



# State equity ownership and firm market performance: evidence from China's newly privatized firms

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## Abstract

This research examines the relation between state equity ownership and firm market performance for China's newly privatized firms in 1994 (164 firms), 1995 (175 firms), and 1996 (252 firms). The overall results show that state ownership has a negative effect on firm value. Tobin's  $Q$  is convex with respect to state ownership, such that newly privatized firms gained capital and higher market values, with their increased size paying off in terms of stock returns. The effect of international ownership is unpredictable and domestic institutional ownership does not appear to improve performance, possibly because the latter lack proper incentives to positively influence the firm's management. The results further show that firm performance is not an important determinant of state ownership, but rather, firm size and its strategic industry status are the main determinants of the state's equity ownership in China's newly privatized firms.

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## 1. Introduction

China's economic reform is in its third decade and shows a great progress because of numerous reform initiatives and measures (see [Goodhart and Xu, 1996](#)). One of the most important of these is the share issue privatization (SIP) of medium- to large-size state-

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owned enterprises (SOEs).<sup>2</sup> China essentially institutionalized the privatization of its SOEs with its establishment of the Shanghai Securities Exchange in 1990 and the Shenzhen Securities Exchange in 1991. At year-end 1998, 931 firms had listed shares on these exchanges, with a 1998 capitalization of Chinese renminbi yuan (R¥) 5728.6 billion (approximately US\$690 billion in 1998 values) and 34 million shareholders.<sup>3</sup> This may be the strongest evidence that the market economy has taken hold in China and that economic reform has reached the point of no return.

However, the majority of China's SOEs are still not privatized, although every indication shows that the Chinese government intends to privatize most of its SOEs. Are there lessons that can be learned from the past 10 years, as China continues the path of economic reform? The answer is unequivocally yes. Several researchers have studied various aspects of share issues and stock markets in China (see [Chen, Firth, & Krishnan, 2001](#); [Chen, Kwok, & Rui, 2001](#); [Ma, 1996](#); [Sjoo & Zhang, 2000](#)), but one important aspect of the Chinese privatization program needs further examination—the state equity ownership in the newly privatized firms. For social, political, and economic reasons, the state retains equity ownership in most of the newly privatized firms (the range is from 0% to 88.5% in this study's sample). Two important questions arise. First, what is the effect of state equity ownership on performance of these newly privatized firms? Second, why does the government decide to hold more shares in some firms and less in others when privatizing its SOEs?

This research focuses on providing answers to these relevant and important questions. First, if policymakers have clear answers, they will be better equipped when making decisions regarding future privatization of SOEs. Second, because of the unique approach of the Chinese privatization program,<sup>4</sup> a better understanding of this type of privatization contributes to existing literature. Finance scholars who engage in privatization, ownership and performance, and transitional economy research will find this research particularly relevant.

This paper examines the relation between state equity ownership and firm market performance for China's newly privatized firms in 1994 (164 firms), 1995 (175 firms), and 1996 (252 firms). Two strands of literature are relevant to this study. On the one hand, agency cost theory ([Jensen & Meckling, 1976](#)) argues that shareholders are *not indis-*

<sup>2</sup> China's privatization program was first initiated in April 1984 through a State Commission for Restructuring the Economy proposal to allow workers to directly invest capital in collective and small-size SOEs, and to receive dividends (see [Ma, 1995, p. 161](#)). In July 1984 the Beijing Tianqiao Department Store was the first stock company established in Communist China. This experiment was extended to medium- and large-size SOEs in October 1984, and about 13,000 SOEs had been converted to stock companies by year-end 1993 (see [Ma, 1995](#)). The establishment of Shanghai and Shenzhen Securities Exchanges in 1990 and 1991, respectively, has institutionalized the government's effort and commitment to reform its vast SOE system through privatization. [Table 1](#) presents some summary statistics of firms listed in China's main exchange, the Shanghai Stock Exchange, from 1994 to 1996.

<sup>3</sup> Source: [China Security Market Yearbook \(1999\)](#).

<sup>4</sup> The Chinese government took the gradualism approach to privatizing its SOEs, as oppose to the Big Bang approach (privatize all firms at once) by Russia and other Eastern European countries. China first privatized a few firms in the early 1990s to gain experience and then gradually expanded the program to about 1000 firms by the end of 1998.

*tinguishable* and that firm performance depends on the distribution of share ownership among managers and other outside owners. It views managers as agents that can reduce the payoffs to a firm's outside owners by acting in their self-interest, and suggests that aligning the interests of insiders with that of the outside owners via equity ownership increases the firm's value.

Empirical research on agency cost theory with respect to ownership and performance has found at best weak support. For example, Demsetz and Lehn (1985), Denis and Denis (1994), and Holderness and Sheehan (1988) find no relation between managerial stockholders and firm performance. In contrast, McConnell and Servaes (1990) and Morck, Shleifer, and Vishny (1988) find a weak relation between ownership and performance, explaining between 2% and 3% of the cross-sectional variation in performance. More recently, Loderer and Martin (1997) find, using a framework of simultaneous equations, that higher managerial ownership does not lead to higher firm performance. However, better firm performance can lead to higher managerial stock ownership. Barnhart and Rosenstein (1998) find that board composition, managerial ownership, and Tobin's  $Q$  are jointly determined.

