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Equitisation and stock-market development

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Chapter 6

The Impact of Equitisation on Firm Performance in Vietnam: An Empirical Study

6.1. Introduction

During the last decades, privatisation has become an important part of the economic reforms in transition economies. Most governments expect that through launching privatisation programmes firm performance will improve. Like in other transitional countries, the Vietnamese government launched a privatisation process (named “Equitisation Programme”) in 1992 as part of the State-Owned Enterprise Reform Programme. This chapter aims to examine the impact of this programme on firm performance by using data of 121 equitised firms and 84 SOEs. Following the methodology of Megginson, Nash and Randenborgh (1994), the chapter first compares the pre to post-equitisation financial and operating performance of the full sample of firms. Then, the sample is partitioned into several sub-groups based on factors that the literature has documented as being potentially important in determining firm performance following privatisation, and statistical tests are conducted for detecting significant changes in performance between sub-samples. In addition, to measure the sources of performance changes, a cross-sectional regression analysis is applied. Finally, to overcome the shortcoming of the pre-post comparison method that it is unable to isolate the impact of privatisation on firm performance from that of other determinants such as macroeconomic factors, the so-called difference-in-differences (DID) method is employed.

The rest of this chapter proceeds as follows. Section 6.2 presents the testable predictions and methodology that are used to test for the impact of equitisation on firm performance. The empirical results from the pre-post comparison method are summarised and discussed in Section 6.3 while Section 6.4 reports the outcomes of

the regression analyses. The DID method and empirical results from this method are given in Section 6.5. Finally, Section 6.6 concludes the Chapter.

6.2. Hypotheses and methodology

Privatisation is usually seen as a means to improve the performance of the firms in question. To examine the impact of privatisation on financial and operating performance of firms, many studies compare pre- and post-privatisation performance measures (Megginson *et al.*, 1994, Boubakri and Cosset, 1998, D'Souza and Megginson, 2001, Harper, 2002). Because the first study published using this methodology was Megginson, Nash and Randenborgh (1994), the methodology is usually referred to as the MNR methodology (Megginson and Netter, 2001). In this chapter, the methodology is applied to measure the effects of equitisation on firm performance in Vietnam. Some of the measures used in the MNR methodology, such as capital investment and dividends, cannot be employed in the study due to a lack of the necessary data. Moreover, some of the measures have to be adjusted to the Vietnamese situation. Specifically, income before tax is used to calculate profitability of firms instead of net income as in the MNR methodology. Similarly, net income efficiency is replaced by income-before-tax efficiency. An explanation for this adjustment is that in Vietnam the equitised firms have some income-tax advantages for the first years after equitisation, so to avoid a bias in measuring the impact of equitisation *per se* on profitability, income before tax has to be used instead of net income.

To measure the effects of equitisation on firm performance, performance measures are calculated for every firm for the years before and after equitisation. Then, the mean of each measure is computed for each firm over the pre-equitisation (years -3 to -1) and post-equitisation (years +1 to +3) period. However, it is important to note here that firms that have data for only one year before and after equitisation are also included in the sample. The aim of the inclusion is to enlarge the sample⁹. Because the year of equitisation includes both public and private ownership phases for many firms, it is eliminated from our analyses.

It is expected that if firms move from public to private ownership, their profitability increases. First, privatisation leads managers to focus on profit goals because under private ownership, management is directly responsible to shareholders (Yarrow, 1986). Second, to the extent that privatisation transfers both control rights and cash flow rights from politicians to managers, profitability increases through efficiency

⁹ We also conducted some analyses with a two-year and one-year data screen to find out the possible impact of the number of years included in the calculations. However, the results were very similar to those presented in this chapter.

gains in the form of redress of the excess labour spending that politicians needed for electoral reasons (Boycko *et al.*, 1996). Similarly, after privatisation firms should employ their human, financial and technological resources more efficiently because of a greater stress on profit goals and a reduction of government subsidies (Kikeri *et al.*, 1992 and Boycko *et al.*, 1996). Moreover, it is also expected that output (sales revenues) will increase following privatisation, because of better incentives, more flexible financing opportunities and greater scope for entrepreneurial initiative (Megginson *et al.*, 1994). Regarding leverage, the shift from public to private ownership can be expected to lead to a decrease in the share of debt in the capital structure since with the end of government debt guarantees the firm's cost of borrowing will increase and the firm has new access to public equity markets (Megginson *et al.* 1994). In addition, if bankruptcy costs are significant, once government guarantees are removed the newly privatised firm should reduce its debt (Boubakri and Cosset, 2002). Furthermore, we expect that the level of employment would decline once the SOE, which is usually overstaffed, turns private and no longer receives government subsidies. Finally, once the productivity of newly-privatised firms increase as a result of privatisation, employee income should improve. Table 6.1 presents definitions and expected changes of the performance measures investigated in this chapter.

Given a general improvement in performance as a result of privatisation, the literature documents that differences would arise due to differences in size, sector, ownership structure, corporate governance and capital market discipline (Comstock *et al.*, 2003; Harper, 2002; D'Souza *et al.*, 2001; Pistor and Turkewitz, 1996). Therefore, in the next step the data are divided into five sub-samples.

First, the firms are partitioned into two groups, larger firms and smaller firms, based on their pre-equitisation real sales average. Firms with a pre-equitisation real sales average above the median of the sample are referred to as larger firms; otherwise they belong to the second group of smaller firms. The literature is not unambiguous about the role of firm size in performance improvement after privatisation. On the one hand, Comstock *et al.* (2003) suppose that larger firms will enjoy greater improvements in their performance due to being better prepared for the post-privatisation environment, especially in terms of facing competition¹⁰. On the other hand, Harper (2002) argues that smaller firms will show greater improvement in performance after equitisation than larger firms because it would be easier for them to restructure and adjust their business. In addition, it could be relevant in the case of Vietnam that the residual state share in small equitised firms is usually lower than for large firms. As will be discussed later in this section, the

¹⁰ The study, however, assumes that privatisation is equivalent to the introduction of competition, which conceptually is incorrect. See, *e.g.*, Shirley and Walsh (2000) for a discussion in which competition and firm ownership are clearly distinguished conceptually.

literature suggests that the percentage of state ownership in newly-privatised firms has a negative effect on firm performance after privatisation.

Table 6.1: Performance measures: definitions and expected changes

Performance measures	Definition	Expected change
1. Profitability		
Income before tax on assets (IBTA)	Income before tax/total assets	Increase
Income before tax on sales (IBTS)	Income before tax/sales	Increase
Income before tax on equity (IBTE)	Income before tax/equity	Increase
2. Operating Efficiency		
Sales efficiency	Real sales/number of employees	Increase
Income efficiency	Income before tax/number of employees	Increase
3. Output (real sales)	Nominal sales/price index	Increase
4. Leverage	Total debt/total assets	Decrease
5. Employment	Number of employees	Decrease
6. Employee income	Annual income per employee	Increase

Next, a split is made on the basis of the sectors in which the firms operate: either trade and services or manufacturing. The underlying idea is that firms in the trade and services sector have an easier job in improving their performance since in this sector there is less need for investment in fixed assets that may be a necessary component of the adjustment process (Harper, 2002).

The literature further documents that ownership structure plays an important role in improving firm performance following privatisation. To measure such effects, the sample firms are divided into two subgroups on the basis of the median of the full sample (30 percent residual state-ownership). The reason to split the sample in this way is to generate subgroups with the same number of observations. It is expected that the former subgroup will show greater performance improvements than the latter one. The reason underlying this expectation is that the state as a shareholder has multiple interests - economic, social and political - that can be antagonistic to the interests of private shareholders in the direction of performance improvement (see, *e.g.*, Pistor and Turkewitz, 1996).

Additionally, to examine the impact of corporate governance on firm performance our sample is classified into firms that have a chairperson of the board of directors representing the state (FCBDRS), and firms that have a chairperson of the board of directors representing private investors (FCBDRP). In Vietnam, the board of directors has the highest authority to make decisions relevant to the company, except some issues that have to be approved by shareholders at the shareholders meeting. For instance, the board of directors exerts full power in the appointment or dismissal of the general manager and senior managers. It is expected that the improvements in performance measures are greater for firms in the latter group in that board chairpersons representing the private sector will give priority to improving firm performance and do not have to compromise with the other interests that state representatives have to take into account.

