THE SUCCESS OF CHINA'S NON-TRADABLE SHARE REFORM

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Abstract

This paper examines the impact of the Non-tradable Share (NTS) Reform on the financial and operating performance of China's listed firms, using a sample of 563 state-owned enterprises (SOEs) that were partially-privatized through share issue privatizations (SIPs) from 1994 to 1998 and then carried out the NTS reform from 2005 to 2008. We find that the NTS reform has greatly improved firm profitability (measured by real net profit, real EBIT, return on sales and EBIT to sales), output (measured by real sales), operating efficiency (measured by real sales, real net profit and real EBIT per employee) and employment (measured by total employment). The positive effect of the NTS reform on firm operating performance is much stronger than that of the first round SIPs. The regression results show that the decrease of state ownership control is a significant determinant of the increase of firm profitability after the NTS reform.

Keywords: Non-Tradable Share Reform, Operating Performance, China

JEL Codes: G32, G38

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We are grateful for helpful comments from Qin Gou, Song Shi, Candie Chang, Andrea Bennett, and participants in seminars at Massey University and Jiangxi Normal University and participants at the 4th Chinese Capital Markets Conference. All remaining errors are our own.

1. Introduction

The success of ongoing economic reform and privatization in China has drawn attention of the policy makers, academics and practitioners. China carried out its first round privatization in 1990 and 1991 as signaled by the establishment of the Shanghai and Shenzhen Stock Exchanges and the partial share issue privatizations (SIPs). Although most non-Chinese studies (such as Megginson, Nash and Randenborgh, 1994; Boubakri and Cosset, 1998) show that privatization greatly improves the financial and operating performance of former SOEs, studies indicate that China's first round privatization is far from being successful (Lin, Cai and Zhou, 1998) and SIP firms' profitability decreases after the first round privatization (Sun and Tong, 2003; Jiang, Yue and Zhao, 2009). Problems existing with first round SIPs include inefficiency and under-development of the Chinese stock markets, still strong state control after SIPs and the inefficient corporate governance of SIP firms (Jiang, et al., 2009).

In April 2005, China carried out the split-share structure reform, also known as the non-tradable share (NTS) reform, aiming to make all non-tradable shares[3] tradable gradually. By doing so, the tradable share proportions and market liquidity will increase and the privatization can be further carried out (Liao, Liu and Wang, 2014). The limited success for SIP firm performance is mainly due to the fact that SIPs have been revenue privatization[4] in newly established stock markets. However, we believe that the NTS reform could potentially improve firm performance for the following three reasons. First, the increase of

[3] The existence of NTS is due to the partial privatization of the first round SIPs. NTS cannot be traded in the stock markets and typically belong to the state or to domestic companies ultimately owned by the central or local governments, while tradable shares are owned by domestic and foreign individual investors as well as institutional investors. As of February 2005, NTS accounted for approximately two thirds of shares in the Chinese stock markets, which caused major problems in China's stock markets (discussed further in Section 2.2).

[4] Revenue privatization refers to that the government retains shareholdings of more than 50% after the privatization.

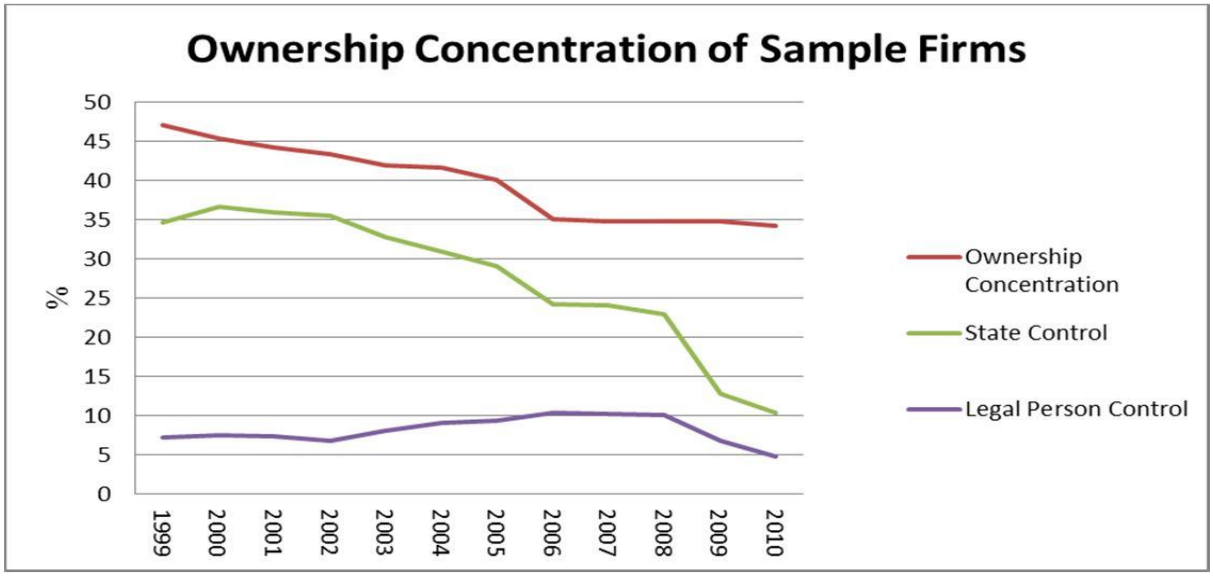
tradable share proportions after the NTS reform could contribute to the development of an outside market in corporate control (Jiang, Laurenceson and Tang, 2008). With the possible increase of liquidity, market monitoring and corporate governance, firm operating performance should improve. Second, according to Sun and Tong (2003), the reason for the limited success of China's first round privatization is that state ownership still dominates within listed companies and this has a negative impact on firm performance, as the primary mission of state-owned enterprises (SOEs) is to serve the government's fiscal and social economic objectives (Shleifer, 1998; Shleifer and Vishny, 1997). Shleifer (1998) also documents that state ownership can result in a lack of incentive to minimize costs or to innovate. Figure 1 shows that state ownership control of our sample firms fell from 35% to 10% from 1999 to 2010 (pre to post the NTS reform). With decreased state control, firms would have more chance to pursue market-orientated objectives, which in turn could improve productivity and operating efficiency. Third, D'Souza, Megginson and Nash (2005) indicate that capital market characteristics are highly related to a firm's post privatization performance. Gupta (2005) investigates the effect of partial privatization on firm performance in India. The results show that both the level and the growth rate of profitability and labour productivity improve significantly following partial privatization. He argues that though management control is not transferred to private owners in partial privatization, the stock market can play a positive role in monitoring and rewarding managerial performance. In comparison with the first round SIPs, the Chinese stock markets have made significant improvement on commercialization, market capitalization, market regulations and market mechanisms at the time of the NTS reform. The improved market conditions could increase the post-privatization performance.