This study also investigates the relation between one type of equity ownership and firm performance, although the type of equity ownership is not managerial, but state.<sup>5</sup> This leads to the second strand of literature—property rights theory (Alchian, 1961; Alchian & Demsetz, 1972; Alchian & Kessel, 1962; Williamson, 1969, 1970). Property rights theory examines the relation between government and private ownership and their effect on firm performance.<sup>6</sup> It suggests that the one reason that firms with private ownership outperform those with government ownership is the nontransferability of government ownership.<sup>7</sup>

The involvement of state ownership in this study's sample can detrimentally impact performance because of well-known arguments in property rights theory, although in contrast the state holding of transferable equity can favorably impact performance (reduce agent cost) because of well-known arguments in agency theory. The uniqueness of this study is that the equity ownership type under investigation is state equity ownership, as opposed to many previous studies where equity ownership under investigation is managerial, and that the state ownership in this study is transferable equity ownership,<sup>8</sup> as opposed to many previous studies where state ownership is nontransferable or there is simply no market for ownership (e.g., Boardman & Vining, 1989; Kim, 1981; McGire & van Cott, 1984).

Performance measures used by previous researchers to compare state ownership versus private ownership are mostly accounting-based, such as return on sales (ROS), return on

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<sup>5</sup> In all of the newly privatized firms, managerial ownership is minimal, ranging from zero to a few thousand shares, and there is no stock option available for managers or directors.

<sup>6</sup> Boardman and Vining (1989) give a comprehensive review on literature concerning firm performance of government versus private ownership.

<sup>7</sup> As De Alessi (1980) puts it, "The crucial difference between private and political [publicly owned] firms is that ownership in the latter effectively is nontransferable. Because this rules out specialization in their ownership, it inhibits the capitalization of future consequences into current transfer prices and reduces owners' incentives to monitor managerial behavior."

<sup>8</sup> The government can change its stake in a privatized firm, but normally does so in one direction—lowering it. It is rare for the government to buy back shares from the market to increase its stake in a privatized firm.

total assets (ROA), and return on equity (ROE), and operating efficiency measures like sales per employee or net income per employee. However, the most widely used measure in the equity and performance literature is Tobin's  $Q$ , although other measures are also used, such as stock abnormal returns related to different events (such as merger, acquisition, and hostile takeover). This study uses market-based measures, including Tobin's  $Q$  and monthly stock returns (MSR).<sup>9</sup>

The overall results of this study show that the newly privatized firm's market performance is negatively correlated with its level of state equity ownership. This result is consistent with Boardman and Vining (1989) in the sense that state ownership has a detrimental impact on firm performance, may it be in the form of equity holding or outright ownership.

This study also finds that the relation between state equity ownership and Tobin's  $Q$  is convex. One explanation is that at low state ownership, firm performance is high because of arguments in property rights theory, and at high state ownership, firm performance is also high because it can be that the state divests itself of better performing firms at a slower pace to protect its interests, including monetary interests.<sup>10</sup> It may also be that the government more closely monitors firms with high state shares. This possibility is consistent with Groves, Hong, McMillan, and Naughton (1995), who argue that SOEs going through a privatization process must be monitored. Their evidence further shows that Chinese bureaucratic superiors can provide reasonably effective monitoring during this transitional period. The convexity finding does not imply, in extreme cases, that a firm should either be wholly state-owned or wholly private-owned. The explanation entertained here is that the convexity finding is a unique phenomenon during this transitional period and a result of the convergence of the aforementioned two strands of literature. The finding is also consistent with McConnell and Servaes (1990), but in an inverse sense.<sup>11</sup>

Furthermore, the empirical results show that firm's market performance is not an important determinant for state equity ownership. Instead, firm size and its strategic industry status are the main determinants of the state's equity ownership in China's newly privatized firms. The findings of this study have one main implication. State equity ownership is detrimental to firm performance. Ownership in a corporation comes with rights and obligations and monetary, profit-driven incentives to monitor the managers' decision making. However, because state equity ownership is so loosely defined, no individual representing the state ownership has real incentives to make sure that firm value

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<sup>9</sup> In many of the previous studies concerning equity ownership and performance (e.g., Barnhart & Rosenstein, 1998; Loderer & Martin, 1997, among others), daily stock returns are used. However, in this study's database, only monthly stock prices are available.

<sup>10</sup> In practice, the transferability of state ownership allows the state to maximize its interest (monetary or otherwise) by altering its stake in the newly privatized firms, even though this may present a real dilemma. Although the state's goal is to divest its stake in the newly privatized firms, it also has to protect its monetary and other interests, such as social stability. If the state lowers its stake in high-performance firms to achieve its goal of privatization, it may suffer via a lower claim to corporate profits (although this loss may be offset by higher corporate taxes).

<sup>11</sup> McConnell and Servaes (1990) find a concave relation between managerial ownership and Tobin's  $Q$ .

is maximized. It may be suggested that state shares represent political ownership stakes with the state's main interest more political than monetary. The source of the negative effect of state shares on firm performance may come from the divergence of the political interests of the government combined with the profit motivation inherent in a typical corporation.

The rest of the paper is organized as follows. Section 2 discusses corporate governance in China, whereas Section 3 describes the sample and data. Section 4 presents the methodology and hypothesis, and Section 5 the empirical results. Section 6 provides the conclusions.

## 2. Corporate governance in China

The bulk of the existing literature concerning equity ownership and firm performance involves firms in developed countries, such as the United States and Canada, where corporate governance is well established and mature. What is the case in China? This is a valid and important question that needs to be addressed, especially in the context of ownership and performance research.

Though it has been over 10 years since stock exchanges were established in China, corporate governance is still in its infant stage, compared to that in the United States and other developed countries. Not until 1993 and 1999 were China's first national company and securities laws enacted. Promulgated by the company law, the securities law and company bylaws (articles of association) of the privatized firms, corporate governance in China has many characteristics similar to those of developed countries, such as the United States. For instance, shareholders have similar rights, including voting rights to elect directors and to participate in important corporate decision making, the right to dividends, residual rights, and preemptive rights.