Moreover, the data are split into listed and non-listed firms. Listed firms are the equitised firms that have shares that are traded in the Ho Chi Minh City Stock Exchange. The corporate-governance literature suggests that stock-market listing provides important possibilities to monitor the management of firms. The fear of replacement and the linkage of compensation to performance stimulate a firm's management to maximise the firm's profit. Moreover, the listed firms could get other benefits from the listing of its shares on the stock market. First, through the stock market the firm can mobilize more capital at low cost. Second, since the firm's share price is publicly announced in many media, there are free channels for advertising the firm's image. Taking into account these factors, it is expected that listed firms have greater performance improvements than non-listed ones following equitisation.

Furthermore, the sample is divided into firms located in HCMC and other firms. HCMC is Vietnam's biggest city, and it is also the country's main economic centre. With the advantages of location, it is expected that firms in HCMC have larger gains in performance than firms in other regions.

As mentioned in Chapter 2, the equitisation programme in Vietnam consists of two stages, namely the pilot and expansion stages. Although the expansion stage officially started in 1996, the equitisation process only accelerated since the issuance of Decree No. 44 in mid-1998. Therefore, the sample is also partitioned into firms equitised before 1999 (January 1st, 1999) and other firms. Firms in the first group had to face some disadvantages such as lack of experience, the state's imperfect regulations and the short time for preparing equitisation compared to firms in the second group. Thus, the first group is expected to have lower performance gains than the second one.

6.3. Effect of equitisation on firm performance: Results from the pre-post comparison method

6.3.1. Results for the full sample

This section presents the empirical results for the full sample. The results are summarised in Table 6.2. It is important to note that before testing for significant changes in performance, the Jarque-Bera test was employed to examine whether the performance measures of the surveyed firms are normally distributed. The results (not reported in this paper, but to be obtained on request) are that the null hypothesis that the main variables in the sample are normally distributed is rejected for most measures. Consequently, the nonparametric two-tailed Wilcoxon signed-rank test is used to test for significant changes in the median of performance measures following equitisation¹¹. The Wilcoxon signed-rank method tests the null hypothesis that the median difference in measure values between the pre and post-equitisation periods is zero. This test takes into account information about the magnitude of differences within pairs and gives more weight to pairs that show large differences than to pairs that show small differences. The test statistic is based on the ranks of the absolute values of the differences between the two measures¹². Moreover, this study employs a proportion (binominal) test to determine whether the proportion (P) of firms with the anticipated changes is greater than what would be expected by chance, typically testing whether $P = 0.5$.

Profitability

Profitability is the most important indicator to measure the performance of firms. As expected, the results of the study show that all profitability ratios, to wit income before tax on assets (IBTA), income before tax on sales (IBTS), and income before tax on equity (IBTE), increase significantly after equitisation. Specifically, the mean (median) IBTA significantly increases (at the one percent level), from 9.35 (7.59) percent in the pre-equitisation period to 12.43 (10.82) percent in the post-equitisation period. Furthermore, Table 6.2 shows that a statistically significant 69.0 percent of the full sample has positive changes in IBTA. Similarly, the mean (median) of IBTS and IBTE increases from 6.10 (3.84) percent to 8.43 (6.04) percent, and from 22.92 (17.37) to 27.51 (22.94) percent respectively. These increases are significant at the one percent level. The results strongly confirm that

¹¹ Statistically, the nonparametric Wilcoxon test is more powerful in detecting the existence of significant differences than the parametric t-test when the sample is not normally distributed.

¹² For a detailed description of the Wilcoxon signed-rank test, see Berenson *et al.* (1988).

equitisation in Vietnam has a positive effect on the profitability of the firms in question.

Efficiency

To measure efficiency this study uses the inflation-adjusted sales per employee and income before tax per employee. In addition, they are normalised to equal 1.00 in year 0 (the year of equitisation), so the figures for other years are expressed as a fraction of values of the efficiency measures in the year of equitisation. The results of the study reveal that both efficiency measures show a significant increase (at the one percent level) after equitisation. For instance, sales efficiency rises from an average (median) 1.02 (1.00) in the pre-equitisation period to 1.26 (1.14) in the post-equitisation period. Similarly, income efficiency increases from on average (median) 1.10 (1.00) during the pre-equitisation period to 3.21 (1.70) after equitisation. Furthermore, the proportion tests show that sales efficiency and income efficiency increase in 74.0 and 91.5 percent of the number of firms respectively, both significant at the one percent level. These results suggest that the equitised firms use their resources with much greater efficiency after equitisation.

Output

Output is measured by inflation-adjusted sales (real sales). Similar to the efficiency measures, real sales are also normalised to 1.00 in year 0. Using the Wilcoxon test it is found that real sales increase significantly (at the one percent level) following equitisation. Specifically, the mean (median) real sale increases from 1.00 (1.00) during the pre-equitisation period to 1.41 (1.19) after equitisation. The proportion test also shows a significant increase (at the one percent level) in real sales level after equitisation. In fact, 81.0 percent of the firms in the sample improve their real sales level in the years following equitisation. This result confirms that equitisation in Vietnam has a positive effect on the output of firms.

Leverage

To measure the effect of equitisation on the leverage of firms, this study compares the pre-equitisation ratio of total debt to total assets to the post-equitisation ratio. Many scholars believe that leverage is reduced following privatisation due to a combination of greater retained earnings and new share offerings. In the case of Vietnam, a decline in leverage is also found, but it is insignificant. In fact, the mean (median) leverage decreases from 52.99 percent (56.22 percent) over the pre-equitisation period to 50.06 percent (54.43 percent) in the years following

equitisation. The results further show that 52 percent of the sample firms reduce their debt ratio after equitisation. However, the proportion test indicates that the decline in leverage following equitisation is insignificant. Clearly, the effect of equitisation on leverage of firms in Vietnam is not significant. The debt ratio of equitised firms is still high following equitisation, 50 percent on average.

Employment

The literature documents that the effect of privatisation on employment is ambiguous. Some researchers (Megginson *et al.*, 1994 and Boubakri and Cosset, 1998) report an increase in employment after privatisation while other authors (La Porta and López-De-Silanes, 1999, and Harper, 2002) found a significant decline in the number of employees after privatisation, which is in line with the theoretical model of Boycko *et al.* (1996) referred to earlier in this thesis. The results obtained from this study are consistent with the findings of Megginson *et al.* (1994) and Boubakri and Cosset (1998) in that employment does not decrease significantly over the post-privatisation period. Specifically, mean employment increases by 30 employees after equitisation, from 352 to 382 employees, although the Wilcoxon test shows that this increase is insignificant. Contrary to this test, the proportion test reveals that the increase in employment is significant at the one percent level, with 63.9 percent of the sample firms having an increased employment level following equitisation.

Employee income

This study measures the change in employee income by calculating the change in inflation-adjusted annual income per employee. The results of the study reveal that the mean (median) inflation-adjusted annual income per employee rises from 12.2 million VND (11.3 million) in the pre-equitisation period to 17.3 million VND (14.9 million) in the post-equitisation period, and 88.4 percent of the sample firms report to pay higher salaries to their employees. Both the Wilcoxon and proportion tests show that the increase in inflation-adjusted annual income per employee is significant at the one percent level.

In short, the results suggest that equitisation has positive effects on firm performance in Vietnam. It is found that profitability, efficiency, and output of equitised firms increase significantly after equitisation. In addition, the study documents a decline in leverage (measured by total debt to total assets) of firms in the post-equitisation period, although it is statistically insignificant. Remarkably, the results show no evidence of a significant decline in employment in the years following equitisation. Finally, the findings confirm that equitisation results in

Table 6.2: Summary of results from tests of expected results for the full sample of all equitised firms

Measures	N	Mean (median) before	Mean (median) after	Mean (median) change	Z-Statistic for difference in medians (after – before)	Proportion of firms that performed as expected	Z-Statistic for significant of proportion change
Profitability							
IBTA	100	0.0935 (0.0759)	0.1243 (0.1082)	0.0308 (0.0323)	2.69 ^a	0.690	3.80 ^a
IBTS	121	0.0610 (0.0384)	0.0843 (0.0604)	0.0233 (0.0220)	3.21 ^a	0.793	6.44 ^a
IBTE	121	0.2292 (0.1737)	0.2751 (0.2294)	0.0459 (0.0557)	3.36 ^a	0.678	3.91 ^a
Operating efficiency							
Sales efficiency (million VND)	119	1.0204 (1.0000)	1.2631 (1.1410)	0.2427 (0.1410)	4.82 ^a	0.740	5.23 ^a
Income efficiency (million VND)	118	1.1011 (1.0000)	3.2056 (1.6993)	2.1045 (0.6993)	9.23 ^a	0.915	9.03 ^a
Real sales (million VND)	121	1.0048 (0.9996)	1.4102 (1.1907)	0.4054 (0.1911)	7.67 ^a	0.810	6.81 ^a
Leverage							
Total debts/total assets	100	0.5299 (0.5622)	0.5006 (0.5443)	-0.0293 (-0.0179)	0.90	0.520	0.40
Employment							
(Number of employees)	119	352 (159)	382 (155)	30 (-4)	0.52	0.336	-3.58 ^a
Annual income per employee (million VND)	95	12.2 (11.3)	17.3 (14.9)	5.1 (3.6)	3.41 ^a	0.884	7.02 ^a

^a Significant at the 1% level

significant increase in employee income after equitisation. Especially, the results go against the hypothesis that performance improvements of privatised firms are derived from the excess labour spending that is characteristic of SOEs according to the model of Boycko *et al.* (1996). A possible explanation for this result may be that employees, holding substantial portions of shares of equitised firms in the case of Vietnam, are able to prevent reductions in employment of the firms in question and even are able to achieve rises in their income. The remarkable improvements in profitability and efficiency may be explained by the incentive effect of the income rises that stimulates the employees to work more efficiently.

