE	-0.067 (0.016)	0.029 (0.032)	-0.096 (-0.016)	-1.050 (0.299)	-0.840 (0.401)	0.442
	0.384 (0.097)	0.151 (0.037)	0.233 (0.060)	1.596 (0.118)	0.781 (0.435)	0.554
(P2) Operating efficiency						
SALEFF	657.946 (445.883)	1,014.255 (514.269)	-356.309 (-68.386)	-1.133 (0.263)	-0.910 (0.363)	0.437
	259.274 (103.407)	476.222 (153.367)	-216.948 (-49.960)	-1.493 (0.142)	-1.357 (0.175)	0.406
NIEFF	0.948 (0.688)	11.114 (5.127)	-10.166 (-4.439)	-0.714 (0.479)	-1.380 (0.167)	0.404
	95.574 (44.669)	112.075 (63.537)	-16.501 (-18.868)	-0.479 (0.633)	-0.922 (0.356)	0.436
TAS	1.304 (1.042)	1.553 (0.983)	-0.249 (0.059)	-0.693 (0.491)	-0.393 (0.694)	0.473
	0.381 (0.278)	0.596 (0.288)	-0.215 (-0.010)	-1.427 (0.160)	-0.652 (0.514)	0.455
P(3) Output						
RSAL	61,043.44 (34,364.09)	35,665.37 (9,051.145)	25,378.070 (25,312.945)***	1.230 (0.223)	2.848 (0.004)	0.698***
	23,638.04 (6,677.411)	27,890.45 (8,648.385)	-4,252.410 (-1,970.974)	-0.363 (0.718)	-0.476 (0.634)	0.467
P(4) Employment						
EMPL	108.193 (87)	60.985 (58)	47.208*** (29)***	3.172 (0.003)	3.172 (0.001)	0.720***
	35.149 (13.735)	13.791 (7.047)	21.358 (6.688)**	1.554 (0.127)	2.478 (0.013)	0.672**
P(5) Leverage						
LEV	0.758 (0.707)	0.664 (0.657)	0.094 (0.050)	1.257 (0.213)	0.828 (0.407)	0.558
	0.143 (0.064)	0.123 (0.089)	0.020 (-0.025)	0.493 (0.624)	-0.746 (0.456)	0.448

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The number of observations is 70.

Table A7. Performance changes of large SOEs after privatization (privatized SOEs with tax incentives)

Variable	Mean before (Median)/ Std before (Median)	Mean after (Median)/Std after (Median)	Mean change (Median)/Std change (Median)	t-Test for Difference in Means/Std (Before-After)	Mann-Whitney test (z) for Difference in Medians of means/ Medians of Std (Before-After)	The proportion of firms that changed in Medians of means/ Medians of Std (Before-After)
(P1) Profitability						
ROS	0.010 (0.008)	0.047 (0.032)	-0.037*** (-0.024)***	-3.211 (0.001)	-6.318 (0.000)	0.250***
	0.045 (0.008)	0.035 (0.015)	0.010 (-0.007)***	0.517 (0.606)	-3.278 (0.001)	0.370***
ROA	0.013 (0.008)	0.050 (0.037)	-0.036*** (-0.029)***	-5.007 (0.000)	-6.501 (0.000)	0.243***
	0.019 (0.009)	0.031 (0.020)	-0.012** (-0.011)***	-2.526 (0.012)	-4.033 (0.0001)	0.340***
ROE	0.039 (0.051)	0.161 (0.164)	-0.122*** (-0.113)***	-3.502 (0.0006)	-6.470 (0.000)	0.244***
	0.158 (0.048)	0.157 (0.058)	0.001 (-0.010)*	0.017 (0.986)	-1.915 (0.055)	0.424*
(P2) Operating efficiency						
SALEFF	727.661 (255.048)	3,932.814 (388.541)	-3,205.153 (-133.493)***	-1.109 (0.269)	-3.304 (0.001)	0.369***
	225.953 (78.559)	6,360.158 (95.747)	-6,134.205 (-17.188)	-1.030 (0.305)	-1.174 (0.241)	0.454
NIEFF	13.425 (4.571)	68.808 (16.179)	-55.383** (-11.608)***	-2.546 (0.012)	-5.366 (0.000)	0.288***
	40.611 (11.089)	34.977 (8.480)	5.634 (2.609)	0.336 (0.737)	0.052 (0.958)	0.502
TAS	1.409 (0.984)	1.407 (1.071)	0.002 (-0.088)	0.009 (0.993)	-1.068 (0.286)	.458
	0.355 (0.231)	0.497 (0.247)	-0.142 (-0.016)	-1.446 (0.150)	-0.692 (0.488)	0.473
P(3) Output						
RSAL	341,172.7 (15,3817.8)	376,263.6 (36228.5)	-35,090.900 (117,589.300)***	-0.156 (0.876)	5.678 (0.000)	0.725***
	88,032.71 (33,990.92)	525,937.8 (29,049.45)	-437,905.090 (4941.470)	-1.099 (0.274)	0.085 (0.932)	0.503
P(4) Employment						
EMPL	721.804 (383.25)	562.537 (323.5)	159.267 (59.750)	1.438 (0.152)	1.624 (0.104)	0.564
	138.818 (71.742)	119.177 (33.645)	19.641 (38.097)**	0.855 (0.393)	2.228 (0.026)	0.588**
P(5) Leverage						
LEV	0.767 (0.803)	0.677 (0.726)	0.090*** (0.077)***	2.755 (0.006)	2.929 (0.003)	0.616***
	0.092 (0.047)	0.155 (0.092)	-0.063 (-0.045)***	-1.376 (0.171)	-4.697 (0.000)	0.314***

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The number of observations is 214.