In this paper, we investigate to what extent the NTS reform has been successful by examining firm operating performance changes. Using a total sample of 563 SOEs that went public through SIPs from 1994 to 1998 and then carried out the NTS reform from 2005 to 2008, we study the financial and operating performance of sample firms between pre and post the NTS reform. We also compare the NTS reform results with the results of the first round SIPs. Although evidence shows significant increases in absolute earnings and output after both reforms, we find that the profitability (measured by return on sales (ROS) and EBIT to sales (EBITS)) significantly decreases after the first round privatization, but significantly increases after the NTS reform. Moreover, operating efficiency and employment increase significantly after the NTS reform.

To further confirm and investigate our results, we employ regression analyses, with ROS and EBITS as the dependent variables. We create a reform year dummy and use panel data regressions to analyze whether the NTS reform is a significant determinant for profitability improvements. The results confirm our expectation. In addition, we examine the impact of the change of state ownership concentration (three years before to three years after the NTS reform) on firm performance change. We find evidence that a decrease of state ownership control after the NTS reform has a significantly positive impact on firm profitability.

Figure 1. Ownership concentration change of sample firms from 1999 to 2010

This Figure reports the ownership concentration change for our sample firms from 1999 to 2010. Ownership Concentration refers to the percentage of shares held by the largest shareholder. State Control refers to the percentage of shares held by the State if the State is the largest shareholder. Legal Person Control refers to the percentage of shares held by the legal persons if a legal person is the largest shareholder.



Our study contributes to the literature in the following ways. First, due to the short history of the NTS reform, there are few studies examining the operating performance change after the NTS reform. As a major Chinese government economic reform, it is important for policy makers and the investors to know the extent of its success. Second, given one of the purposes of the NTS reform is to boost privatization in China, we find empirical evidence that reducing state control can significantly increase firm profitability, which provides support for policy makers to carry out the privatization scheme further.

The remainder of this paper is organized as follows. Section 2 provides the literature review, privatization background and hypothesis development. Section 3 describes the data and the methodology. Section 4 shows the empirical results on performance changes before and after the two reforms and the relationship between the change of state control and performance change around the NTS reform. Section 5 concludes.

2. Literature review, privatization background and hypothesis development

2.1 Post-privatization performance in non-Chinese markets

The goals of privatization are to promote increased efficiency, introduce competition, expose SOEs to market discipline, encourage foreign investment, foster wider share ownership and raise revenue for the state (Megginson and Netter, 2001). A World Bank study shows that "since 1980, more than 2000 SOEs have been privatized in developing countries, 6,800 worldwide" (Kikeri, Nellis and Shirley, 1992, p2). A considerable number of studies have examined the post-privatization performance, and find that after being privatized former SOEs become more profitable and efficient in most developed and developing countries.

By using information of 61 companies from 18 countries and 32 different industries during the period 1961 to 1990, Megginson, Nash and Randenborgh (1994) find that there are significant increases in profitability (measured by return on sales, return on assets and return on equity), output per employee (measured by real sales), capital spending (measured by ratios of capital expenditures to sales and capital expenditures to assets) and total employment. These indicate strong performance improvements without sacrificing employment security. Moreover, these firms are able to lower their debt levels and increase dividend payouts. Furthermore, using a sample of 129 SIPs from 23 developed (OECD) countries, D'Souza et al. (2005) document significant increases in profitability, efficiency, output and capital expenditure following privatization and indicate that ownership (both private and foreign), degree of economic freedom and level of capital market development significantly affect post-privatization performance.

In addition, by examining the performance changes of 79 companies from 21 developing countries from 1980 to 1992, Boubakri and Cosset (1998) document that newly privatized firms exhibit significant increases in profitability, operating efficiency, capital investment spending, real sales, employment level and dividends. Moreover, using a sample of 230 firms in 32 developing countries, Boubakri, Cosset and Guedhami (2005) document a significant increase in profitability, efficiency, investment and output. Their analysis also shows that the changes in performance vary with the extent of macro-economic reforms and environment and the effectiveness of corporate governance. Furthermore, control relinquishment by the government is a key determinant of post-privatization performance improvement.

2.2 First round privatization in China and the post-privatization performance

Up to late 1970s, the Chinese economy was a strictly planned economy, controlled by the government, including capital allocation process, production plans and labor markets. However, SOEs were highly unproductive and inefficient. As a result, China embarked on its economic reform gradually and begun its modernization program.

The first round privatization began with the establishment of the Shanghai and Shenzhen Stock Exchanges in 1990 and 1991 and the first wave of partial SIPs, which initially divested government ownership of some Chinese SOEs. However, China's first round privatization is a partial share issue privatization in newly established stock markets. Studies on Chinese first round of privatization reveal mixed results on performance changes of privatized firms. Sun and Tong (2003) examine 634 SIP firms and show that there are improvements in absolute earnings, real sales and employee productivity after SIPs, while both return on sales and earnings on sales decrease significantly, which is known as the "profitability puzzle" in China.

Huang and Song (2005) find significant declines in profitability, efficiency and leverage ratio after H-firms[5] going public, while the output of these H-firms experiences a gradual and steady increase following privatization. Moreover, based on a sample of 149 SIP firms during the period 1998 to 2003, Jiang, Yue and Zhao (2009) confirm that the absolute level of SIP firm profitability decreases after privatization. Overall, these results are much less favorable than the evidence found in other countries, and suggest that there is very limited success in the first round of privatization, especially on profitability. Some researchers even claim that China first round

[5] H-firms are the firms that are incorporated in mainland China and listed in the Hong Kong Stock Exchange.

privatization is "nothing but a logo" or just "old wine in new bottles" (Xu and Wang, 1997).

Jiang, Yue and Zhao (2009) analyze three problems associated with the early SIP firms in China. First, the actual control of partially privatized firms is still in the state's hand, as the main purpose of the SIPs was just to raise capital for the SOEs, rather than the state giving up control of these firms. Second, the Chinese stock markets have a lack of effective and efficient market institutions and mechanisms to protect minority investors. Third, the management of SIP firms has not improved much and is still accountable to the government controlling shareholders.