6.3.2. Sub-sample results

To determine significant changes in performance measures between sub-samples, the Mann-Whitney U test is employed. The Mann-Whitney U test is used to examine whether or not two independently drawn samples came from the same population. This test is designed to test the null hypothesis that two populations are identical against the alternative hypothesis that they differ¹³.

Larger firms versus smaller firms

Table 6.3 compares the performance changes of larger firms with the performance changes of smaller firms. As discussed above, the literature comes up with conflicting hypotheses regarding the role of firm size in post-privatisation performance improvement. The outcome of our comparison is that for most criteria smaller firms show greater performance improvements after equitisation than larger ones. Specifically, smaller firms report greater rises in IBTA, IBTS, IBTE, income efficiency, and employee income. For instance, the mean (median) increase in IBTS for the smaller firms is 2.30 percentage points (3.14 percentage points) higher than the larger firms, 3.47 percent (4.11 percent) compared to 1.17 percent (0.97 percent). Similarly, the mean (median) change in IBTE for smaller firms is 10.46 percent (6.86 percent) as compared to -1.37 percent (2.34 percent) for the larger firms. The Mann-Whitney test shows that the difference in performance changes between the two sub-samples is significant at the one percent level for IBTS, IBTE, and at the five percent level for income efficiency. No significant difference is found for IBTA and employee income. On the other hand, improvements in real sales and sales efficiency of the larger firms are greater than for the smaller firms. The mean (median) increase in real sales for the larger firms is 43.45 percent (21.37 percent) compared to 37.68 percent (16.78 percent) for the smaller firms, and the mean (median) improvement in sales efficiency for the larger firms is 6.82

¹³ For a detailed description of the Mann-Whitney test, see Zuwaylif (1984).

percentage points (0.37 percentage points) higher than for the smaller firms. The differences in improvements between the two sub-groups are significant at the five percent level for sales efficiency, but insignificant for real sales. Finally, the results show a significant difference (at the one percent level) in the employment change between the two sub-groups. Specifically, the mean (median) increase for the larger firms is 58 (48) employees while this increase is only 3 (8) employees for the smaller firms.

To sum up, for almost all criteria smaller firms show a greater performance improvement following equitisation than larger ones, thereby supporting the Harper (2002) hypothesis that smaller firms are more flexible in adjusting to the new environment.

Trade and services firms versus manufacturing firms

Performance comparisons of trade and services firms to manufacturing firms are presented in Table 6.4. The empirical findings show that after equitisation both sub-groups report significant changes in the predicted direction for all measures, except for leverage and employment. However, for different measures the pattern is different between the two subgroups. Indeed, greater changes in IBTA, IBTE, real sales, income efficiency, and employee income are found for the first sub-group. On the other hand, somewhat higher improvements in IBTS, sales efficiency, leverage, and employment are reported for the manufacturing firms. However, the Mann-Whitney test shows that the differences between the two subgroups are not statistically significant for all performance measures.

Firms with residual state ownership less than 30 percent versus firms with the residual state ownership greater than or equal to 30 percent

The results presented in Table 6.5 show that firms with residual state ownership of less than 30 percent have greater performance improvements in profitability, income efficiency, employment, and employee income than firms where residual state ownership is greater than or equal to 30 percent. For instance, the mean (median) gain in IBTS for the former sub-group is 4.02 percent (3.78 percent), while this increase for the latter is only 1.72 percent (1.92 percent). Moreover, it is found that the average employment increase for the firms with residual state ownership lower than 30 percent is 52 employees compared to 14 employees for the other group. However, the latter sub-group has greater improvements in real sales, sales efficiency and leverage. The differences found are, however, not statistically significant for any of the variables.

Table 6.3: Comparison of post-equitisation performance changes for larger and smaller firms

Measures	N	Mean (median) before	Mean (median) after	Mean (median) change	Z-Statistic for difference in medians (after – before)	Z-Statistic for difference in medians between sub-samples
IBTA						
Larger firms	55	0.0982 (0.0726)	0.1237 (0.1013)	0.0255 (0.0287)	1.73 ^c	1.33
Smaller firms	45	0.0879 (0.0767)	0.1251 (0.1159)	0.0372 (0.0392)	2.16 ^b	
IBTS						
Larger firms	60	0.0490 (0.0379)	0.0607 (0.0476)	0.0117 (0.0097)	1.79 ^c	3.42 ^a
Smaller firms	61	0.0728 (0.0432)	0.1075 (0.0843)	0.0347 (0.0411)	2.97 ^a	
IBTE						
Larger firms	60	0.2818 (0.2091)	0.2681 (0.2326)	-0.0137 (0.0234)	0.92	2.86 ^a
Smaller firms	61	0.1774 (0.1528)	0.2820 (0.2214)	0.1046 (0.0686)	3.56 ^a	
Sales efficiency						
Larger firms	58	1.0341 (1.0000)	1.4523 (1.1584)	0.4182 (0.1584)	3.12 ^a	2.04 ^b
Smaller firms	61	1.0074 (1.0000)	1.3628 (1.1547)	0.3554 (0.1547)	3.71 ^a	
Income efficiency						
Larger firms	58	1.0330 (0.9909)	2.7360 (1.3415)	1.7030 (0.3506)	6.15 ^a	2.24 ^b
Smaller firms	61	1.1479 (1.0000)	3.5995 (1.1911)	2.4516 (0.1911)	6.83 ^a	
Real sales						
Larger firms	60	1.0178 (0.9924)	1.4523 (1.2061)	0.4345 (0.2137)	6.22 ^a	0.16
Smaller firms	61	0.9920 (1.0000)	1.3688 (1.1678)	0.3768 (0.1678)	4.59 ^a	
Total debts/total assets						
Larger firms	55	0.5858 (0.6154)	0.5353 (0.5916)	-0.0505 (-0.0238)	1.20	1.70 ^c
Smaller firms	45	0.4616 (0.4487)	0.4583 (0.4742)	-0.0033 (0.0255)	0.05	
Number of employees						
Larger firms	58	596 (307)	654 (355)	58 (48)	0.79	3.92 ^a
Smaller firms	61	120 (93)	123 (101)	3 (8)	0.18	
Annual income per employee (million VND)						
Larger firms	40	14.2 (13.0)	17.8 (15.7)	3.6 (2.7)	2.25 ^b	0.28
Smaller firms	55	10.8 (9.6)	16.9 (12.7)	6.1 (3.1)	2.63 ^a	

^a, ^b, ^c Significant at the 1%, 5%, and 10% levels, respectively.