However, there are also many distinct features in China's corporate governance. For example, every limited liability company by law must set up a supervisory committee to supervise and monitor the activities of managers and directors. Two-thirds of the members of the committee must be elected by shareholders at annual meetings and one-third elected by employees of the firm. One main consideration of setting up the committee is to let employees of the firm voice their concerns so that social instability can be kept to a minimum.<sup>12</sup>

Stock ownership and stock options have been an important part of managerial compensation packages among firms in the United States and other developed countries. That is not the case among China's newly privatized firms, where managerial equity ownership is minimal and there is no stock option available. However, [Groves et al. \(1995\)](#) find that managerial compensation in China is closely linked to the firm's sales and profitability, and that China has developed a managerial labor market that incorporates many of the incentives in Western labor markets, albeit in different forms. Managers can be fired (and are fired) for poor performance, but the managerial labor market is still

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<sup>12</sup> Independent workers' unions, like those in the United States, do not exist in China.

inefficient, mainly because of the lingering political influence and limited managerial talent pool (China just started its own MBA programs a few years ago).

The corporate takeover market is also becoming more active in China. For example, Tsingtao Brewery, the largest beer producer and exporter in China, has successfully acquired more than 50 smaller beer breweries since 1995. Mergers are also frequent occurrences in China, but hostile takeovers are rare. In broad terms, managers and directors are said to owe shareholders a “fiduciary duty,” but the fiduciary concept is not well defined. Insider trading is explicitly forbidden by law, but the lack of maturity of the Chinese capital markets and inexperience of law enforcement personnel, among other factors, make the Chinese securities markets susceptible to manipulation, including insider trading.

The requirements for disclosure of material information about the firm are stringent in the United States. Press releases and conference calls with analysts are held regularly by U.S. firms, in addition to financial statement releases and filings with the SEC and the stock exchanges. In China, companies are also legally required to disclose any materially important information about the firm, but in practice, except for semiannual and annual reports sent to shareholders, there are no regular press releases and conference calls with analysts by Chinese firms.

Common shares in China are classified into four main categories, namely, the state shares, legal person shares, foreign shares, and individual shares. State shares in principle are owned by all people of the People’s Republic of China (PRC). These are retained by the state after privatization and managed by the State Assets Management Bureau (SAMB) on behalf of the people. The SAMB is set up to manage state assets, including equity ownership in newly privatized firms. It can nominate directors to the general shareholders meeting, but is not directly involved in the day-to-day management of the firm. State shares carry the same rights and obligations as other ordinary shares.

Legal person shares refer, strictly speaking, to shares owned by domestic institutions that enjoy legal status, such as banks, insurance companies, mutual funds, or other economic entities. Though many of these entities may still be state-owned or partially state-owned, institution shares and state shares are still different. It is plausible to argue that managers of these institutions have greater incentives to monitor the performance of the shares they hold. If their monitoring fails, they can always sell the shares. That is not the case for state shares. Managers of the privatized firm do not have the authority to increase or decrease the state ownership in the firm they manage.

Foreign shares are shares owned by non-PRC individuals or institutions, and individual shares refer to shares owned by individual PRC residents. Based on the currency denomination and residency requirements, shares in China can further be classified as A shares, B shares, and H shares. The A shares are also called “domestic shares” and can be subscribed and traded only in RY. These include state shares, legal person shares, and domestic individual shares. The B shares are shares listed on Chinese domestic stock exchanges, but subscribed for and traded in U.S. dollars (US\$). Prior to February 2001, only non-PRC residents were allowed to trade B shares.<sup>13</sup> The H shares are shares listed in

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<sup>13</sup> Beginning in February 2001, Chinese residents for the first time were allowed to trade B shares. Since then, the B share market has increased by more than 50%.

the Hong Kong Stock Exchange by Chinese firms and subscribed for and traded in Hong Kong dollars (HK\$).

### 3. Sample and data

The final sample, with summary statistics shown in Table 1, consists of 164 out of the 171 firms listed on the Shanghai Stock Exchange in 1994, 175 out of 188 in 1995, and 252 out of 293 in 1996. The discarded firms are those for which the stock did not begin trading until the second half of the year, because MSR is one of the dependent variables. The majority of firms listed only A shares, with a smaller number of firms listing both A and B, or A and H shares, and no firm listing both B and H shares. Firms in strategic industries totaled 31 in 1994, 33 in 1995, and 57 in 1996, with these in the energy (17 firms), iron and steel (31 firms), machinery (38 firms), communications (8 firms), and oil refinery and petroleum chemical (27 firms) industries.

The accounting data are obtained from annual reports of the sample firms from the *Shanghai Securities Yearbook (1995–1997)* and *Annual reports of listed companies*

Table 1  
Summary statistics of firms listed in Shanghai Stock Exchange 1994–1996 and the sample firms 1994–1996

Shanghai Stock Exchange listed firms and sample firms	1994	1995	1996	Total
<i>Shanghai Stock Exchange</i>				
Total listed firms (year-end)	171	188	293	652
Total capitalization (billion yuan)	41.73	49.83	74.06	165.62
Total market value (billion yuan)	260.00	252.57	547.78	1060.35
Total listed firms with A shares (year-end)	169	184	287	640
Total listed firms with A and B shares (year-end)	34	36	42	112
Total listed firms with A and H shares (year-end)	5	7	8	20
<i>Final sample</i>				
Total listed firms (6 months minimum trading)	164	175	252	591
Total listed firms with A and B shares in final sample <sup>a</sup>	34	36	42	112
Total listed firms with A and H shares in final sample <sup>a</sup>	5	7	8	20
Total listed firms in strategic industries in final sample	31	33	57	121
Energy	4	5	8	17
Iron and steel	9	9	13	31
Machinery	11	11	16	38
Communication	2	2	4	8
Oil refinery and petroleum chemicals	5	6	16	27

Source: *Shanghai Securities Yearbook (1995–1997)*.