Another side-effect of the first round privatization in China is the split-share structure, where there are tradable shares and non-tradable shares existing at the same time in listed firms. The split-share structure is perceived to be harmful for listed firms and the Chinese stock markets. First, Wu (2006) indicates that this structure leads to a conflict of interest between tradable shareholders and non-tradable shareholders. Non-tradable shareholders capture benefits mainly from tradable shareholders, rather than from the improvement of profitability and enhancement of the company's competitiveness. Using excess debt, non-tradable shareholders can expropriate the interests of tradable shareholders to realize the rapid increase of their assets value (Liu and Tian, 2012). Second, the split-share structure has a negative impact on the pricing function of the capital markets. The lack of market-oriented mergers and acquisitions cause the Chinese capital market to become a pure speculation market (Luo, 2007). Although merger and acquisition activities are numerous, mergers and restructuring have become an important means for tunneling (expropriating firm assets) by major shareholders of listed companies. Third, as tradable shares only count for approximately one third of the total shares outstanding and are owned by many individual shareholders, tradable shareholders have no incentive or capability to monitor firm management, leading to poor corporate governance in Chinese listed firms (Li, Wang, Cheung and Liang, 2011).

2.3 Non-tradable share reform and hypothesis development

Over the years, the Chinese government has recognized that the predominance of non-tradable shares has badly affected the market's proper development and expansion[6]. Therefore, in April 2005, China formally started the split-share structuring reform (or called the NTS reform). The key objective of the NTS reform is to convert the non-tradable shares into tradable shares gradually and to create liquidity in the stock markets (Beltratti, Bortolotti and Caccavaio, 2010). At the same time, the NTS reform offers further opportunity for privatization in the Chinese stock markets with increased liquidity of state-owned shares (Liao et al., 2014).

The reform enforces the holders of non-tradable shares to compensate holders of tradable shares in exchange for the possibility to publicly trade their shares in the future. The issuing price of non-tradable shares is usually much lower than that of tradable shares of the same firm. To make non-tradable shares tradable and have the same value as the tradable shares in the stock markets, non-tradable shareholders have to provide some compensation to tradable shareholders. Li et al. (2011) document that the compensation can be in the forms of cash payment, paying stock dividends to tradable shareholders, transferring shares from non-tradable shareholders to tradable shareholders, issuing new share capital only to tradable shareholders and issuing warrants to shareholders, and cash payment and paying stock dividends to tradable shareholders are the most popular approaches. According to the regulations of the China Securities Regulatory Commission (CSRC), there is a twelve-month lockup period to limit previous non-tradable shares be traded or transferred in order to stabilize the stock market. After expiration of the lock-up, non-tradable shareholders are further prohibited from trading more than 5% (or 10%) of the company's total shares within 12 (or 24) months. By the end of 2006, more than 80% of the listed firms in China had successfully participated in the NTS reform program. (Yeh, Shu, Lee and Su, 2009)

We believe that the NTS reform would have a positive impact on firm operating performance for the following reasons.

First, Beltratti, Bortolotti and Caccavaio (2010) state that although the NTS reform has little immediate direct impact on the structure of the Chinese stock markets as the actual change of shares from non-tradable to tradable takes time, the reform will affect positively the fundamentals of the Chinese stock markets (e.g., increase in the available float with positive implications for liquidity and enhancement of the market for corporate control). Jiang, Laurenceson and Tang (2008) also point out that increasing the tradable share proportion might better facilitate the development of an outside market in corporate control. The increased corporate governance after NTS reform should be beneficial to firm operating performance.

Second, Liao et al. (2014) state that the NTS reform would provide opportunities and lead to further privatization in China. As Jiang, Yue and Zhao (2009) document that one of the reasons for the limited success of the first round SIPs is that the state still remains the control of most SIP firms. Although there is no definite answer on the effect of the state-owned shares on firm performance[7], a number of

[6] People's Daily, June 28, 2005.

[7] The impact of state ownership on firm performance is controversial. Some studies argue that state ownership is the

studies claim that the key determinant of post-privatization performance improvement is the control relinquishment by the government (Boubakri, et al., 2005; D'souza, Megginson and Nash, 2001). D'souza et al. (2001) suggest that relinquished control provides privatized firms greater entrepreneurial opportunities. They explore the determinants of performance improvements following privatization by utilizing a sample of 118 firms privatized via public share offerings between 1961 and 1995, and find that ownership is the most significant determinant of change in post-privatization performance. In addition, using a sample of 127 Chinese listed companies that have had ownership control transferred from the government to private owners, Huang and Wang (2011) explore the effect of ultimate privatization on the performance of Chinese listed firms and find that the transfer of control to private owners enhances operating efficiency and profitability significantly. Therefore, the possible decrease of state control after the NTS reform should lead to improved operating performance.

Third, in comparison with the first round SIPs, Chinese stock markets had developed significantly by the time when the NTS reform took place. D'Souza et al. (2005) indicate that the characteristics of specific capital markets are highly related to the firm performance following privatization. Megginson (2005) also suggests that a very important step in a successful SOE privatization is "commercialization, which means converting the mission of the enterprise from maximizing social welfare to maximizing economic profits, as well as developing new private-sector operating procedures and policies" (p.73). Moreover, The World Bank (1995) suggests that in developing countries, institutional reform must be accomplished before privatization to capture the benefits of divestiture. According to Long, Tsui and Zhang (2014), by the end of 2009, the Chinese stock market has emerged to be the world's second-largest stock market by market capitalization. Moreover, the Chinese government has launched intensive and extensive reforms in the last decade which have improved substantially the regulatory system, the market-oriented appraisal system for initial public offerings (IPOs) as well as the corporate governance of listed firms in some extent. A further privatization in the more developed Chinese stock markets should lead to better operating performance. Thus, we hypothesize the following:

H1: The NTS reform has a positive effect on firm operating performance.
H2: The decrease of the state control has a positive effect on firm operating performance following the NTS reform.

3. Data and methodology

3.1 Data

Our sample includes 563 listed SOEs[8] that undertook the share issue privatizations (first round of privatizations) during the year 1994 to 1998, and then carried out the NTS reform from 2005 to 2008. As we study firm performance from three years pre to three years post the reform, our sample is chosen to avoid overlapping in investigating firm accounting performance. Overall, the financial data ranges from the year 1991 to 2010[9]. We collect the data from the China Stock Market and Accounting Research Database (CSMAR), National Bureau of Statistics of China (NBSC) and WIND Financial Database. We select firms privatized from 1994 as China changed accounting standards to be closer to international norms, taking effect from January 1994. The pre-listing data were recompiled by the auditing firms using new standards, so the accounting standard is identical between pre and post-listing (Sun and Tong, 2003).