Table 6.4: Comparison of performance changes following equitisation for trade and services firms and manufacturing firms

Measures	N	Mean (median) before	Mean (median) after	Mean (median) change	Z-Statistic for difference in medians (after – before)	Z-Statistic for difference in medians between sub-samples
IBTA						
Trade and services firms	47	0.0764 (0.0673)	0.1102 (0.0807)	0.0338 (0.0134)	1.64 ^c	0.46
Manufacturing firms	53	0.1087 (0.0764)	0.1368 (0.1241)	0.0281 (0.0477)	2.13 ^b	
IBTS						
Trade and services firms	52	0.0681 (0.0365)	0.0894 (0.0607)	0.0213 (0.0242)	1.73 ^c	0.75
Manufacturing firms	69	0.0557 (0.0384)	0.0804 (0.0604)	0.0247 (0.0220)	2.97 ^a	
IBTE						
Trade and services firms	52	0.1875 (0.1757)	0.2456 (0.2237)	0.0581 (0.0480)	2.17 ^b	0.27
Manufacturing firms	69	0.2606 (0.1632)	0.2974 (0.2498)	0.0368 (0.0866)	2.59 ^a	
Sales efficiency						
Trade and services firms	51	1.0005 (0.9952)	1.2200 (1.1410)	0.2195 (0.1458)	2.80 ^a	0.64
Manufacturing firms	68	1.0353 (1.0000)	1.2955 (1.1599)	0.2602 (0.1599)	3.93 ^a	
Income efficiency						
Trade and services firms	50	1.1695 (0.9643)	3.5137 (1.5016)	2.3442 (0.5373)	5.59 ^a	0.78
Manufacturing firms	68	1.0509 (1.0000)	2.9790 (1.7970)	1.9281 (0.7970)	7.28 ^a	
Real sales						
Trade and services firms	52	0.9700 (0.9679)	1.3837 (1.1454)	0.4137 (0.1775)	5.16 ^a	0.32
Manufacturing firms	69	1.0310 (1.0000)	1.4303 (1.2524)	0.3993 (0.2524)	5.69 ^a	
Total debts/total assets						
Trade and services firms	47	0.5496 (0.5768)	0.5240 (0.5666)	-0.0256 (-0.0102)	0.42	0.93
Manufacturing firms	53	0.5125 (0.5451)	0.4799 (0.5288)	-0.0326 (-0.0163)	0.87	
Number of employees						
Trade and services firms	51	217 (87)	231 (103)	14 (16)	0.41	0.78
Manufacturing firms	68	453 (192)	495 (217)	42 (25)	0.50	
Annual income per employee (million VND)						
Trade and services firms	44	13.3 (11.1)	20.0 (15.3)	6.7 (4.2)	2.11 ^b	0.29
Manufacturing firms	51	11.3 (11.3)	14.9 (14.7)	3.6 (3.4)	2.64 ^a	

^a, ^b, ^c Significant at the 1%, 5%, and 10% levels, respectively.

Table 6.5: Comparison of performance changes following equitisation for firms with residual state ownership less than 30 percent and the other firms

Measures	N	Mean (median) before	Mean (median) after	Mean (median) change	Z-Statistic for difference in medians (after – before)	Z-Statistic for difference in medians between sub-samples
IBTA						
State ownership < 30%	59	0.0829 (0.0703)	0.1231 (0.1081)	0.0402 (0.0378)	2.55 ^a	0.79
State ownership ≥ 30%	41	0.1089 (0.0891)	0.1261 (0.1083)	0.0172 (0.0192)	1.06	
IBTS						
State ownership < 30%	59	0.0529 (0.0384)	0.0828 (0.0531)	0.0299 (0.0147)	2.71 ^a	1.52
State ownership ≥ 30%	41	0.0769 (0.0594)	0.0899 (0.0715)	0.0130 (0.0121)	1.02	
IBTE						
State ownership < 30%	59	0.2287 (0.1538)	0.2600 (0.2282)	0.0313 (0.0744)	2.54 ^a	1.06
State ownership ≥ 30%	41	0.2381 (0.2101)	0.2459 (0.2070)	0.0078 (-0.0031)	0.79	
Sales efficiency						
State ownership < 30%	59	1.0484 (1.0000)	1.1751 (1.1043)	0.1267 (0.1043)	1.79 ^c	1.42
State ownership ≥ 30%	39	0.9890 (1.0000)	1.2732 (1.1410)	0.2842 (0.1410)	3.12 ^a	
Income efficiency						
State ownership < 30%	59	1.1648 (0.9818)	4.2864 (1.9111)	3.1216 (0.9293)	5.96 ^a	1.76 ^c
State ownership ≥ 30%	38	1.0581 (0.9643)	1.7954 (1.4722)	0.7373 (0.5079)	5.47 ^a	
Real sales						
State ownership < 30%	59	1.0369 (0.9881)	1.3125 (1.1420)	0.2756 (0.1539)	4.34 ^a	1.17
State ownership ≥ 30%	41	0.9610 (0.9831)	1.4913 (1.1835)	0.5303 (0.2004)	5.17 ^a	
Total debts/total assets						
State ownership < 30%	59	0.5488 (0.5897)	0.5287 (0.5794)	-0.0201 (-0.0103)	0.43	0.88
State ownership ≥ 30%	41	0.5028 (0.5450)	0.4603 (0.5059)	-0.0425 (-0.0391)	0.88	
Number of employees						
State ownership < 30%	59	455 (163)	507 (173)	52 (10)	0.52	0.78
State ownership ≥ 30%	39	206 (152)	220 (134)	14 (-18)	0.60	
Annual income per employee (million VND)						
State ownership < 30%	44	13.1 (12.9)	20.3 (16.4)	7.2 (3.5)	2.32 ^b	0.38
State ownership ≥ 30%	30	12.7 (11.2)	16.9 (15.5)	4.2 (4.3)	2.68 ^a	

^{a, b, c} Significant at the 1%, 5%, and 10% levels, respectively.

Firms that have a chairperson of the board of directors representing the state (FCBDRS) versus firms that have a chairperson of the board of directors representing private investors (FCBDRP)

The empirical results, shown in Table 6.6, indicate that improvements in almost all performance measures are in line with expectations in that they are greater for the FCBDRP as compared to the FCBDRS. First, FCBDRP yield greater changes in profitability and real sales following equitisation. Indeed, the average increase in IBTA for the FCBDRP is 6.58 percent as opposed to 1.91 percent for the FCBDRS. Additionally, the mean (median) real sales increase for the latter subgroup is 44.91 percent (33.77 percent) against 35.56 percent (14.73 percent) for the former one. Secondly, the findings also confirm that FCBDRP trigger higher improvement in efficiency measures. In fact, mean (median) sales efficiency increase for the FCBDRP is 23.62 percent (13.90 percent) while this increase is only 16.94 percent (10.43 percent) for the FCBDRS. Surprisingly, the mean (median) leverage of the FCBDRP increases following equitisation (1.28 percentage points in mean and 2.72 percentage points in median) while the mean (median) leverage of the FCBDRS falls by 4.58 percentage points (4.06 percentage points) percent after equitisation. The Mann-Whitney test, however, reports that, except for the difference in real sales between the two sub-groups (significant at the five percent level), no significant differences are found for any of the other variables.

Listed versus non-listed firms

Table 6.7 presents comparisons of performance changes between listed and non-listed firms. As expected, higher increases in real sales, sales efficiency, and employment are observed for listed firms as compared to non-listed firms. The mean (median) real sales of listed firms increases by 60.73 percentage points (39.77 percentage points) following equitisation compared to an improvement of 37.02 percentage points (15.15 percentage points) for the non-listed firms. Moreover, Table 13 shows an average (median) increase of 58 employees (137 employees) for the listed firms as opposed to 25 employees (3 employees) for the non-listed ones. The differences are significant at the 10 percent level for real sales and at the five percent level for employment. Furthermore, the results show a greater decrease in leverage for the listed firms than for non-listed firms, but the difference is statistically insignificant. Contrary to the predictions, the findings indicate that non-listed firms have higher profitability improvements than listed firms. For instance, the mean (median) improvement in IBTS for non-listed firms is 2.66 percentage points (2.53 percentage points) compared to 0.40 percentage points (0.67 percentage points) for listed firms. In addition, the mean (median) IBTE of the non-listed firms increases by 6.66 percentage points (5.65 percentage points) while the mean (median) IBTE of listed firms decreases

by 7.18 percentage points (4.90 percentage points) following equitisation. Using the Mann-Whitney test it is found that the differences between the two subsamples are significant at the one percent level for IBTS and IBTE, and at the five percent level for IBTA. The results also show a significant difference (at the five percent level) in income efficiency improvement between these subgroups. Indeed, income efficiency of the non-listed firms increases by a mean (median) of 234.53 percentage points (79.46 percentage points) while this measure also increases in the case of the listed firms, but the gains are less impressive, only 67.35 percentage points (42.26 percentage points).

In general, the results indicate that listed firms show greater improvements in real sales, sales efficiency, leverage, and employment compared to non-listed firms. However, gains in profitability measures are lower for listed firms than for non-listed ones. These findings are consistent with those presented in Chapter 4, except for the IBTA and IBTE measures. A possible explanation for the differences is that by exploiting the benefits from the listing, listed firms substantially expand their business. This results in substantial increases in real sales and employment. The profit margin of listed firms is almost unchanged after equitisation while the total assets of the firms increase considerably due to business expansion. This causes the decrease in IBTA of listed firms following equitisation. The average leverage of listed firms falls in years following equitisation while their total assets increase. This results from increases in the equity of listed firms. Similar to the return on assets, the increase in equity explains the decline in IBTE of listed firms after equitisation.

