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# **Stock Liquidity and the Pricing of Earnings: A Comparison of China's Floating and Non-floating Shares**

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**Stock Liquidity and the Pricing of Earnings:  
A Comparison of China's Floating and Non-floating Shares**

**Abstract**

The reform to convert non-floating shares to floating in China provides a setting in which shares are subject to different liquidity constraint. We show that the severity of this constraint is inversely related to the extent to which earnings information is reflected in the share prices. Specifically, before the reform, the transfer prices of non-floating shares reflect much less earnings information than the market prices of floating shares. After the reform, however, both types of transfer reflect more earnings information, although the weights are still less than that found in the market prices. Thus, China's unique setting shows that share liquidity affects the way earnings are priced in stock.

Keywords: Stock Liquidity; Pricing; Earnings; China

JEL Classification: G12; G15; G32; M41

## **Stock Liquidity and the Pricing of Earnings: A Comparison of China's Floating and Non-floating Shares**

### **I. Introduction**

This study compares the pricing mechanisms of two classes of stock in China: floating shares that are exchanged on the stock market and non-floating shares that can only be transferred between government agencies or corporations. This split share structure system is one of the unique features of China's fledgling stock market. Non-floating shares have exactly the same voting and cash flow rights as floating shares, but can only be transferred between government agencies or corporations through private negotiation. Silber (1991) documents significant price differences between restricted securities which can be sold only after a two-year holding period and publicly traded securities of the same company in the US. Thus we expect China's floating and non-floating shares to have different pricing mechanisms and very different price levels since they have very different trading liquidity.

We examine how earnings information is incorporated in the prices of different types of stock in China. Non-floating shares in China are classified into "state shares" and "legal-person shares." State shares are held by a government agency or a state-owned enterprise (SOE), and their transfer requires governmental approval as well as regulations on the level of transfer prices. Legal-person (LP) shares, on the other hand, are held by township and village enterprises, privately-owned enterprises, and foreign companies, and their transfer does not require government approval or price regulations. Together with the market prices of floating shares observed from the stock exchanges, this setting allows us to identify transactions that are subject to three distinct levels of liquidity. On one extreme is the transfer of state shares that is subject to state approval and regulations on prices. Lying in the middle is the transfer of legal-person shares

between private entities, which is free from government intervention but subject to severe illiquidity. On the other extreme is the trading of floating shares in the open market that is least constrained by illiquidity.

The distinction of liquidity has reduced significantly after a reform to convert non-floating shares to floating initiated by the Chinese government in 2005. The split share structure reform makes both the state shares and LP shares floating within one to three years, depending on the percentage owned by their shareholders. In addition, the transfer of state shares is no longer subject to governmental approval. Thus, within three years after the reform, the transfers of state shares and LP shares are still subject to certain sale restrictions. The liquidity difference between state and LP shares and the original floating shares is lower but still exists after the reform. Thus, by comparing different price mechanisms before and after the reform under different levels of trading restrictions and illiquidity constraints, we shed light on the impact of stock liquidity on the pricing of earnings in China's stock market.

The market prices that are observed from China's stock market provide an interesting benchmark to compare the ability of the transfer prices to reflect individual firm's fundamentals because stock prices in China continue to exhibit the highest synchronicity among the markets around the world (Morck *et al.* 2000 and Durnev *et al.* 2004). Durnev *et al.* (2004) take this as evidence that reforms in China have been least effective at creating functionally efficient stock markets. Other studies show that when stock prices are more synchronous, they are less likely to reflect information about future earnings (Durnev *et al.* 2003). Thus, China's stock market is expected to be "poor" in its ability to impound earnings information, and the market prices provide a very low benchmark for assessing transfer prices. It remains an empirical question that

whether they can better reflect the earnings information than the transfer prices of illiquid non-floating shares.