Table 1 shows the distribution of our sample. Panel A documents the distribution based on the time of the first round SIPs and the time of the NTS reform. There are 33% of sample firms which began the first round of privatization in 1997, followed by 29.1% in 1996. While in 1995, only 4.3% of companies conducted share issue privatizations. The NTS reform started in 2005. Approximately a quarter of sample firms carried out reforms in 2005 (25.8%), while the majority reformed in 2006 (71.6%). There are only six and nine sample firms carrying out reforms in 2007 and 2008, respectively. According to the CSMAR database, our sample firms can be classified into six industries as shown in Panel B: commerce, conglomerates, finance, industrial, properties and public utility. Over half of our sample consists of industrial firms (55.4%), followed by the conglomerates (13.7%) and commerce (12.4%). In addition, Table 1 panel C shows that 52.8% of the sample is from the East region. Firms located in the West and Central regions are made up of 22.7% and 15.6% of the sample, respectively. Only 8.9% of the sample comes from the Northeast district.

origin of immense agency problems in SOEs (Sun and Tong, 2003), and it may undermine the performance of firms (Shleifer and Vishny, 1986, 1997; Jiang, Yue and Zhao, 2009), while other researchers assert that state ownership has a positive effect on firm performance particularly in developing and transition economies (Claessens and Djankov, 1998; Omran, 2002).

[8] To ensure these are state-owned companies, we check the ownership structure of these firms after SIPs and we only include firms with state ownership after SIPs as our sample firms.

[9] Due to data limitation, the accounting statements end in 2010. Therefore, for the nine companies, which had their NTS reforms in 2008, they only have two years of annual accounting data after the reform.

Table 1. Distribution of sample firms based on time of the reform, industry and location

This table documents the distribution of the sample. Our sample includes 563 SOEs that conducted SIPs during the period from 1994 to 1998, and took part in the NTS reform from 2005 to 2008. Panel A reports the number of firms took part in the first round of privatization (share issue privatization) and the NTS reform by year. Panel B reports the information about the classification of industry while panel C shows the four regional distributions of sample firms.Panel A: SIP and NTS reform samples.

Reform Year	SIP Sample	% Total	Reform Year	NTS Reform Sample	% Total
1994	96	17.1	2005	145	25.8
1995	24	4.3	2006	403	71.6
1996	164	29.1	2007	6	1
1997	186	33	2008	9	1.6
1998	93	16.5			
Total number of firms	563	100	Total number of firms	563	100

Panel B: Industry	Number of Sample Firms	% Total	Panel C: Location	Number of Sample Firms	%Total
Commerce	70	12.4	East	297	52.8
Conglomerates	77	13.7	Central	88	15.6
Finance	8	1.4	West	128	22.7
Industrials	312	55.4	Northeast	50	8.9
Properties	51	9.1	Total	563	100
Public Utility	45	8			
Total	563	100			

3.2 Methodology in measuring and comparing firm operating performance

We employ the MNR 1994 (Megginson, Nash and Randenborgh, 1994) methodology and follow the study of Sun and Tong (2003) to measure firm performance changes before and after both the SIPs and the NTS reform. We examine six areas of the firm performance, namely: absolute earnings, profitability, operating efficiency, output, employment and leverage. Appendix A presents the definitions of the performance measures.

To ensure that it is reasonable and valid to compare the performance changes between the first round privatization and the NTS reform, we utilize the variables in Sun and Tong (2003) to consider the special features of SOE privatization in China. We employ real net profit[10] (RNP) and return on sales (ROS) as the main profitability measures, as they avoid the problem of mechanical increase in equity through primary issues (Sun and Tong, 2003). Moreover, real EBIT (REBIT) and EBIT to sales (EBITS) are used as the additional measures for profitability. Given data availability, we test the operating efficiency (measured by real sales or real net profit or real EBIT to number of employees) and number of employment just around the NTS reform.

Following Megginson, Nash and Randenborgh (1994), we compute performance proxies for every firm for a seven-year period: from three years before to three years after both the first round of privatization and the NTS reform. Then we calculate the mean (median) of each variable for each firm over the pre- and post-privatization windows. For all firms, the year of privatization was excluded from the mean (median) calculations. Having computed pre- and post-privatization means (median), we use the t-test and the Wilcoxon z-test to examine whether the difference on performance measures between pre and post-privatizations issignificant. We also carry out a proportion z-test to see if the proportion of positive or negative change is greater than 50%.

3.3 Regression analyses

To further test our two hypotheses, we use regression analyses. First, we investigate how the NTS reform affects firm profitability, by creating a reform year dummy. The reform year dummy equals one for the reform year and the post-reform years, otherwise it equals zero. As in Liu and Tian (2012), the NTS reform has an exogenous impact on firm performance because the Chinese government implements the reform for all listed firms. The panel data regression model is expressed as follows.

$$\text{Profitability}it = \alpha it + \beta 1\text{YRDUM}it + \beta 2\text{SIZE}it + \beta 3\text{LEVE}it + \beta 4\text{BOARD}it + \beta 5\text{INDEP/BOARD}it + \beta 6\text{GDP}it + \varepsilon it \quad (1)$$

[10] Real net profit is calculated by adjusting a firm's annual net profit with the annual inflation rate taken from National Bureau of Statistics of China (NBSC). The figures are then normalized to one in the year of privatization. We use the same method to compute real EBIT, real sales and all the operating efficiency ratios.

ROS and EBITS are used as the dependent variables to measure firm profitability. We employ the following control variables: SIZE (natural logarithm of total assets), LEVE (total debt divided by total assets), BOARD (the natural logarithm of the total number of directors on the board), INDEP/BOARD (the percentage of independent directors on the board) and GDP (annual growth of real GDP). Appendix B lists the definitions of variables and their expected signs in the regression. We also report the descriptive statistics of all variables in Table 2.

Table 2. Summary descriptive of all variables

Table 2 presents summary descriptive of dependent variables and independent variables. Dependent variables include ROS and EBITS. Independent variables include ownership concentration measures LASH, STLA, LPLA, STLAD and LPLAD; and SIZE, LEVE, BOARD, INDEP/BOARD, as well as GDP. Panel A reports summary descriptive of the variables in panel data regressions. It consists of 563 sample firms for the time period from 1999 to 2010. Panel B presents summary descriptive of the variables in cross-section regressions. This sample consists of 544 out of 563 total sample firms due to some missing data. "Δ" in panel B is the difference of the three-year before the NTS reform and the three-year after the reform measures.