A shares are renminbi-denominated domestic shares. A shares are divided into state shares, legal person shares, and individual shares. State shares are transferable and held by government agencies and/or SOEs. Legal person shares are owned by the enterprises that issued the shares and are subject to certain transfer restrictions. Individual shares can be owned only by Chinese residents. B shares (listed on China's exchanges) and H shares (listed on the Hong Kong Stock Exchange) are renminbi-denominated shares that can be owned only by foreign investors (including investors from Hong Kong, Macau, and Taiwan). B and H shares are subscribed for and traded in US\$ and HK\$, respectively. Holders of A, B, and H shares have the same rights and liabilities except for the holders' resident status and subscription/trading currency restrictions discussed above.

<sup>a</sup> In the sample, no firm issued both B and H shares.

Table 2  
Selected descriptive statistics for sample firms 1994–1996

Variable	Mean			Median			Standard deviation		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
<i>N</i>	164	175	252	164	175	252	165	175	252
STATE (%)	35.48	33.56	31.28	40.48	35.87	34.05	27.38	26.83	26.2
INST (%)	21.73	24.41	12.73	13.48	14.87	6.38	23.18	24.74	15.08
SALES 10,000 yuan	66,510	79,234	72,634	31,940	33,364	30,439	104,543	143,230	131,585
TA 10,000 yuan	106,550	136,710	126,963	55,929	65,755	61,936	163,629	239,860	221,051
LEV (%)	34.15	39.97	49.04	38.96	41.11	44.65	67.57	20.71	74.2
EPS (yuan)	0.3497	0.2581	0.2192	0.3046	0.2353	0.2341	0.3157	0.2814	0.3052
ROA (%)	8.07	5.20	5.14	6.391	4.86	5.40	8.73	4.51	5.84
ROS (%)	16.49	15.35	11.97	11.63	7.89	8.67	14.28	36.29	30.44
<i>Q</i>	2.365	1.770	2.669	2.052	1.607	2.167	1.529	0.6913	1.600
MSR (%)	4.855	0.291	4.47	4.547	-0.091	3.27	4.368	2.52	13.66

*N*=number of firms in the sample; STATE=percentage of shares held by the state in newly privatized firms; INST=percentage of shares owned by domestic institutions, or legal entities, such as insurance companies, mutual funds, or banks; SALES=sales revenues in 10,000 yuan, the currency unit of China; TA=total assets in 10,000 yuan; LEV=total debt divided by total assets (%); EPS=earnings per share, yuan/share, net income divided by total number of common shares outstanding (including B or H shares, if applicable); ROA=return on assets, measured as net income divided by total assets (%); ROS=return on sales, measured as net income divided by sales revenues (%); *Q*=Tobin's *Q*, measured by dividing the sum of market value of equity, the book value of short-term debt, and the book value of long-term debt by the book value of assets; MSR=arithmetic average monthly stock return for firms with only A shares and weighted average monthly stock return for firms with both A and B or H shares. See Eq. (2) for computation method.

Source: Values in the table are calculated using data contained in *Shanghai Securities Yearbook* (1995–1997), *Shanghai Securities Daily* (1994–1996), and the IMF's *International Financial Statistics* (1997).

1996–1997 and an analysis of Shanghai Stock Market (Lu, 1997).<sup>14</sup> The data include the year-end number of common shares outstanding and ownership structure of all listed firms. The *Yearbook* also provides the end-of-month stock prices in RY for A shares and US\$ for B shares, while the prices in HK\$ for H shares are obtained from the *Shanghai Securities Daily* (equivalent to the *Wall Street Journal*). The US\$/RY and RY/HK\$ exchange rates are obtained from the IMF's *International Financial Statistics* (1997). The standard accounting ratios ROS and ROA are calculated from the accounting data obtained in the annual reports. The technique used to calculate Tobin's *Q* is the same as in Loderer and Martin (1997), where the sum of the market value of

<sup>14</sup> Although differences still exist in accounting practices between China and the Western countries, these decreased with China's July 1993 adoption of the *Accounting Standards for Business Enterprises*, as described by Davidson, Alexander, Gelardi, and Li (1996). The *Standards* embody principles largely consistent with internationally accepted practices, as described by the World Bank (1996, p. 57). The World Bank reported that 96% of surveyed firms in China had "fully implemented" the new standards, and 84% had their accounts independently audited since 1990. Municipalities and provinces require CPA audits for all large SOEs and firms seeking listing on a stock exchange. Firms hire from among the "Big Six" accounting firms to have their financial statements prepared and audited according to international standards to gain credibility in the world markets (see Mills & Cao, 1996; Sender, 1992). Since 1992, seven international accounting firms, including all "Big Six" firms, have been allowed to open offices in China (Sinha, 1995).



equity, book value of long-term debt, and book value of short-term debt is divided by the book value of assets.<sup>15</sup>

Table 2 provides descriptive statistics for the sample firms’ variables for each year in the period 1994–1996. Most prominent is the higher means relative to the medians for sales revenues (SALES), total assets (TA), and institutional ownership (INST), representative of skewness in these variables. Throughout, ROA is less than the ROS, representative of asset turnovers that are less than one on the average for the sample firms. The mean for Tobin’s  $Q$  ranges from 1.607 to 2.669 and for MSR<sup>16</sup> from  $-0.091\%$  to  $4.855\%$ .