Firms located in HCMC versus the other firms

Comparisons of performance improvements between firms located in HCMC and the other firms are shown in Table 6.8. As can be seen from the Table, only performance changes in IBTS and leverage show a statistically significant difference between two groups. Specifically, contrary to the prediction a significantly lower improvement in the median IBTS is reported for the group of firms in HCMC. In addition, firms located in HCMC have a significantly lower reduction in the median leverage than the other firms, but an insignificantly higher reduction in the mean leverage.

Firms equitised before 1999 versus the other firms

Performance changes following equitisation for firms equitised before 1999 and other firms are presented in Table 6.9. Statistically, the table shows no significant evidence that supports the expectation that the first group of firms have lower performance improvements than the second one. In other words, performance improvements of firms following equitisation do not depend on the period of equitisation.

Table 6.6: Comparison of performance changes following equitisation for FCBDRS and FCBDRP

Measures	N	Mean (median) before	Mean (median) after	Mean (median) change	Z-Statistic for difference in medians (after – before)	Z-Statistic for difference in medians between sub-samples
IBTA						
FCBDRS	72	0.0958 (0.0724)	0.1149 (0.1073)	0.0191 (0.0349)	2.19 ^b	1.41
FCBDRP	26	0.0895 (0.0762)	0.1553 (0.1311)	0.0658 (0.0392)		
IBTS						
FCBDRS	72	0.0679 (0.0433)	0.0878 (0.0646)	0.0199 (0.0213)	2.24 ^b	0.45
FCBDRP	26	0.0484 (0.0390)	0.0816 (0.0517)	0.0332 (0.0127)		
IBTE						
FCBDRS	72	0.2260 (0.1821)	0.2476 (0.2136)	0.0216 (0.0315)	1.76 ^c	1.46
FCBDRP	26	0.2430 (0.1538)	0.2720 (0.2409)	0.0290 (0.0871)		
Sales efficiency						
FCBDRS	71	1.0334 (1.0000)	1.2028 (1.1043)	0.1694 (0.1043)	2.63 ^a	0.35
FCBDRP	25	0.9963 (1.0000)	1.2325 (1.1390)	0.2362 (0.1390)		
Income efficiency						
FCBDRS	71	1.0494 (0.9543)	2.5701 (1.4890)	1.5207 (0.5347)	7.17 ^a	0.93
FCBDRP	24	1.3507 (0.9897)	5.6642 (2.2701)	4.3135 (1.2804)		
Real sales						
FCBDRS	72	1.0225 (0.9861)	1.3781 (1.1334)	0.3556 (0.1473)	4.86 ^a	2.28 ^b
FCBDRP	26	0.9545 (0.9710)	1.4036 (1.3087)	0.4491 (0.3377)		
Total debts/total assets						
FCBDRS	72	0.5469 (0.5901)	0.5011 (0.5495)	-0.0458 (-0.0406)	1.30	1.49
FCBDRP	26	0.4663 (0.4739)	0.4791 (0.5011)	0.0128 (0.0272)		
Number of employees						
FCBDRS	71	336 (165)	367 (161)	31 (-4)	0.34	0.81
FCBDRP	25	287 (100)	343 (115)	56 (15)		
Annual income per employee (million VND)						
FCBDRS	55	13.0 (12.4)	16.7 (16.3)	3.6 (3.9)	2.96 ^c	0.17
FCBDRP	19	12.8 (13.0)	25.5 (14.9)	12.7 (1.9)		

^a, ^b, ^c Significant at the 1%, 5%, and 10% levels, respectively.

Table 6.7: Comparison of performance changes following equitisation for listed firms and non-listed firms

Measures	N	Mean (median) before	Mean (median) after	Mean (median) change	Z-Statistic for difference in medians (after – before)	Z-Statistic for difference in medians between sub-samples
IBTA						
Listed firms	18	0.1380 (0.1067)	0.1265 (0.1229)	-0.0115 (0.0162)	0.24	2.46 ^b
Non-listed firms	82	0.0838 (0.0707)	0.1238 (0.1039)	0.0400 (0.0332)		
IBTS						
Listed firms	18	0.0963 (0.0659)	0.1003 (0.0726)	0.0040 (0.0067)	0.11	2.99 ^a
Non-listed firms	103	0.0549 (0.0337)	0.0815 (0.0590)	0.0266 (0.0253)		
IBTE						
Listed firms	18	0.3234 (0.3033)	0.2516 (0.2543)	-0.0718 (-0.0490)	0.74	3.14 ^a
Non-listed firms	103	0.2127 (0.1666)	0.2793 (0.2231)	0.0666 (0.0565)		
Sales efficiency						
Listed firms	17	1.0587 (1.0000)	1.4473 (1.3313)	0.3886 (0.3313)	3.38 ^a	0.35
Non-listed firms	102	1.0140 (1.0000)	1.2325 (1.0933)	0.2185 (0.0933)		
Income efficiency						
Listed firms	17	0.9944 (1.0000)	1.6679 (1.4226)	0.6735 (0.4226)	2.93 ^a	2.06 ^b
Non-listed firms	101	1.1191 (1.0000)	3.4644 (1.7946)	2.3453 (0.7946)		
Real sales						
Listed firms	18	1.0521 (1.0000)	1.6594 (1.3977)	0.6073 (0.3977)	4.57 ^a	1.65 ^c
Non-listed firms	103	0.9965 (0.9942)	1.3667 (1.1457)	0.3702 (0.1515)		
Total debts/total assets						
Listed firms	18	0.5156 (0.5306)	0.4711 (0.5392)	-0.0445 (0.0086)	0.36	0.31
Non-listed firms	82	0.5331 (0.5740)	0.5071 (0.5443)	-0.0260 (-0.0297)		
Number of employees						
Listed firms	17	850 (518)	908 (655)	58 (137)	0.38	2.39 ^b
Non-listed firms	102	269 (126)	294 (129)	25 (3)		

^{a, b, c} Significant at the 1%, 5%, and 10% levels, respectively.

Table 6.8: Comparison of performance changes following equitisation for firms located in Ho Chi Minh City (HCMC) and others firms

Measures	N	Mean (median) before	Mean (median) after	Mean (median) change	Z-Statistic for difference in medians (after – before)	Z-Statistic for difference in medians between sub-samples
IBTA						
Firms located in HCMC	58	0.0960 (0.0724)	0.1226 (0.1095)	0.0266 (0.0371)	2.12 ^b	0.14
Other firms	42	0.0902 (0.0807)	0.1267 (0.1048)	0.0365 (0.0241)	1.68 ^c	
IBTS						
Firms located in HCMC	58	0.0602 (0.0386)	0.0869 (0.0573)	0.0267 (0.0187)	2.54 ^b	1.75 ^c
Other firms	63	0.0618 (0.0378)	0.0819 (0.0624)	0.0201 (0.0246)	2.03 ^b	
IBTE						
Firms located in HCMC	58	0.2300 (0.1657)	0.2579 (0.2223)	0.0279 (0.0566)	1.66 ^c	1.13
Other firms	63	0.1993 (0.1872)	0.2910 (0.2500)	0.0917 (0.0628)	3.13 ^a	
Sales efficiency						
Firms located in HCMC	57	1.0233 (1.0000)	1.1896 (1.0801)	0.1663 (0.0801)	2.07 ^b	1.46
Other firms	62	1.0178 (1.0000)	1.3308 (1.1811)	0.3130 (0.1811)	4.79 ^a	
Income efficiency						
Firms located in HCMC	57	1.0187 (0.9272)	3.2802 (1.6373)	2.2615 (0.7101)	6.66 ^a	0.59
Other firms	62	1.1592 (1.0000)	3.0323 (1.6367)	1.8731 (0.6367)	6.15 ^a	
Real sales						
Firms located in HCMC	58	1.0254 (0.9895)	1.4291 (1.1193)	0.0437 (0.1298)	3.86 ^a	1.63
Other firms	63	0.9858 (1.0000)	1.3928 (1.2676)	0.4070 (0.2676)	6.99 ^a	
Total debts/total assets						
Firms located in HCMC	58	0.5580 (0.5868)	0.5013 (0.5703)	-0.0567 (-0.0165)	1.31	1.67 ^c
Other firms	42	0.4912 (0.5450)	0.4998 (0.5264)	0.0086 (-0.0186)	-0.00	
Number of employees						
Firms located in HCMC	57	450 (196)	495 (181)	45 (-15)	0.43	0.47
Other firms	62	262 (120)	278 (129)	16 (9)	0.41	
Annual income per employee (million VND)						
Firms located in HCMC	45	13.5 (13.0)	17.5 (16.4)	4.0 (3.4)	2.84 ^a	1.30
Other firms	50	11.0 (9.6)	17.1 (12.4)	6.1 (2.8)	2.18 ^b	

^a, ^b, ^c Significant at the 1%, 5%, and 10% levels, respectively.