Using a sample of 1,501 share transfers in China's stock markets in Shanghai and Shenzhen from 1998 to 2008, we show that despite the immaturity of China's stock market, the market prices generally reflect part of past or future earnings information. However, before the reform, the transfer prices of non-floating state shares are based primarily on the book value of net assets without considering earnings and the quality of assets. Earnings are priced only in the transfers of LP shares, which are not constrained by state regulation and control. However, due to the illiquidity of shares, the weight of earnings in valuation is much less in transfer prices than in the market prices of floating shares. In comparison, after the reform, the transfer prices of both state shares and LP shares incorporate book value and earnings information because there are no more governmental approval and price regulations on state shares. However, due to the holding period restriction of state and LP shares, the weight of earnings in valuations is still less in transfer prices than in the market prices of original floating shares. In summary, the Chinese setting provides evidence that government involvement and market forces play opposite roles in generating a price that can reflect earnings information.

Although the issues of China's non-floating shares that are studied in this paper are quite distinct, they are related to previous research. Silber (1991) examines the extent of illiquidity discount of restricted shares that can be sold only after a two-year period. The study shows that the discount varies directly with the number of restricted shares related to that of publicly traded shares and inversely with the credit-worthiness of the issuing firm. Even credit-worthy firms need to offer price discount of more than 30 percent to sell a significant block of restricted shares. Longstaff (1995) uses an analytical model to show that the illiquidity discount is a

function of the duration of the sale restriction and the variation in the prices of unrestricted shares. Using price data of restricted shares in China, Chen and Xiong (2002) show that the illiquidity discount increases with the firm's debt-to-equity ratio and its floating shares' volatility, and decreases with firm size, return on equity and the floating shares' book-to-market ratio. For a sample of U.S. biotechnology companies, Hand (2005) finds that the degrees and signs of the association between financial statement data and equity value are similar in open stock markets and private venture capital markets. However, Hand does not compare the relative importance of earnings and book value in public and private markets. In addition, the venture capital market is very different from China's non-floating stock market, as the shares that are exchanged in the venture market are much closer to being floating on the open market than China's non-floating shares. Our setting of China's non-floating shares is useful to further understand the impact of illiquidity on the pricing mechanism of shares.

Our findings have important implications related to two fundamental functions of a stock market: to motivate managers to create value for shareholders and to discipline poor performance through a takeover mechanism. If the transfer prices of non-floating shares do not reflect earnings information, the holders of these shares do not benefit directly from an improvement in corporate performance, and there are no clear incentives to create value for other shareholders. In addition, the takeover market cannot function properly, as the potential acquirer cannot realize the improved future profit stream by selling the shares through private transfer in the future. Our findings indicate that market forces are necessary for the share prices, whether observed from stock exchanges or private transfers, to reflect earnings information. The government involvement, including direct or indirect shareholdings and approval process, causes stock illiquidity and hence is detrimental in the ability of prices to impound earnings information.

The rest of this paper is organized as follows. The next section describes the regulation and practice of the transfer of state and legal-person shares in China. Section 3 discusses the hypotheses, Section 4 presents the empirical results, and Section 5 concludes the paper.

## **2. Regulation and practice of the transfer of non-floating shares**

### *2.1. China's split share structure*

In the late 1980s and early 1990s, many of China's state-owned enterprises (SOEs) were converted to stock companies as part of the country's transformation from a planned economy to a mixed economy. In the beginning, all SOE shares were state-owned shares (referred to hereafter as state shares for simplicity). Then, to raise more capital, many SOEs were allowed to issue additional shares to "legal persons," including township and village enterprises, privately-owned enterprises, and foreign companies. Before a company is listed, the equity of state and legal person shareholders (refer to as LP shareholders) is converted into shares of the listed company based on the reappraised value of the net assets.