#### 4. Methodology and hypothesis

##### 4.1. State equity ownership and firm performance

To investigate the impact of state equity ownership on firm performance, a standard approach is followed of performing annual cross section and pooled cross section time-series regressions (for 1994, 1995, and 1996) using ordinary least squares (OLS). The firm’s performance is the dependent variable, with separate regressions for each performance measure, i.e., regression (1) for Tobin’s  $Q$  and regression (2) for MSR. The generic regression for these is shown below, with the expected signs above the coefficients of the independent variables, such that<sup>17</sup>

$$\begin{aligned}
 Q \text{ (or MSR)} = & \overset{-}{\beta_0} + \overset{+/-}{\beta_1}\text{STATE} + \overset{+}{\beta_2}\text{STATE}^2 + \overset{+}{\beta_3}\text{INST} \\
 & + \overset{+/-}{\beta_4}\text{LTA (or } \overset{+/-}{\beta_4}\text{LSALES)} + \overset{?}{\beta_5}\text{LEV} + \overset{+}{\beta_6}\text{EPS} \\
 & + \overset{+}{\beta_7}\text{STDEV} + \overset{+}{\beta_8}\text{BHSH} + \text{error}_{1 \text{ or } 2}
 \end{aligned}
 \tag{1 and 2}$$

<sup>15</sup> The market value of equity on a per share basis (MVE) is obtained as follows:

$$\text{MVE} = P_{\text{BH}}\text{BHSH} + (1 - \text{BHSH})P_{\text{A}} \quad (\text{Note : No firm in the sample issued both B and H shares.})$$

where  $P_{\text{BH}}$  is the B share price in yuan or H share price in yuan (depending on the firm),  $P_{\text{A}}$  is the A share price in yuan, and BHSH is the proportion of B or H shares in a firm.

<sup>16</sup> The MSR is the market value weighted average of the MSRs for the categories of shares issued by that firm, and is obtained as follows:

$$\text{MSR} = W_{\text{A}}\text{MSR}_{\text{A}} + W_{\text{B or H}}\text{MSR}_{\text{B or H}} \quad (\text{Note : No firm in the sample issued both B and H shares.})$$

where  $W_{\text{A}}$  is the proportion of the firm’s total market value represented by A shares,  $W_{\text{B or H}}$  is the proportion of the firm’s total market value represented by B or H shares,  $\text{MSR}_{\text{A}}$  is the average monthly stock return for the A shares, and  $\text{MSR}_{\text{B or H}}$  is the average monthly stock return for the B or H shares issued by the firm.

<sup>17</sup> Loderer and Martin (1997) estimate similar quadratic equations with  $Q$  and CAR (cumulative abnormal return) as the dependent variables, whereas McConnell and Servaes (1990) find that  $Q$  is a quadratic function of managerial ownership. Kim (1981) and Boardman and Vining (1989) also estimate OLS equations with accounting performance (such as return on sales and return on assets) and operating efficiency (such as sales per employee) as dependent variables.

where STATE is the fraction of the common shares held by the state in the sample firms; STATE<sup>2</sup> is the square of the STATE variable; INST is the percentage of shares owned by domestic institutions or legal entities, such as insurance companies, mutual funds, banks, or other firms; LTA and LSALES are the natural logarithms of total assets and sales; LEV is the total debt divided by total assets; EPS is earnings per share; STDEV is the standard deviation of the MSR; and BSHS is a B or H share dummy variable with a value of one if a firm issues B or H shares and zero otherwise.<sup>18</sup>

The major hypothesis in the performance regression equations [Eqs. (1) and (2)] is that the coefficient for STATE is negative. In this case, a higher value for STATE (more state ownership interest) is related to worse performance based on arguments from property rights and agency theory.<sup>19</sup> In addition, the coefficient for the variable STATE<sup>2</sup> in combination with the coefficient for STATE can be used to determine whether the relation between performance and STATE is convex (negative  $\beta_1$  and positive  $\beta_2$ ).<sup>20</sup> In this case, a higher value for STATE is initially related to worse performance, as mentioned above, except that beyond the inflection point performance improves. Better performance after the inflection point may reflect the government's retention of substantial ownership in better firms to protect its monetary interests.

A positive coefficient for INST is expected as greater institutional ownership interest is expected to reduce agency costs due to monitoring. The sign for LTA or LSALES is uncertain, and depends on whether agency costs or economies of scale prevail in the relationship between size and performance. A negative coefficient suggests that bigger firms in China tend to have higher agency costs and are less flexible in reacting to changing market conditions. A positive coefficient suggests that bigger firms in China tend to have economies of scale. Boycko, Schleifer, and Vishny (1996) argue that underperformance by SOEs is to a large extent due to overemployment. In this context, the unique population problem and socialistic nature of the economy suggests that overemployment is more severe in China, favoring the agency costs view of the relationship between size and performance.

The coefficient for LEV is uncertain, as agency theory models the firm's capital structure decision as a tradeoff between agency costs of equity and agency costs of debt, and there is no empirical evidence regarding China that might point to a particular direction. Positive coefficients for EPS and STDEV are expected because better performance (in terms of payoffs) is expected for higher risk and associated with higher earnings per share. Finally, a positive coefficient for BSHS is expected, as firms that issue B or H shares may be better performing firms, owing to their access to international capital and the associated pressure from international investors for performance. International capital

<sup>18</sup> Most studies dealing with equity ownership structure and performance, as in the present study, use market-based measures, such as Tobin's  $Q$  and/or stock returns (for example, Barnhart & Rosenstein, 1998; Loderer & Martin, 1997; McConnell & Servaes, 1990). Those dealing strictly with public ownership and performance use accounting-based measures, such as ROS, ROA, and/or ROE (for example, Boardman & Vining, 1989; Kim, 1981). While not the focus of this study, regressions were also estimated for return on sales and assets performance measures, and their results are presented in footnote 26.