Table 6.9: Comparison of performance changes following equitisation for firms equitised before 1999 and other firms

Measures	N	Mean (median) before	Mean (median) after	Mean (median) change	Z-Statistic for difference in medians (after – before)	Z-Statistic for difference in medians between sub-samples
IBTA						
Firms equitised before 1999	14	0.1342 (0.1002)	0.1791 (0.1619)	0.0449 (0.0617)	1.08	0.10
Other firms	86	0.0869 (0.0716)	0.1154 (0.0965)	0.0285 (0.0249)	2.45 ^b	
IBTS						
Firms equitised before 1999	14	0.0911 (0.0731)	0.1448 (0.1151)	0.0537 (0.0420)	1.49	1.58
Other firms	107	0.0571 (0.0375)	0.0764 (0.0531)	0.0193 (0.0156)	3.00 ^a	
IBTE						
Firms equitised before 1999	14	0.2790 (0.2209)	0.2925 (0.3019)	0.0135 (0.0810)	0.90	0.91
Other firms	107	0.2055 (0.1724)	0.2729 (0.2231)	0.0674 (0.0507)	3.23 ^a	
Sales efficiency						
Firms equitised before 1999	14	0.9802 (1.0000)	1.2429 (1.0151)	0.2627 (0.0151)	0.67	0.03
Other firms	106	1.0161 (1.0000)	1.2659 (1.1428)	0.2498 (0.1428)	4.90 ^a	
Income efficiency						
Firms equitised before 1999	14	0.9135 (1.0000)	2.8931 (1.4631)	1.9796 (0.4631)	3.47 ^a	0.26
Other firms	106	1.1051 (1.0000)	3.1864 (1.7493)	2.0813 (0.7493)	8.30 ^a	
Real sales						
Firms equitised before 1999	14	0.9686 (0.9992)	1.6161 (1.2826)	0.6475 (0.2834)	2.23 ^b	0.77
Other firms	107	1.0095 (0.9996)	1.3833 (1.1835)	0.3738 (0.1839)	7.33 ^a	
Total debts/total assets						
Firms equitised before 1999	14	0.4659 (0.3643)	0.3819 (0.3812)	-0.0840 (0.0169)	0.80	0.91
Other firms	86	0.5404 (0.5740)	0.5200 (0.5601)	-0.0204 (-0.0139)	0.60	
Number of employees						
Firms equitised before 1999	14	175 (89)	232 (121)	57 (32)	0.48	0.98
Other firms	106	372 (163)	402 (161)	30 (-2)	0.50	
Annual income per employee (million VND)						
Firms equitised before 1999	9	14.8 (15.3)	18.6 (16.0)	3.8 (0.7)	0.79	0.03
Other firms	86	12.0 (10.7)	17.1 (14.8)	5.1 (4.1)	3.25 ^a	

^{a, b, c} Significant at the 1%, 5%, and 10% levels, respectively.

6.4. The sources of performance changes: Cross-sectional regression results

To validate the nonparametric tests and to examine what determines differences in effects of equitisation, a cross-sectional regression is used to measure the sources of performance changes after equitisation. In the regression equations the dependent variables represent the percentage changes in income before tax on assets (PIBTA), income before tax on sales (PIBTS), income before tax on equity (PIBTE), real sales (PRS), sales efficiency (PSE), income efficiency (PIE) and employment (PEmp) following equitisation. To explain the changes in performance measures (dependent variables), size (log of pre-equitisation real sales average), residual state ownership, background of the chairperson of the board of directors, background of the chairperson of the board of supervisors, stock-market listing of firms, sectors, equitisation years and location of firms are employed as independent variables. It is important to note here that dummy variables for equitisation years are added to the regressions in order to control for macroeconomic factors that change over time and may affect the equitisation results. Definitions of explanatory variables used in the regression analyses are shown in Table 6.10.

The first equation used for each performance measure is:

$$Y_i = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \varepsilon_i \quad (1)$$

where Y_i represents the percentage change in a given performance measure. Then, based on the results of the first equation, some independent variables with a low t-value (less than one) are eliminated (hereafter the revised equation is referred to as the second equation). The results of the regression analyses from the first and second equations are shown in Table 6.11.

Profitability

Consistent with the results of Harper (2002) for the Czech Republic, the regression analyses show a significant negative relationship between profitability changes (PIBTA, PIBTS, and PIBTE) and firm size. Moreover, according to Table 6.11, corporate governance appears to be an important determinant to explain profitability changes of firms following equitisation. Specifically, the results indicate that the chairperson of the board of directors representing the state has a significant negative effect on PIBTA and PIBTE, and the chairperson of the board of supervisors representing the state has a significant negative effect on PIBTS. Contrary to expected signs, the regression analyses show a significant negative relationship between listing on the stock exchange and all profitability measures. The possible explanation for the negative impact of listing is presented in the previous section. Similarly,

Table 6.10: Definitions of explanatory variables used and expected sign in regression analyses

Variable	Definition	Expected sign
Size (X_1)	Log of pre-equitisation real sales average	Negative
State ownership (X_2)	Percent of shares owned by the state at the time of the first share issue	Negative
Chairperson of the board of directors (CBD) (X_3)	Dummy variable equal to 1 if the chairperson of the board of directors represents the state, 0 otherwise	Negative
Chairperson of the board of supervisors (CBS) (X_4)	Dummy variable equal to 1 if the chairperson of the board of supervisors represents the state, 0 otherwise	Negative
Listed firms (X_5)	Dummy variable equal to 1 if a firm is listed on the stock exchange, 0 otherwise	Positive
Trade and service (X_6)	Dummy variable equal to 1 if a firm is in the trade or service industries, 0 otherwise	Positive
Equitisation before 1999 (X_7)	Dummy variable equal to 1 if a firm is equitised before 1999, 0 otherwise	Negative
Equitisation in 2000 (X_8)	Dummy variable equal to 1 if a firm is equitised in 2000, 0 otherwise	Positive or negative
Equitisation in 2001 (X_9)	Dummy variable equal to 1 if a firm is equitised in 2001, 0 otherwise	Positive or negative
HCMC (X_{10})	Dummy variable equal to 1 if a firm is located in HCMC, 0 otherwise	Positive
The North (X_{11})	Dummy variable equal to 1 if a firm is located in the North, 0 otherwise	Positive or negative

regression results reveal that being part of the trade and service sector has a significant negative effect on PIBTE. Finally, it is found from Table 6.11 that the dummy variable for equitised firms in HCMC has a positive impact on PIBTS at the one percent significance level.

Overall, in line with the expectations regression results reveal a significant negative effect of corporate governance (X_3 and X_4) and firm size on the profitability improvements of equitised firms. In addition, a significantly greater improvement in PIBTS is reported for equitised firms in HCMC compared to firms in the other regions. Unexpectedly, the regression analyses provide evidence that listing on the

stock exchange and belonging to the trade and services sector have a significant negative impact on profitability improvements of equitised firms following equitisation.

Real sales

As predicted, Table 6.11 shows that firms where the chairperson of the board of directors represents the state have significantly lower improvements in real sales after equitisation than firms where the chairperson of the board of directors represents private owners. Specifically, firms in the former group show a 17.81 percentage points lower improvement, according to the first equation, in real sales than firms in the latter group. Additionally, the results derived from the regression analyses show a significant positive impact of stock-market listing on real sales change. According to the first regression equation, listed firms experience a 21.17 percentage points greater increase in real sales than non-listed firms. These results could mirror the effect hypothesised above that listed firms exploit the benefits from the listing through enlarging their business and market share. These benefits lead to a higher growth rate of sales compared to non-listed firms. Contrary to predictions, the results show a significant positive relationship between real sales and state ownership, and between real sales and the chairperson of the board of directors representing the state. Finally, findings presented in Table 6.11 indicate that equitised firms located in the North have a significantly greater improvement in real sales than the remaining firms.