When the Shanghai and Shenzhen stock exchanges opened in 1992, the government insisted on having majority control of most listed companies. To ensure this, the original state and LP shares were designated as non-floating so that they could not fall into the hands of private individuals. Only shares that are sold to the public through IPOs or right issues are floating. Thus, the split share structure, in which there are two separate classes of stock (floating vs. non-floating), was in place from the beginning of China's stock market. The non-floating shares are either held by the state or legal persons. The floating shares consist of "A-shares" that are traded by domestic investors in Shanghai or Shenzhen Stock Exchanges, "B-shares" that are traded by foreign investors in the same two exchanges, and "H-shares" that are traded in Hong Kong's stock market.



Figure 1 shows the breakdown of the various types of shares. It is seen that the state remains the largest shareholder of listed companies (from an average of 41% in 1998 to 22% in 2008). In addition, the shares of legal persons are also significant, as together the state and legal persons control more than 50% of all shares issued on average, and these shares are not floating. The floating A-shares, B-shares, and H-shares account for less than 50% of total shares.

[Insert Figure 1 here]

The split structure of non-floating and floating shares has led to at least two serious problems. First, because the supply of floating shares is limited, their prices are highly inflated. Most of shares initially offered are oversubscribed several hundred times.<sup>1</sup> The high demand for shares is also reflected in the unreasonably high P/E ratios, which averaged 34.18 in 1998, gradually climbed to 58.21 in 2000, and leveled off to the mid-30's afterwards. The second problem is that the stock prices do not serve the function of rewarding good and disciplining poor performance. When a firm performs well, the controlling shareholders, who typically own non-floating shares, cannot benefit by selling their shareholdings to the public market. When the firm performs poorly, potential acquirers cannot take over the company by open market purchases, because the majority of shares are in the hands of the state and legal persons. This conflict of interest between non-tradable shareholders and tradable shareholders results in serious agency problems (Huang and Fung 2005) and the problem is proved to be eased after the conversion of non-floating shares to floating shares (Tseng 2012).

## *2.2 Conversion of non-floating shares*

Chinese government has for several years been attempting to resolve the issues that were caused by the split share structure. After almost three years' deliberation and consultation, the China Securities Regulatory Commission (CSRC) issued a guideline in April 2005 to reform the

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<sup>1</sup> The subscription ratio of IPOs was more than 200 in 1998 and 1999, and more than 300 in 2000 and 2001.

split share structure by converting the non-floating shares into floating. The reform guideline allows non-floating and floating shareholders to decide between themselves the acceptable compensation that the former group has to pay to the latter to convert non-floating shares into floating (Firth *et al.* 2010, Chen *et al.* 2011, Li *et al.* 2011 and among others). As shown in Figure 1, the ownership percentage of state and LP shares dilutes significantly since 2005 because state and LP shareholders have to offer some shares to existing floating shareholders as a compensation for the conversion of non-floating shares into floating. As of the end of 2006, all but 40 of the 1,341 listed companies have completed the conversion process.

It is reasonable to assume that, before the split share structure reform, neither party in the transfer of non-floating shares would anticipate the conversion of non-floating shares in the foreseeable future. Therefore, there is a clear distinction in the non-floating stock liquidity before and after the split share structure reform. However, the new CSRC guideline has not brought about the immediate conversion of most non-floating shares, because the guideline stipulates that once the non-floating shares of a company have been approved to become floating by shareholders, the holders of those shares must pledge not to sell them for at least 12 months. They must also pledge that after the initial 12-month period, they will not sell more than 10% of their shares in the next 24 months.<sup>2</sup> Thus, even after the initiation of the non-floating share reform in April 2005, the full floating of the non-floating shares is still many years away.