<sup>19</sup> High state ownership in the firm requires that the state hire agents to look after its interest, and result in lower performance as government agents act in their own rather than that of the state's best interest.

<sup>20</sup> Convexity is a characteristic of U-shaped or quadratic equations. The inflection point in regression (1), for example, can be computed by equating the partial derivative  $\partial Q/\partial \text{STATE}$  to zero, and then solving for STATE.

may also come with advanced managerial and technical expertise, leading to better performance.<sup>21</sup>

#### 4.2. Determinants of state equity ownership

To investigate the determinants of state equity ownership in the newly privatized firms, the OLS methodology is used over similar cross sections and time-series as above. Theoretical or empirical guidance in deciding on the regression's explanatory variables is lacking, but answers to the following three questions are of interest: (1) Does the state hold higher ownership in bigger firms? (2) Does the state hold higher ownership in firms in the strategic industries? (3) Does the state hold higher ownership in better performing firms? Regression (3) investigates under a single-equation setting the determinants of state share in light of these three questions. In this regression, STATE is the dependent variable,<sup>22</sup> such that

$$\begin{aligned} \text{STATE} = & \beta_0 + \overset{+}{\beta_1} \text{LTA} + \overset{+}{\beta_2} \text{SIDM} + \overset{+/-}{\beta_3} \text{Q} \text{ (or } \overset{+/-}{\beta_3} \text{MSR)} \\ & + \overset{+/-}{\beta_4} \text{QLTA} \text{ (or } \overset{+/-}{\beta_4} \text{MSRLTA)} + \text{error}_3 \end{aligned} \quad (3)$$

where SIDM is a strategic industry dummy representing energy (17 firms), iron and steel (31 firms), machinery (38 firms), communications (8 firms), and oil refinery and petroleum chemicals (27 firms), and equal to one if a firm belongs to one of these industries and zero otherwise. This dummy variable is included because a high government stake may be related to whether a firm is in a strategic industry, leading to an expected positive coefficient. This is consistent with China's overall reform characteristic—gradualism. Due to the near obsession of the Chinese government with social stability, it is plausible to argue that the government wants more control over firms in strategic industries to prevent potential social and political fallouts should the privatization go wrong.

Firm size (LTA) is believed to be an important factor affecting the government's decision on ownership interest in newly privatized firms, leading to the hypothesis that the coefficient of LTA is positive. First, the state holds higher ownership in bigger firms due to stability concern.<sup>23</sup> Firms with large assets tend to have high employment levels, and in privatizing these firms, the government may want to have more control over the hiring and laying-off of workers. Second, the state may maintain high stakes in big, good-performing firms to reap the financial rewards and protect its monetary interests. Finally, high government stakes in big firms may be a political compromise between the conservatives who do not want to see private ownership at all and the reformers who believe the market economy and private ownership are the only route to China's prosperity.

<sup>21</sup> Ma (1996) documents big discounts for B shares in the 1992–1994 period, but attributes these to regulatory risk concerns for international investors and speculation by domestic investors, rather than firm performance.

<sup>22</sup> It is acknowledged that other unquantifiable factors may also contribute to the state's ownership decision, such as social and political considerations.

<sup>23</sup> The slogan "Stability is paramount" appears in China's official media quite regularly.

The relation between STATE and Tobin's  $Q$  or MSR is an empirical question, if the main concern of the Chinese government is the successful privatization of its SOEs while protecting its monetary and/or social interests. In this case, there is hypothetically no reason to believe the government would change its shares because of higher or lower stock returns (MSR) or Tobin's  $Q$ , even though it may be a factor that the government considers. Also, to capture the potential interactions between performance and size, QLTA, the product of  $Q$  and LTA, and MSRLTA, the product of MSR and LTA, are included in regression (3).

## 5. Empirical results

Table 3 presents annual cross section and pooled cross section time-series results (for 1994, 1995, and 1996) for regression (1) using Tobin's  $Q$  as the dependent variable with two size measure specifications (LTA and LSALES). Throughout, no heteroscedasticity is detected for any of the OLS regression equations.

The coefficients for STATE under most cases (except 1995) are negative and highly significant, suggesting that higher state shares in China lead to lower firm values. The relation between Tobin's  $Q$  and STATE is also convex, as the coefficients for STATE<sup>2</sup> are positive and significant (except for 1996 with the LSALES size specification). As such,  $Q$  is lower when STATE is higher, except that beyond the inflection point,  $Q$  is higher when STATE is higher.<sup>24</sup> This finding is consistent with Boardman and Vining's (1989) finding that mixed enterprises underperform both private enterprises and wholly SOEs. Tobin's  $Q$  is also lower the bigger the firm, as the coefficients for LTA and LSALES are negative and significant. The bigger firms may have more agency problems, consistent with Loderer and Martin (1997).

The pooled results for INST are negative and significant, but in the cross sections INST is mostly significant but mixed, changing from positive to negative in 1996. The pooled results for LEV and EPS are both positive and significant and for BSHS, insignificant, although in the cross sections these results are mixed. The coefficients for STDEV are never significant. All Tobin's  $Q$  regressions are significant at 1% by the  $F$  statistic and the adjusted  $R^2$  are mostly in the 20% range.

Table 4 presents annual cross section and pooled cross section time-series results (for 1994, 1995, and 1996) for regression (2) using MSR as the dependent variable with two size measures specifications (LTA and LSALES). The coefficient for STATE is insignificant, such that STATE is not a determinant of stock returns. However, STDEV is positive and significant throughout. Unexpectedly, the pooled results for INST is negative and significant, but the cross sections are insignificant; whereas the pooled results for EPS are insignificant, but the cross sections are mostly positive and significant. Size in both LTA and LSALES is significantly positive throughout, except for 1994. Finally, the pooled

<sup>24</sup> The inflection points range from 18.6% to 37.6% with LTA-size specifications and 7.3% to 39.5% with LSALES-size specifications. With LTA as the size variable, there are 90, 112, 114, and 273 data points in  $Q$  past the inflection points for 1994, 1995, 1996, and the pooled data, respectively.