Efficiency

First, the regression results for sales efficiency are discussed. The regression for this performance measure reveals a significant negative effect of firm size on the improvement in sales efficiency in the post-equitisation period. The employment regression shows a significant positive relationship between the size of firms and employment change. However, in the regression for real sales it is observed that size has a negative effect on real sales, although it is insignificant. Combination of these results may explain the negative relationship between size and sales efficiency. In addition, it is found that listed firms experience a significantly higher increase in sales efficiency than non-listed firms. Similar to the real sales measure, the regression results show that state ownership and the chairperson of the board of directors representing the state also have a significant positive impact on sales efficiency. Finally, results from the second regression equation indicate a significant positive relationship between sales efficiency and firms being located in

the North, but a significant negative relationship between sale efficiency and firms that have chairperson of the board of supervisors representing the state.

Beside the sales efficiency regression, an income efficiency regression is also conducted in this study. It turns out that firm size has a significant negative impact on the change in income efficiency. Moreover, the results obtained from the income efficiency regression confirm the prediction that state ownership has a negative effect on firm performance, including income efficiency. Specifically, according to the first equation, a one percent increase in state ownership causes a 5.40 percentage points decrease in income efficiency. This relationship is statistically significant at the one percent level. Similar to sales efficiency, the regression results show a significantly lower increase in income efficiency for FCBDRS as compared to FCBDRP. In fact, FCBDRS have a 93.01 percentage point lower improvement in income efficiency than FCBDRP. Contrary to what was found for sales efficiency, it is found that listing on the stock exchange has a significant negative impact on income efficiency. However, the significant negative effect is only reported in the second regression equation. In fact, the listed firms' gain in income efficiency is 83.58 percentage points lower than the non-listed firms'.

Generally, the findings indicate that firm size, residual state ownership, corporate governance and listing on the stock exchange are the major determinants of post-equitisation efficiency improvements. Specifically, the results reveal that firm size has significant negative effects on both efficiency measures. Moreover, the regression results show a significant negative relationship between state ownership and both efficiency measures, and between stock-exchange listing and the efficiency measures. Indeed, while state ownership has a positive effect on sales efficiency, the impact on income efficiency is negative. Finally, it turns out that the chairperson of the board of directors representing the state has a significant negative relationship with the efficiency measures, but the chairperson of the board of supervisors representing the state has a significant positive effect on sale efficiency.

Employment

According to the regression results, the size of firms and the background of the chairperson of the board of directors are the major determinants of the changes in employment following equitisation. Specifically, a significant positive relationship between size and employment change after equitisation is found. It suggests that larger size entails a greater increase in employment. A possible explanation for this relationship is that with a new capital source through issuing new shares after equitisation, large firms realise a greater expansion in their production and business

as compared to small firms. Greater expansion of business requires large firms to hire more employees compared to small firms. Further, firms with the chairperson of the board of directors representing the state show a significantly lower increase in employment compared to firms where the chairperson of the board of directors represents private owners.

6.5. Effect of equitisation on firm performance: Results from the difference-in-difference method

The difference-in-difference (DID) method is an approach that is developed to overcome the main shortcoming of the pre-post comparison method, that it ignores the concurrent impact of other determinants when measuring the impact of equitisation on firm performance¹⁴. The main characteristic of the DID method is that it helps to examine the impact of a policy or policy programme by comparing the difference in given measures of a treatment group over time - from before the policy was implemented until after its implementation - to the difference in the measures of the control group for the same periods.

In this study, the treatment group is formed by the equitised firms while the control group contains SOEs. Since most of the equitised firms in the sample were completely equitised in the year 2000 or 2001, the DID method is only applied to these groups. Moreover, due to insufficient data on the SOEs, only IBTA, IBTS, IBTE, real sales and the ratio of total debts to total assets are used as measures. Because of data limitations the differences in these measures, for both the treatment and the control group, are calculated on the basis of only one year before and after equitisation. Following the DID method, first the difference in the performance measures between before and after equitisation is computed for all individual firms in the treatment and control groups. Second, the mean (median) of the difference is separately calculated for the treatment and control groups. Then, the impact of equitisation on firm performance is examined as the difference between the differences in the performance measures for the two groups. Finally, to test for statistical significance of the difference in the performance measures between the treatment and control group, the non-parametric Mann-Whitney test is applied. Results of the DID method are shown in Tables 6.12 and 6.13.

¹⁴ For a detailed description of the DID method and a comparison between the DID and the pre-post comparison method, see Wooldridge (2002).

Table 6.11: Cross-sectional regression results

	PIBTA		PIBTS		PIBTE		PRS		PSE		PIE		PEmp.	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Constant	1.331 (2.97) ^a	12.163 (2.68) ^a	9.360 (5.63) ^a	9.379 (6.09) ^a	4.106 (3.65) ^a	36.669 (3.73) ^a	2.569 (0.09)	9.479 (1.31)	56.135 (1.93) ^c	69.751 (2.43) ^b	824.171 (4.56) ^a	839.457 (4.78) ^a	-20.632 (-0.95)	-10.616 (-0.558)
Size	-0.778 (-1.96) ^c	-0.648 (-1.57)	-0.804 (-5.40) ^a	-0.792 (-5.10) ^a	-2.717 (-2.74) ^a	-2.359 (-2.46) ^b	-0.121 (-0.04)	-	-7.529 (-2.98) ^a	-7.697 (-3.02) ^a	-34.236 (-3.26) ^a	-38.988 (-3.44) ^a	5.031 (2.33) ^b	3.518 (1.73) ^c
State ownership	0.018 (0.45)	-	-0.004 (-0.25)	-	-0.037 (-0.41)	-	0.737 (2.58) ^b	0.802 (3.80) ^a	0.770 (2.77) ^a	0.613 (2.44) ^b	-5.403 (-3.03) ^a	-5.409 (-3.51) ^a	0.082 (0.37)	-
CBD	-2.235 (-1.80) ^c	-1.883 (-1.60)	0.203 (0.43)	-	-5.104 (-1.76) ^c	-5.914 (-2.74) ^a	-17.809 (-2.08) ^b	-25.930 (-3.47) ^a	-12.611 (-1.43)	-13.080 (-1.67) ^c	-93.009 (-1.97) ^c	-110.516 (-2.21) ^b	-17.142 (-1.89) ^c	-20.559 (-2.51) ^b
CBS	-1.130 (-1.05)	-1.208 (-1.08)	-1.235 (-2.76) ^a	-1.132 (-2.55) ^b	-3.334 (-1.30)	-2.721 (-1.10)	21.267 (2.10) ^b	21.293 (2.89) ^a	20.743 (2.93) ^a	22.614 (3.21) ^a	-33.978 (-1.15)	-19.084 (-0.71)	-3.556 (-0.67)	-
Listed firms	-2.168 (-1.90) ^c	-3.436 (-2.57) ^b	-1.241 (-1.83) ^c	-1.254 (-1.73) ^c	-6.747 (-1.87) ^c	-7.491 (-2.61) ^b	21.173 (1.75) ^c	24.155 (2.13) ^b	33.776 (3.55) ^a	33.708 (3.44) ^a	-62.927 (-1.54)	-83.582 (-2.37) ^b	-7.442 (-1.05)	-4.551 (-0.74)
Trade and service	-0.205 (-0.21)	-	-0.450 (-1.08)	-	-4.320 (-1.84) ^c	-4.423 (-2.12) ^b	1.040 (0.14)	-	1.157 (0.18)	-	5.799 (0.22)	-	-3.170 (-0.57)	-
Equitisation before 1999	-1.527 (-0.77)	-	0.312 (0.36)	-	-0.831 (-0.21)	-	23.504 (1.74) ^c	17.178 (1.48)	11.048 (0.91)	-	-57.635 (-0.99)	-	7.950 (0.74)	-
Equitisation in 2000	-1.626 (-1.20)	-0.938 (-0.82)	0.133 (0.24)	-	2.166 (0.63)	-	5.254 (0.55)	-	6.100 (0.63)	-	-87.905 (-1.69) ^c	-62.098 (-1.67)	-8.848 (-0.96)	-
Equitisation in 2001	-1.630 (-1.22)	-1.378 (-1.22)	0.768 (1.17)	0.604 (1.31)	2.207 (0.57)	-	1.854 (0.25)	-	7.636 (0.79)	-	-53.307 (-1.07)	-4.006 (-0.12)	-4.564 (-0.47)	-
HCMC	0.942 (0.87)	-	1.521 (2.97) ^a	1.550 (3.52) ^a	-2.211 (-0.77)	-	1.502 (0.19)	-	12.324 (1.52)	11.077 (1.43)	-19.454 (-0.43)	-	-7.146 (-0.89)	-
The North	2.424 (1.32)	2.218 (1.63)	-1.379 (-1.03)	-1.338 (-1.05)	-0.637 (-0.10)	-	46.570 (2.04) ^b	43.229 (2.03) ^b	37.868 (1.37)	61.259 (4.82) ^a	-47.737 (-0.73)	-	6.368 (0.43)	-
Observations	84	84	84	84	84	84	84	84	84	84	56	56	91	91
Adjusted R ²	0.133	0.162	0.421	0.443	0.207	0.259	0.232	0.353	0.268	0.344	0.372	0.401	0.071	0.108
F-statistic	2.16 ^b	3.29 ^a	6.50 ^a	12.02 ^a	2.96 ^a	6.79 ^a	3.27 ^a	8.53 ^a	3.76 ^a	7.21 ^a	3.96 ^a	6.26 ^a	1.62	4.62 ^a