Panel A: Summary descriptive of all variables in panel data regressions

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROS	6548	0.0335	0.3180	-3.3891	1.3510
EBITS	6548	0.0382	0.3445	-5.3055	3.3162
SIZE	6548	21.3049	1.1093	16.6943	26.1563
LEVE	6548	0.5248	0.3377	0.0081	7.1440
BOARD	6548	2.2144	0.2333	1.3863	2.9444
INDEP/BOARD	6548	0.2606	0.1531	0.0000	0.6667
GDP	6548	10.0583	1.8102	7.6000	14.2000
LASH	6548	39.8402	16.6433	3.5000	84.9800
STLAD	6548	0.6257	0.4840	0	1
LPLAD	6548	0.2445	0.4298	0	1

Panel B summary descriptive of all variables in cross-section regressions

Variable	Obs.	Mean	Std. Dev.	Min	Max
ΔROS	544	0.0302	0.2852	-2.6861	1.6601
ΔEBITS	544	0.0089	0.3165	-2.6198	2.2579
ΔSIZE	544	0.1714	0.2852	-0.9134	1.5711
ΔLEVE	544	0.0377	0.4232	-4.5811	4.5453
ΔBOARD	544	-0.0592	0.1769	-0.9808	0.5108
ΔINDEP/BOARD	544	0.0298	0.0576	-0.1746	0.4192
ΔSTLA	544	-10.9849	16.4274	-69.7700	61.4200
ΔLPLA	544	0.8750	14.5308	-68.7933	64.2333

To test the second hypothesis, we first examine the impact of the state control on firm profitability using panel data regression with industry-, location- and year-fixed effect and firm fixed effect. Chen, Firth and Xu (2009) argue that distinct types of owners have different objectives and motivations and this will affect how they exercise their control rights over the firms they invest in. We use a firm's largest shareholding and a state dummy to test the impact of state control on firm profitability. We also use a firm's largest shareholding and a legal person dummy to provide a robustness check, as the state and the legal person ownerships are the two major ownerships in Chinese listed companies[11]. We also conduct the Granger causality regressions using panel date to address possible endogenous concern[12].

Then we use cross sectional regression to test the impact of the state control change on firm profitability change around the NTS reform. This approach allows us to rule out the possible change in the general level of economic activity before and after the reform, which may be a reason for changes in firm attributes (Dewenter and Malatesta, 2001). For a robustness check, we also add the change of legal person control as another independent variable in the cross sectional regression to control for this effect. The panel and cross sectional regressions are shown below.

$$\text{Profitability}it = \alpha it + \beta 1\text{LASH}it + \beta 2\text{STLAD}it / \text{LPLAD}it + \beta 3\text{SIZE}it + \beta 4\text{LEVE}it + \beta 5\text{BOARD}it + \beta 6\text{INDEP/BOARD}it + \varepsilon it \quad (2)$$

$$\text{Profitability}i = \alpha i + \beta 1 \text{ STLA}i \text{ (and LPLA}i) + \beta 2 \text{ SIZE}i + \beta 3 \text{ LEVE}i + \beta 4 \text{ BOARD}i + \beta 5 \text{ INDEP/BOARD}i + \varepsilon i \quad (3)$$

LASH is the percentage of shares held by the largest shareholder. STLAD and LPLAD are dummy variables, which equal one if the largest shareholder is a state agent (or a state-owned company) or a legal person, otherwise equal zero. STLA and LPLA represent the percentage of the shares held by the largest shareholder, which is a state agent (or a state-owned company) and a legal person, respectively. The sign " " is to use the three-year average after the NTS

[11] In China, generally there are six types of shares in a listed firm, namely the state, legal person, foreign, management, employee and individual shares.

[12] The results are consistent. Due to size limitation, the results are not reported and available on request.

reform measures minus the three-year average before the NTS reform measures.

4. Results

4.1 Results on the performance changes following the two reforms

4.1.1 Profitability changes

Following Sun and Tong (2003), we measure profitability change using both absolute earnings and profitability ratios. First, we investigate the changes in real net profit (RNP) and real EBIT (REBIT) from prior to post privatization. Panel A in Table 3 illustrates the results of first round of privatization while Panel B shows the performance changes around the NTS reform. As shown, the means (medians) RNP and REBIT increase significantly after both reforms. The t-tests, Wilcoxon z-tests and proportion z-tests all show that absolute earning improvement is significant at the 1% level. The significant improvement in real net profit after the first round privatization is consistent with the results in Sun and Tong (2003).

Table 3. Performance changes following the two reforms

This table presents the operating performance we examine for changes arising from the two reforms. Definitions of the operating performance measures are shown in Appendix A. Panel A reports the results from the first round privatization. We employ the t-test to test the significance of changes in the mean values, and use the Wilcoxon z-test to test the significance of changes in median values. We compute performance proxies for every firm for a seven- year period: three years before to three years after the privatizations. Then we calculate the mean and median of each variable for each firm over the pre- and post-privatization windows. For all firms, the year of privatization was excluded from the mean and median calculations. We also carry out a proportion z-test to examine if the proportion of positive or negative change is greater than 50%. *** indicates significance at the 1% level. ** indicates significance at the 5% level. * indicates significance at the 10% level.

Panel A: Performance changes following the first round privatization

Character	Variables	N	Before		After		Mean Change (After-Before) t-test	Median Change (After-Before) Wilcoxon test	+ve/-ve Ratio (Prop. Z)
			Mean	Medium	Mean	Median			
Absolute Earnings	RNP	526	0.6429	0.5425	1.1589	1.1300	0.5160 (7.8133)***	0.5875 (12.228)***	412/113 (12.9934)***
	REBIT	455	0.6330	0.5667	1.1214	1.1026	0.4884 (8.3441)***	0.5359 (11.102)***	343/112 (10.8294)***
Profitability	ROS	524	0.1618	0.1231	0.1026	0.1190	-0.0593 (-4.3784)***	-0.0041 (-3.068)***	241/283 (-1.8348)*
	EBITS	451	0.1796	0.1428	0.1000	0.1332	-0.0796 (-3.8362)***	-0.0096 (-4.673)***	185/266 (-3.8141)***
Output	SAL	535	0.7121	0.7033	1.5626	1.3333	0.8505 (20.3172)***	0.6300 (18.260)***	473/59 (17.7691)***
Leverage	LEV	271	0.5720	0.6004	0.3900	0.3783	-0.1820 (-18.2297)***	-0.2221 (-12.507)***	31/240 (-12.6958)***

Interestingly, when we measure the profitability using ratios, we observe different results on the two reforms. Panel A in Table 3 shows that the means (medians) ROS and EBITS decrease significantly at the 1% level after the first round of privatization, which is consistent with the findings of Sun and Tong (2003), suggesting that there is deterioration after the first round privatization when profitability is measured in ratio forms. In contrast, Panel B in Table 3 presents the means (medians) ROS and EBITS increase significantly from the 10% to 1% levels, indicating significant profitability improvements after the NTS reform. The opposite results on ROS and EBITS changes around the two reforms imply that the NTSreform is more successful regarding the profitability improvement. We will further investigate this result using regression analyses in the following sections.

Table 3. Performance changes following the two reforms, continued

This table presents the operating performance we examine for changes arising from the two reforms. Definitions of the operating performance measures are shown in Appendix A. Panel B reports the results from the NTS reform. We employ the t-test to test the significance of changes in the mean values, and use the Wilcoxon z-test to test the significance of changes in median values. We compute performance proxies for every firm for a seven-year period: three years before to three years after the NTS reform. Then we calculate the mean and median of each variable for each firm over the pre- and post-reform windows. For all firms, the year of the reform was excluded from the mean and median calculations. We also carry out a proportion z-test to examine if the proportion of positive or negative change is greater than 50%. *** indicates significance at the 1% level. ** indicates significance at the 5% level. * indicates significance at the 10% level.