Table 3  
Results for regression (1) with Tobin's  $Q$  as dependent variable

Independent variables	Specification							
	1A				1B			
	1994	1995	1996	Pooled	1994	1995	1996	Pooled
Intercept	7.875	5.210	7.948	7.961	4.251	4.016	5.185	5.162
STATE	-4.634***	-0.777	-2.704***	-3.570***	-4.548***	-0.208	-2.146*	-3.146***
STATE <sup>2</sup>	6.741***	2.089**	3.725**	4.475***	6.172***	1.425*	2.730	3.979***
INST	0.869**	1.131***	-1.506**	-0.644**	0.673	1.190***	-1.671***	-0.713**
LTA	-0.569***	-0.360***	-0.492***	-0.509***				
LSALES					-0.223***	-0.267***	-0.256***	-0.267***
LEV	197*	0.0265	0.774***	0.569***	0.0371	-0.171	0.774***	0.501***
EPS	186	0.221	1.466***	0.581***	-0.003	0.320*	1.507***	0.591***
STDEV	.00876	.00473	.000778	.003	.0088	.0030	.0007	.003
BHSH	0.943***	0.292**	-0.313	0.132	0.514**	0.139	-0.653***	-0.190
$N$	164	175	252	591	164	175	252	591
Adjusted $R^2$	29.3%	22.1%	29.4%	17.4%	17.9%	22.7%	26.3%	13.3%
$F$ statistics	9.374	7.173	14.042	16.547	5.405	7.392	12.221	12.324
$P$ value	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
No. outlier	1	0	0	0	1	0	0	0

$$\text{Tobin's } Q = \beta_0 + \beta_1 \text{STATE} + \beta_2 \text{STATE}^2 + \beta_3 \text{INST} + \beta_4 \text{LTA (or } \beta_4 \text{LSALES)} + \beta_5 \text{LEV} + \beta_6 \text{EPS} + \beta_7 \text{STDEV} + \beta_8 \text{BHSH} + \text{error}_1$$

STATE=fraction of the common shares held by the state in the sample firms; STATE<sup>2</sup>=square of the STATE variable; INST=percentage of shares owned by domestic institutions or legal entities, such as insurance companies, mutual funds, banks, or other firms; LTA=natural logarithm of total assets; LSALES=natural logarithm of sales; LEV=total debt divided by total assets; EPS=earnings per share; STDEV=standard deviation of the MSR; BHSH=B or H share dummy variable with a value of one if a firm issues B or H shares and zero otherwise.

- \* Significant at the 10% level.
- \*\* Significant at the 5% level.
- \*\*\* Significant at the 1% level.

Table 4  
Results for regression (2) with MSR as dependent variable

Independent variables	Specification							
	2A				2B			
	1994	1995	1996	Pooled	1994	1995	1996	Pooled
Intercept	4.066	−12.853	−12.252	−8.376***	−0.0104	−7.994	−9.029	−4.243**
STATE	−4.322	3.718*	4.026	−0.309	−3.733	2.296	2.815	−0.939
STATE <sup>2</sup>	12.003***	−7.240***	−7.563	−2.954	11.276***	−5.164**	−5.842	−1.818
INST	2.004	−1.138	−2.722	−3.980***		−1.138	−2.577	−3.875***
LTA	−1.323***	1.040***	1.004***	0.759***				
LSALES					−0.966***	0.604***	0.767***	0.402**
LEV	0.700**	−2.228***	−0.310	0.051	0.303	−1.473**	−0.325	0.049
EPS	2.814***	−2.378***	2.720***	−0.253	2.850***	−2.392***	2.380***	−0.271
STDEV	.237***	.250***	.258***	.172***	.233***	.258***	.260***	.171***
BHSH	2.812***	−1.272***	−1.124	−0.918*	2.193***	−0.679*	−0.681	−0.442
N	164	175	252	591	164	175	252	591
Adjusted R <sup>2</sup> (%)	54.6	48.4	65.0	46.4	54.1	45.1	64.9	45.8
F statistics	25.543	21.406	58.957	64.677	25.035	18.873	58.797	63.119
P value	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
No. outlier	0	0	1	1	0	0	1	1

$$MSR = \beta_0 + \beta_1 STATE + \beta_2 STATE^2 + \beta_3 INST + \beta_4 LTA \text{ (or } \beta_4 LSALES) + \beta_5 LEV + \beta_6 EPS + \beta_7 STDEV + \beta_8 BHSH + \text{error}_2$$

STATE = fraction of the common shares held by the state in the sample firms; STATE<sup>2</sup> = square of the STATE variable; INST = percentage of shares owned by domestic institutions or legal entities, such as insurance companies, mutual funds, banks, or other firms; LTA = natural logarithm of total assets; LSALES = natural logarithm of sales; LEV = total debt divided by total assets; EPS = earnings per share; STDEV = standard deviation of the MSR; BHSH = B or H share dummy variable with a value of one if a firm issues B or H shares and zero otherwise.

\* Significant at the 10% level.

\*\* Significant at the 5% level.

\*\*\* Significant at the 1% level.