^{a, b, c} Significant at the 1%, 5%, and 10% level, respectively

t-values in parenthesis (they are based on White Heteroskedasticity-Consistent Standard Errors & Covariances)

(1) results from the first equation, and (2) results from the second equation

Table 6.12 presents results of the DID method for the group of former SOEs equitised in the year 2000. As can be seen from the Table, all profitability measures of the equitised firms increase significantly (after taking into account the difference in differences) following equitisation. Specifically, the mean (median) gains in IBTA and IBTS are 1.72 percentage points (2.36 percentage points) and 1.19 percentage points (1.10 percentage points) respectively. Similarly, the mean (median) increase in IBTE is 3.90 percentage points (10.32 percentage points). Statistically, the performance improvements are significant at the 10 percent level for IBTA and at the five percent level for IBTS and IBTE. Moreover, Table 6.12 reveals that the mean real sales of equitised firms increase by 19.8 percentage points, but the median slightly decreases (2.75 percentage points) after equitisation. The decrease in the median real sales is statistically significant at the five percent level. Finally, results of the DID method show that the leverage of equitised firms is almost unchanged following equitisation.

Similarly, results from the DID approach for the group of SOEs equitised in the year 2001, presented in Table 6.13, indicate that profitability and real sales measures of equitised improve, after adjusting for other effects, following equitisation. However, only the performance improvements in IBTA and IBTS are significant at the five percent level. Contrary to the expectation, the leverage of the equitised firms increases after equitisation, although the increase is statistically insignificant.

To conclude, the results of the DID approach are generally consistent with the results of the pre-post comparison method reported in Section 6.3. Indeed, they provides evidence that equitisation has a significant positive effect on profitability measures of equitised firms after equitisation. In addition, findings from both methods reveal that equitisation has no impact on equitised firms' leverage. However, regarding the real sales measure results from the employed methods are somewhat different. Specifically, the results of the pre-post comparison method show a significant increase in median real sales while those of the DID method show a significant decrease (for the first group of equitised firms) or an insignificant increase (for the second group of equitised firms).

6.6. Summary and conclusions

This chapter examines the effects of equitisation, the Vietnamese version of privatisation, on firm performance in Vietnam by using data of 121 firms that were equitised during the 1993-2002 period and 84 SOEs. Applying the methodology of Megginson, Nash and Randenborgh (1994), the study documents a significant increase in profitability, operating efficiency, real sales, and employee income of

Table 6.12: Summary of results from the DID test for the group of SOEs equitised in the year of 2000

Measures	Control group (SOEs)			Treatment group (equitised firms)			Mean (median) change between two groups	Z-Statistic for difference in medians between two groups		
	N*	Mean (median) for the year of 1999	Mean (median) for the year of 2001	Mean (median) change	N*	Mean (median) pre-equitisation (1999)			Mean (median) post-equitisation (2001)	
Profitability										
IBTA	51	0.1587 (0.1236)	0.1628 (0.1279)	0.0041 (0.0043)	40	0.0940 (0.0723)	0.1153 (0.1002)	0.0213 (0.0279)	0.0172 (0.0236)	1.9071 ^c
IBTS	51	0.0962 (0.0791)	0.0976 (0.0860)	0.0014 (0.0069)	56	0.0531 (0.0332)	0.0664 (0.0511)	0.0133 (0.0179)	0.0119 (0.0110)	2.1675 ^b
IBTE	51	0.4423 (0.3296)	0.4518 (0.2698)	0.0095 (-0.0598)	56	0.2194 (0.1753)	0.2679 (0.2187)	0.0485 (0.0434)	0.0390 (0.1032)	2.2299 ^b
Real sales	51	0.8968 (0.8649)	1.0042 (1.0491)	0.1074 (0.1842)	56	0.9754 (1.0000)	1.2815 (1.1567)	0.3061 (0.1567)	0.1987 (-0.0275)	2.0053 ^b
Leverage (Total debts/total assets)	51	0.5856 (0.6160)	0.5344 (0.5444)	-0.0512 (-0.0716)	40	0.5491 (0.5701)	0.5027 (0.4900)	-0.0464 (-0.0801)	0.0048 (-0.0085)	0.5237

^b, ^c: Significant at the 5% and 10% levels respectively

* N: Number of observations

Table 6.13: Summary of results from the DID test for the group of SOEs equitised in the year of 2001

Measures	Control group (SOEs)			Treatment group (equitised firms)			Mean (median) change between two groups	Z-Statistic for difference in medians between two groups		
	N*	Mean (median) for the year of 1999	Mean (median) for the year of 2001	Mean (median) change	N*	Mean (median) pre-equitisation (1999)			Mean (median) post-equitisation (2001)	
Profitability										
IBTA	48	0.1619 (0.1209)	0.1657 (0.1399)	0.0038 (0.0190)	29	0.0835 (0.0732)	0.1136 (0.1075)	0.0301 (0.0343)	0.0263 (0.0153)	2.0763 ^b
IBTS	48	0.0934 (0.0664)	0.0948 (0.0584)	0.0014 (-0.0080)	32	0.0644 (0.0558)	0.0883 (0.0711)	0.0239 (0.0153)	0.0225 (0.0233)	2.3914 ^b
IBTE	48	0.5474 (0.3311)	0.5632 (0.3193)	0.0158 (-0.0118)	32	0.1885 (0.1799)	0.2241 (0.2042)	0.0356 (0.0243)	0.0198 (0.0361)	1.4781
Real sales	48	0.9432 (0.8530)	1.1319 (1.1173)	0.1887 (0.2643)	32	1.0104 (1.0000)	1.3156 (1.2898)	0.3052 (0.2898)	0.1165 (0.0255)	0.5647
Leverage (Total debts/total assets)	48	0.5960 (0.6370)	0.5882 (0.6140)	-0.0078 (-0.0230)	29	0.5382 (0.5882)	0.5431 (0.5839)	0.0049 (-0.0043)	0.0127 (0.0187)	0.3417

^b Significant at the 5% level

firms following equitisation (all significant at the one percent level). Moreover, we find an increase in employment and a decrease in leverage for the equitised firms following equitisation, although the increases are not statistically significant.

Regarding the sources of the performance improvements of firms after equitisation, the empirical findings derived from cross-sectional regression indicate that the size of firms (measured by log of pre-equitisation real sales average) has significant negative effects on changes in the profitability and efficiency measures, but a significant positive impact on employment change of equitised firms. In addition, the results reveal that ownership and corporate governance are key determinants of the performance improvements of firms after equitisation. Specifically, the findings show a significant negative relationship between state ownership and the change in before-tax income on sales, and between state ownership and the change in income efficiency. Similarly, the regression analyses point out that firms which have a chairperson of the board of directors who represents the state experience a significantly lower increase in real sales, sales efficiency, income efficiency, and employment compared to firms having a chairperson of the board of directors from the private sector. Finally, the results show a significant negative effect of stock-market listing on profitability changes and income efficiency improvement. However, being listed has a significant positive impact on real sales and sales efficiency changes.

Based on the empirical results obtained from the pre-post comparison, it can be concluded that equitisation in Vietnam has positive effects on firm performance. However, this method suffers from the shortcoming that it ignores the concurrent impact of other determinants when measuring the impact of equitisation on firm performance. To overcome this shortcoming, the DID method is employed in this chapter. The outcomes of the DID analysis confirm that the performance improvements of equitised firms are indeed associated with equitisation.