### *2.3 Regulation and reporting requirements for share transfers*

The transfer of state shares (owned by government agencies and SOEs) and the transfer of LP shares (owned by private entities, including township and village enterprises, privately-

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<sup>2</sup> These lockup restrictions are expected to have different impact on liquidity of shares. For example, shares with a lock up period of 3 years are less liquid than those with a lock up period of only 1 year left. However, we are not able to collect such data and hence it will be a limitation of this study. We thank one of the anonymous reviewers for pointing out this.

owned enterprises, and foreign companies) are governed by different agencies and rules. The State Assets Management Bureau (SAMB, an agency under the Ministry of Finance) or its provincial branches exercise the control rights over state shares.<sup>3</sup> According to several rules on the transfer of non-floating shares, state shares can be transferred to other government agencies, legal entities, and foreign investment firms.<sup>4</sup> The transfer is subject to the approval of the SAMB or its provincial branches. The transfer price should be based on firm fundamentals such as net book value per share, return on equity (ROE), return on investment (ROI), recent market price, and a reasonable price-to-earnings ratio. In addition, the price must be higher than the net book value per share to protect the state's interests.<sup>5</sup> The system for the transfer of LP shares is much less restrictive. Governmental approval is not needed. In addition, there are no specific rules governing the pricing of LP shares. Thus, the pricing mechanisms of state and LP shares are not the same, and will be analyzed separately.

The disclosure of the transfer of both state and LP shares is regulated by the *Securities Law* that was enacted in 1998, and a CSRC ordinance that was issued in 2002. If the shares transferred account for more than 5% of total shares, then the transfer has to be disclosed in a newspaper that is authorized by the CSRC within three days of transfer. In practice, some companies voluntarily disclose the transactions even when the transfer ratio is less than the 5% threshold. The disclosure generally includes the name of the company whose shares are being transferred, the names and brief description of both parties, whether they are related parties, whether there is a change in the nature of shares, the transfer price, the number of shares being

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<sup>3</sup> The SAMB was elevated to ministerial level in 2003 as the State-owned Assets Supervision and Administration Commission (SASAC).

<sup>4</sup> These include *Notice on the Problems of Offering and Transferring State Shares* and *Opinions on the Exercise of the Shareholder Rights by the State Shareholders* issued by the SAMB in 1994 and 1997, respectively. Starting from November 2002, foreign entities are allowed to buy non-floating shares.

<sup>5</sup> A regulation that was issued in 1997 also loosened the state's control of listed companies; the state no longer needs to hold a majority of shares after the transfer. This rule allows the government to phase out its ownership of industries that are not monopolistic.

transferred, the percentage of shares transferred of the total shares outstanding, and the top ten shareholders before and after the transfer. The disclosure on the change in the nature of shares allows us to identify whether a government entity is involved in the transfer, since it reveals the official classification of the shares.

#### *2.4 Description of transfer price data*

We obtain the sample and all relevant data from *CSMAR*, a database of China's listed companies. The database includes all announcements of share transfers made according to statutory requirements as described in the previous subsection. There are 1,501 cases of completed transfer with relevant transfer price and financial data information included in the *CSMAR* database from 1998 to 2008. Panel A of Table 1 shows the sample distribution in frequency, percentage of shares transferred and transfer price by year. The majority of share transfers happened during the six-year period from 2001 to 2006. There is a significant drop of share transfers in 2007 and 2008 because the majority of firms already finished the split share structure reform and hence they were reluctant to do private transfer in anticipation of public trading after the reform. There are very few private transfers after 2008 since the CSRC ordered shareholders to sell stocks on exchanges' block trading system if they expect to sell a large amount of shares freed from the lock-in period. The percentage of shares transferred ranges from 11.44% in 2007 to 20.55% in 2000, with an average of 13.30% during the sample period. The average transfer price is about 2.51 Chinese Renminbi. Of the 1,501 share transfers, 1,143 incurred before the split share structure reform (abbreviated as SSSR in all the tables) and 358 ones incurred after the reform. Untabulated statistics show that the percentage of shares transferred after the reform is significantly lower than that before the reform (the Wilcoxon z-score is 3.60 with a significance level of 1%). It also reports that among the 1,501 transactions,

629 are transfers of state shares. They are sold by government agencies or SOEs and subject to the approval of the SAMB. They are in contrast to the 872 transfers of LP shares that were sold by legal persons. Untabulated statistics show that transfers of state shares involving government entities tend to account for larger percentage of total shares (the Wilcoxon z-score is 12.60 with a significance level of 1%).