Table 5  
Results for regressions (3) with state as dependent variable

Independent variables	Specification							
	3A				3B			
	1994	1995	1996	Pooled	1994	1995	1996	Pooled
Intercept	- 1.010* *	- 0.288	- 0.611	- 0.727***	- 1.013***	- 0.358	- 0.469**	- 0.463***
LTA	0.123***	0.0572	0.0843**	0.0959***	0.118***	0.0593***	0.690***	0.0696***
SIDM	0.132**	0.120**	0.0979**	0.112***	0.138***	0.123**	0.0951**	0.114***
<i>Q</i>	0.244	- 0.0265	0.132	0.181 *				
QLTA	- 0.0231	0.0003	- 0.0133	- 0.0178 *				
MSR		-			0.118**	- 0.0571	0.0166	0.0199
MSRLTA					- 0.0101**	0.0051	- 0.0017	- 0.0020
<i>N</i>	164	175	252	591	164	175	252	591
Adjusted <i>R</i> <sup>2</sup>	11.4%	8.8%	6.8%	9.5%	13.8%	8.4%	6.9%	8.9%
<i>F</i> statistics	6.241	6.419	5.587	16.425	7.502	5.021	5.67	15.464
<i>P</i> value	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)

$$\text{STATE} = \beta_0 + \beta_1 \text{LTA} + \beta_2 \text{SIDM} + \beta_3 Q \text{ (or } \beta_3 \text{MSR)} + \beta_4 \text{QLTA (or } \beta_4 \text{MSRLTA)} + \text{error}_3$$

STATE=fraction of the common shares held by the state in the sample firms; LTA=natural logarithm of total assets; SIDM=strategic industry dummy representing energy, iron and steel, machinery, communications, and oil refinery and petroleum chemicals, and equal to one if a firm belongs to one of these industries and zero otherwise; *Q*=Tobin's *Q*; MSR=monthly stock returns; QLTA=product of *Q* and LTA; and MSRLTA=product of MSR and LTA.

- \* Significant at the 10% level.
- \*\* Significant at the 5% level.
- \*\*\* Significant at the 1% level.

results for LEV and BSHH are insignificant, and in the cross sections produce mixed results. All MSR regressions are significant at 1% by the  $F$  statistic and the adjusted  $R^2$  are mostly between 20% and 60%.<sup>25</sup>

Overall, Tobin's  $Q$  is convex with respect to STATE and negatively related to size (LTA or LSALES) as expected, whereas MSR is positively related to STD, as expected, and size. Apparently, newly privatized firms in China perform better with respect to the relation between their existing market and book values, and their increased size is paying off with respect to their stock returns. Variables BSHH and LEV produce mixed results throughout, and INST is negative and significant in the pooled results and otherwise mixed or insignificant. International ownership in the form of B or H shares and size has unpredictable effects on performance of newly privatized firms in China. Also, institutional ownership in China does not appear to result in improved performance, contrary to expectations. Most domestic institutional owners in China are still state-owned, and managers in these are still paid by the state. At present, it appears that they do not necessarily have the proper incentives to positively influence the firm's management.

Table 5 presents annual cross section and pooled cross section time-series results (for 1994, 1995, and 1996) for regression (3) using STATE as the dependent variable with two performance specifications ( $Q$  and MSR). The coefficients for firm size (LTA) and the strategic industry dummy (SIDM) are significantly positive in both specifications, suggesting that the larger the firm and the more strategic its industry, the greater the state's holdings. In contrast, the coefficients for Tobin's  $Q$  and stock return (MSR), including their interaction with size, are mostly insignificant, suggesting that the state's holdings do not change because of stock performance or profitability.

The results further show that the explanatory variables in regression (3) can explain only 6.8% to 13.8% of the cross-sectional variations in state's equity holdings (Table 5). It can be that other unquantifiable factors, such as social and political considerations, also play an important role in the state's equity ownership in the newly privatized firms. This is consistent with the argument that state equity ownership is not mainly profit-driven, but rather more politically motivated.

To test the robustness of our OLS results, a simultaneous analysis within a framework of structural equations was conducted. The results show no significant bidirectional causality between performance and state equity ownership in China's newly privatized firms.<sup>26</sup> This result to some extent validates the OLS methodology.

<sup>25</sup> The results using ROS and ROA performance measures as dependent variables show that the coefficient for STATE is significantly negative and STATE<sup>2</sup> significantly positive in the pooled results, especially for ROS, but cross-sectional results are mostly insignificant. Size, as measured by LTA and LSALES, is significantly negative for all pooled results and in 1996. LEV is significantly negative in the pooled results, but only significantly negative in the cross sections for ROA. EPS is positive and significant in all regressions, and STDEV is mostly insignificant. BSHH is positive and often significant with respect to ROS but not ROA. All but one of the regressions were significant at 1% by the  $F$  statistic, and the adjusted  $R^2$  were above 50% for ROA, and between 14% and 49% for all but one of the ROS regressions.

<sup>26</sup> The empirical results of the simultaneous analysis are available from the authors upon request.



## 6. Conclusions

The relation between state ownership and firm performance is investigated for China's newly privatized firms in 1994 (164 firms), 1995 (175 firms), and 1996 (252 firms). Two measures of firm performance are used, namely, Tobin's  $Q$  and MSR.

In a single equation setting, Tobin's  $Q$  is convex with respect to state ownership, as expected, and negatively related to size, whereas stock returns are positively related to the standard deviation, as expected, and size. It appears that newly privatized firms gained capital and higher market values, and that their increased size is paying off in terms of their stock returns. These results are robust as it is also found that firm performance is not an important determinant of state ownership. Rather, firm size and its strategic industry status are the main determinants of the state's equity ownership in China's newly privatized firms.

International ownership has an unpredictable effect on performance of newly privatized firms in China, and domestic institutional ownership does not appear to result in improved performance. Possibly, domestic institutional owners do not necessarily have the proper incentives to positively influence the firm's management in China as many are state-owned and managers in these paid by the state.

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