Panel B: Performance changes following the NTS reform

Character	Variables	N	Before		After		Mean Change t-test	Median Change Wilcoxon test	+ve/-ve Ratio (Prop. Z)
			Mean	Median	Mean	Median			
Absolute Earnings	RNP	548	0.2770	0.6164	0.9031	0.8587	0.6261	0.2423	324/224
							(2.7500)***	(4.725)***	(4.2718)***
	REBIT	555	0.3727	0.5699	1.2191	1.0240	0.8464	0.4541	375/180
							(2.4934)**	(7.475)***	(8.2773)***
Profitability	ROS	556	-0.2047	0.0304	0.0665	0.0415	0.2712	0.0111	305/251
							(2.2467)**	(2.813)***	(2.2901)**
	ROA	553	0.0077	0.0223	0.0155	0.0298	0.0078	0.0075	294/254
							(0.9548)	(1.713)*	(1.4884)
	EBITS	554	-0.0808	0.0300	0.0305	0.0483	0.1113	0.0183	317/237
							(1.6820)*	(4.355)***	(3.3989)***
Operating Efficiency	SALEFF	557	1868.41	499.00	1818.19	580.00	-50.00	81.00	348/208
							(-0.1679)	(4.419)***	(5.8896)***
	NPEFF	553	65.53	16.86	85.78	23.43	20.25	6.57	315/238
							(1.0545)	(2.370)**	(3.2744)***
	EBITEFF	554	92.43	15.01	159.67	30.91	67.24	15.90	344/210
							(3.6268)***	(5.837)***	(5.6931)***
Output	SAL	555	1.2359	0.8571	1.6302	1.1481	0.3943	0.2910	353/200
							(3.0048)***	(7.107)***	(6.4096)***
Employment	EMPL	560	3146.88	1782.83	4045.13	1989.67	898.24	236.84	299/261
							(5.4038)***	(4.148)***	(1.6058)**
Leverage	LEV	554	0.5528	0.5212	0.6032	0.5538	0.0504	0.0326	333/221
							(2.0103)**	(5.171)***	(4.7584)***
	OCF/TD	554	0.1411	0.1039	0.1284	0.0980	-0.0270	-0.0059	272/282
							(-0.9504)	(-0.890)	(-0.4249)

4.1.2 Output changes

Megginson, Nash and Randenborgh (1994) document that real sales increase following privatization due to better incentives, more flexible financing opportunities, increased competition and greater scope for entrepreneurial initiative resulted from privatization. However, Boycko, Shleifer and Vishny (1994) argue that effective privatization will lead to a reduction in output, since the government can no longer entice managers (through subsidies) to maintain inefficient high output levels. Table 3 shows that real sales increase significantly at the 1% level after the two reforms in China, and our findings are consistent with the results of Sun and Tong (2003) when studying China's first round privatization.

4.1.3 Employment changes

A concern of all governments is that efficiency and profitability improvement after privatization might be attained at the cost of extensive layoffs (Megginson, Nash and Randenborgh, 1994; Boubakri and Cosset, 1998). Therefore, employment is typically an important issue in privatizing SOEs (Sun and Tong, 2003). Due to the lack of employee data, we are not able to compute the employment changes on the first round privatization. According to Sun and Tong (2003), the median employment in the first round of

privatization increases from 1,478 workers before privatization to 1,849 workers after SIPs. Also, there are 63 out of 112 firms exhibiting employment increase and only 49 firms exhibit employment decrease. However, these changes are not statistically significant.

Panel B in Table 3 shows that our sample firms experience an increase in the mean (median) of employment from 3,147 (1,783) before the NTS reform to 4,045 (1,990) after the reform.

Both the t-test and Wilcoxon z-test are significance at the 1% level. Meanwhile, the proportion z-test shows that 53.39% of firms experience an increase in employee numbers, which is significant at the 5% level. These results suggest that the NTS reform increases employee numbers significantly.

4.1.4 Operating efficiency changes

Megginson, Nash and Randenborgh (1994) point out that, by throwing an SOE into market competition, governments clearly hope that these firms will utilize their human, financial and technological resources more efficiently. In removing the noneconomic objectives from their SOEs, governments explicitly state that the trade-off they expect is increased operating and financial efficiency.

We employ three measures, namely real sales per employee (SALEFF), real net profit per employee (NPEFF) and real EBIT per employee (EBITEFF), to calculate the operating efficiency. Due to the lack of data on the number of employee, we are not able to test these efficiency measures for the first round of privatization. Panel B in Table 3 shows that the medians of all three measures increase significantly at the 5% or 1% level after the NTS reform, although only the mean of EBITEFF experiences a significant increase at the 1% level. Overall, there is an improvement in operating efficiency after the NTS reform. Together with the results on increased employment number after the NTS reform, we can see that the improved operating efficiency after the NTS reform is not due to the layoffs.

4.1.5 Leverage changes

It is expected that leverage of former SOEs would drop after privatization in that a government's removal of debt guarantees will increase the cost of borrowing and in that the former SOEs will have increased access to public equity markets (Megginson et al., 1994; Boubakri and Cosset, 1998). Most studies document leverage declines in firms after privatization, especially after SIPs (Megginson, Nash and Randenborgh, 1994; Boubakri and Cosset, 1998). Following Megginson et al. (1994) and Sun and Tong (2003), we measure leverage using the total debt to total assets (LEV) and the operating cash flow to total debt (OCF/TD). OCF/TD implies "a firm's ability to cover total debt with the yearly cash flow" (Gibson, 1995).

Panel A in Table 3 illustrates that the mean (median) LEV declines significantly at the 1% level after the SIPs. However, we should note that the decrease of LEV after the first round privatization is a result of a significant increase of equity. Due to data limitation, LEV is the only leverage measure we could use in the first round of privatization. However, Panel B in Table 3 shows that leverage increases after the NTS reform. The mean and median LEV increases are significant at the 5% and 1% levels, respectively. Meanwhile, the measure of OCF/TD shows declines in mean and median although the changes are not statistically significant. The reason for the leverage increase following the NTS reform could be that borrowing is still a major source for fund-raising in China, as there are strict criteria for issuing seasoned equity offerings and the corporate bond market is still underdeveloped. In addition, borrowing might be necessary to pay for the compensation to the tradable shareholders during the NTS reform.

4.2 Results on regression analyses

4.2.1 Impact of the NTS reform on firm profitability

Our results in Section 4.1 show that profitability, output, operating efficiency and employment all improve significantly after the NTS reform, and the changes on profitability ratios after the NTS reform are the opposite to those after the first round privatization. To further confirm our results and understand the relationship between the change of profitability ratios and the NTS reform, we conduct panel data analysis utilizing 563 sample firms for the time period from 1999 to 2010. We create a reform year dummy which equals one for the reform year and post-reform years and expect the dummy variable to be positively related to ROS and EBITS. Consistent with our hypothesis 1, Table 4 shows that the coefficients on the reform year dummies are positive at the 1% significance level[13] Among the control variables, firm size shows a positive impact on ROS and EBITS, whereas a high debt ratio has a negative impact on ROS and EBITS as one would expect. On the other hand, the coefficients on BOARD and INDEP/BOARD are both insignificant. Interestingly, the result suggests that the GDP growth has a negative impact on firm profitability after controlling for location and industry fixed effect.

[13] We have tested for heteroskedasticity, and there is no concern on this issue.

Table 4. Panel data regression analysis on the impact of the NTS reform on firm performance

This table presents empirical results of the panel data regression on the impact of the NTS reform on firm profitability:
$Profitability_{it} = \alpha_{it} + \beta_1 YRDUM_{it} + \beta_2 SIZE_{it} + \beta_3 LEVE_{it} + \beta_4 BOARD_{it} + \beta_5 INDEP/BOARD_{it} + \beta_6 GDP_{it} + \varepsilon_{it}$
Profitability measures include ROS and EBITS. ROS is the return on sales and EBITS is the operating income per sales. YRDUM is a dummy variable that takes the value of one in the NTS reform year and post-reform years, otherwise equals zero. SIZE is the natural logarithm of total assets. LEVE is the ratio of total debt to total assets. BOARD is the natural logarithm of total number of directors on the board, while INDEP/BOARD is the percentage of independent directors on the board. GDP is the annual growth of real GDP. The panel data consists of 563 listed firms during the period 1999 to 2010. Meanwhile, we control location dummies and use industry fixed-effect regression. There are total 6548 firm- year observations. In addition, we have tested for heteroskedasticity and there is no concern on this issue. *** indicates significance at the 1% level. ** indicates significance at the 5% level. * indicates significance at the 10% level.

	ROS	EBITS
YRDUM	0.0924***	0.0916***
SIZE	0.0483***	0.0616***
LEVE	-0.2554***	-0.3390***
BOARD	-0.0261	-0.0142
INDEP/BOARD	0.0465	0.0569
GDP	-0.0227***	-0.0246***
Observations	6548	6548
Location Dummies	Yes	Yes
Industry fixed effect	Yes	Yes
R^2	0.1209	0.1604

4.2.2 Impact of state control on firm profitability

Table 5 reports the panel data regression results on the impact of state control on firm profitability[14]. Panel A shows the results with industry-, location-, and year-fixed effect, Panel B shows the results with firm fixed effect as the use of firm-fixed effects helps mitigate the effects of firm-specific characteristics that are not controlled for but may have an impact on profitability.

Overall, ownership concentration has a significantly positive impact on ROS and EBITS. This result is consistent with those of Ng, Yuce and Chen (2009), Wang, Xu and Zhu (2004), and Ma, Naughton and Tian (2010). However, the coefficient on the state control dummy is significantly negative, indicating that although ownership concentration has a positive impact on firm profitability, the ownership concentration identity is crucial on this relationship. Given the state control and the legal person control are the two major ownership concentration identities in China, we re-run this regression using the largest shareholding and legal person control dummy and find that the positive impact of ownership concentration on firm profitability is mainly driven by the legal person control. Our results are consistent with Sun and Tong (2003) in that legal person ownership has a positive impact, while state ownership has a negative impact on firm performance. All other control variables have the similar effects on profitability as shown in Table 4.

4.2.3 Cross sectional analysis

Table 6 shows the impact of ownership concentration change (between the three-year before and three-year after the NTS reform) on firm profitability changes (between the three-year before and three-year after the NTS reform)[15]. The results show that the change of state control has significantly negative impact on firm profitability change, indicating that the significant improvement of firm profitability after the NTS reform is driven by the decrease of the state control. Our results confirm hypothesis 2 and provide the evidence that state control relinquishment is a key determinant for performance improvement of privatized firms, as in Boubakri et al. (2005).

[14] We have tested for heteroskedasticity, and there is no concern on this issue.

[15] We have tested for heteroskedasticity, and there is no concern on this issue.

Table 5. Panel data analysis of the impact of state ownership concentration on firm performance

This table presents empirical results of the impact of ownership concentration on firm performance: $Profitability_{it} = \alpha_{it} + \beta_1 LASH_{it} + \beta_2 STLAD_{it}/LPLAD_{it} + \beta_3 SIZE_{it} + \beta_4 LEVE_{it} + \beta_5 BOARD_{it} + \beta_6 INDEP/BOARD_{it} + \varepsilon it.$
Panel A reports the results of industry-, location- and year-fixed effect, and Panel B reports the results of firm fixed effect. We also conduct the Granger causality regressions to address possible endogenous concern. The results are not reported and available on requests.
Profitability refers to ROS and EBITS. ROS is the return on sales and EBITS is the operating income per sales. LASH is the percentage of shares held by the largest shareholder. STLAD is a dummy equal to 1 if the largest shareholder is a state agent or a state-owned company, otherwise equal to 0. LPLAD is a dummy equal to 1 if the largest shareholder is a legal person, otherwise equal to 0. SIZE is the natural logarithm of total assets. LEVE is the ratio of total debt to total assets. BOARD is the natural logarithm of the total number of directors on the board, while INDEP/BOARD is the percentage of independent directors on the board. We have tested for heteroskedasticity, and there is no concern on this issue.
*** indicates significance at the 1 percent level. ** indicates significance at the 5 percent level. * indicates significance at the 10 percent level.

		ROS	**EBITS**	
LASH	0.0014***	0.0015***	0.0012***	0.0013***
STLAD	-0.0150*		-0.0237***	
LPLAD		0.0382***		0.0396***
SIZE	0.0451***	0.0462***	0.0595***	0.0603***
LEVE	-0.2541***	-0.2564***	-0.3388***	-0.3407***
BOARD	-0.0136	-0.0116	-0.0025	-0.0014
INDEP/BOARD	0.0517	0.0478	0.0574	0.0563
Observations	6548	6548	6548	6548
Location Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
$_R2$	0.1223	0.1242	0.1651	0.1664
Panel B:				
	ROS		**EBITS**	
LASH	0.0014***	0.0012***	0.0012**	0.0009*
STLAD	-0.0349***		-0.0524***	
LPLAD		0.0659***		0.683***
Observations	6548	6548	6548	6548
Year Dummies	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
$_R2$	0.1180	0.1189	0.1622	0.1635

Table 6. Cross sectional regression analysis of the impact of state ownership concentration change on firm performance change

This table presents empirical results of the cross-sectional regression analysis of the impact of state control change on firm performance change based on the following model:
$Profitability_i = \alpha_i + \beta_1 \ STLA_i$ (and $LPLA_i$) $+ \beta_2 \ SIZE_i + \beta_3 \ LEVE_i + \beta_4 \ BOARD_i + \beta_5 \ INDEP/BOARD_i + \varepsilon_i$
" " is to use the three-year after reform measures minus the three-year before reform measures. Profitability refers to ROS and EBITS. ROS is the return on sales and EBITS is the operating income per sales. STLA represents the fraction of shares owned by the state if the largest shareholder is the State. LPLA represents the fraction of shares owned by the legal persons if the largest shareholder is a legal person. SIZE is the natural logarithm of total assets. LEVE is the ratio of total debt to total assets. BOARD is the natural logarithm of the total number of directors on the board, while INDEP/BOARD is the percentage of independent directors on the board. Meanwhile, we control location dummies, year dummies and industry dummies. This sample consists of 544 out of 563 total sample firms due to some missing data. The robust standard errors are clustered by industry. In addition, we have tested for heteroskedasticity, and there is no concern on this issue. *** indicates significance at the 1% level. ** indicates significance at the 5% level. * indicates significance at the 10% level.

	ROS		**EBITS**	
STLA	-0.0011**	-0.0000	-0.0029***	-0.0014***
LPLA		0.0028**		0.0037**
SIZE	0.0720	0.0649	0.1590**	0.1497**
LEVE	-0.1887**	-0.1814**	-0.2586**	-0.2489**
BOARD	0.1035**	0.1028**	0.1362*	0.1351*
INDEP/BOARD	0.1935	0.1528	0.3307	0.2767
Observations	544	544	544	544
Location Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
R^2	0.1450	0.1602	0.2136	0.2354

To check the robustness of this result, we add the change of legal person control between the three-year before and three-year after the NTS reform as an additional independent variable.

The results on the impact of state control change on profitability change remain.

5. Conclusions

We examine the impact of the NTS reform on firm operating performance using a sample of 563 listed SOEs that were partially privatized through share issue privatizations from 1994 to 1998, and then took part in the NTS reform from 2005 to 2008. We find evidence of significant improvements in profitability, output, operating efficiency and employment, but an increase of firm leverage after the NTS reform. In comparison with the performance change of the sample firms after the first round privatization, the major difference is that the profitability measures of ROS and EBITS increase significantly following the NTS reform while these two measures decline significantly after SIPs.

Overall, our findings suggest that in comparison with the SIPs (the first round privatization) the NTS reform in China has a greater success on firm operating performance, especially on profitability. Therefore, making non-tradable shares tradable has been an important step in the development of China's stock markets. Our regression analysis also confirms that the NTS reform does have a significantly positive impact on firm profitability and decrease of the state control is a significant determinant for profitability improvement in these firms.

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APPENDIX A

Definitions of operating performance measures utilized in the t-test and the Wilcoxon z-test

This table reports the definitions of the performance measures we utilize in Table 3, which examines performance changes arising from the two reforms. Real net profit is calculated by adjusting a firm's annual net profit with the annual inflation rate. The figures are then normalized to one in the year the firm privatized so other year figures are defined as a fraction of the year of privatization. Real EBIT and real sales are computed similarly. Likewise, operating efficiency is calculated using the same procedure but is in thousand dollars per employee. Also, EBIT refers to earnings before interests and tax (or called "operating profit" in China).

Characteristics	Proxies	Formula
Profitability	Return on Sales (ROS)	ROS= Net Profit/ Sales
	EBIT to Sales (EBITS)	EBITS= EBIT/ Sales
	Return on Assets (ROA)	ROA= Net profit/ Assets
Absolute Earnings	Real Net Profit (RNP)	RNP= Net Profit/ Consumer Price Index (CPI)
	Real EBIT (REBIT)	REBIT= EBIT/ CPI
Operating Efficiency	Sales Efficiency (SALEFF)	SALEFF= Real Sales/ Number of Employees
	Net Profit Efficiency (NPEFF)	NPEFF= Real net profit/ Number of Employees
	EBIT Efficiency (EBITEFF)	EBITEFF= Real EBIT/ Number of Employees
Output	Real Sales (SAL)	SAL= Nominal Sales/ CPI
Employment	Total Employment (EMPL)	EMPL= Total Number of Employee
Leverage	Debt to Assets (LEV)	LEV= Total Debt/ Total Assets
	The Operating Cash Flow to Total Debt (OCF/TD)	OCF/TD= The Operating Cash Flow/ Total Debt

APPENDIX B

Definitions of explanatory variables used in regression analyses

The following table defines the empirical variables used in our regression models to identify potential determinants of profitability changes.

Proxy	Variable	Expected sign	Measure
YRDUM	The reform year dummy	+	Take the value of one in the NTS reform year and post-reform years, otherwise equal zero.
SIZE	Size of firms	+	Natural logarithm of total assets
LEVE	Leverage of debt	-	Total debt divided by total assets
BOARD	The size of firm board	+/-	Natural logarithm of the total number of directors on the board
INDEP /BOARD	Independent directors/board	+/-	Percentage of independent directors on the board
GDP	Growth in gross domestic product	+	Annual growth of real GDP
LASH	Largest shareholding	+	Percentage of shares held by the largest shareholder
STLA	Ratio for state control	-	Percentage of the shares held by the largest shareholder, which is a state agent or a state-owned company
LPLA	Ratio for legal person control	+	Percentage of the shares held by the largest shareholder, which is a legal person
STLAD	State control dummy	-	Equal one if the largest shareholder is a state agent (or a state-owned company), otherwise equal zero.
LPLAD	Legal person control dummy	+	Equal one if the largest shareholder is a legal person, otherwise equal zero.
Location	Location of sample firms	+/-	A dummy equals one if the firm is located in a particular region, otherwise equals zero. The East region includes Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan; the Central region includes Shanxi (Taiyuan), Anhui, Jiangxi, Henan, Hubei, and Hunan; the West region includes Inner Mongolia, Guangxi, Chongqin, Sichuan, Guizhou, Yunnan, Tibet, Shanxi (Xi'an), Gansu, Qinghai, Ningxia, and Xinjiang; the Northeast region includes Liaoning, Jilin, and Heilongjiang.
Industry	Industry classification of sample firms	+/-	A dummy equals one if the firm is from a particular industry, namely commerce, conglomerates, properties, finance, industrials and public utility.