Panel B of Table 1 further shows that there are a total of 577 unique firms which are involved in share transfers in the 11-year period. Majority of the sample firms (353 out of 577) engaged in one or two transactions each in the sample period (213 firms with one transaction each and 140 firms with two transactions each). The remaining 224 sample firms engaged in three or more share transfers each.

[Insert Table 1 here]

Table 2 shows the median statistics of the transfer and market prices, together with the price-multiples and ROEs. The market price (MP) is the A-share stock price on the day the transfer agreement is reached as stated in the announcements. In measuring the price-to-book (P/B) ratio, the book value of equity on the most recent balance-sheet date is used. In measuring the price-to-earnings (P/E) ratio, either most recent annual earnings or two most recent semiannual earnings are used.<sup>6</sup> Panel A of Table 2 shows that, for the whole sample, the median ratio of MP to TP is 3.87. Thus the transfer prices are only a fraction of the market prices, which is consistent with the findings in Chen and Xiong (2002). The median P/B ratio based on transfer

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<sup>6</sup> Chinese companies reported their financial results semiannually before the first quarter of 2002 and quarterly thereafter. The annual report is due at the end of April (all firms use calendar year) and the semiannual report at the end of August. All of the past annual earnings data that are used in this study are the trailing earnings in the two most recent interim periods. There are three situations: if the transfer date is before April 30, then the earnings of the first half of the previous year and the second half of the year before are used as the trailing earnings; if the transfer date is between May and August, then the annual earnings of the previous year are used; and if the transfer date is after August, then the earnings of the first half of the same year and the second half of the previous year are combined. The book value of equity is derived from the most recent annual or interim report. In the periods after 2002 when quarterly reports were available, we continue to use semiannual approach for consistency. That is, we combine the first two quarters as the first interim period and the last two quarters as the second interim period.

prices is 1.04, while the median P/B ratio based on market prices is 3.83. The median P/E, in contrast, is 11.29 based on transfer prices and 42.50 based on market prices. The median return on equity (ROE) is 4.56% for all sample firms.

Since there are more floating shares after the split share structure reform, market prices will be adjusted downward accordingly. Thus, as shown in Panel B of Table 2, the market-to-transfer price ratio (MP/TP) and all the market price multiples (Market P/B and Market P/E) are significantly lower after the reform. However, we find that the transfer P/B and P/E before and after the reform are indifferent. It also shows that firms transferred before the reform are more profitable in terms of ROE than these transferred shares after the reform. It may be due to the fact that, with the anticipation of public trading after the reform, profitable firms are less likely to transfer shares privately because they can negotiate for higher premium by trading on the market.

The last panel of Table 2 also shows that, relative to the transfer of LP shares which involves mainly private entities, transfers of state shares involving government entities tend to have lower MP/TP ratio. In addition, the transfer price-to-book multiple (Transfer P/B) is higher in transfers of state shares. This is likely due to the lower bound of book value of equity imposed on the transfers of shares held by government entities. The rest of the statistics are statistically indifferent.

[Insert Table 2 here]

### **3. Development of hypotheses**

Together with the market prices observed from the stock market, there are in total three distinct types of pricing in China's stocks: transfer prices of state shares; transfer prices of LP shares and market prices of floating shares. The major difference among the three types is the

liquidity of the shares that are transferred or traded. The first two types are transfers of non-floating shares and hence they are less liquid than the last type (market prices) which are driven by market forces. Among the transfers of non-floating shares, the liquidity of transfers of state shares is more *illiquid* than that of transfers of LP shares because transfers of state shares must be approved by the Chinese government and are subject to price regulations.

The effects of liquidity on the transfer pricing mechanism can be discussed within the framework of residual income valuation model (Ohlson 1995) which is presented below:<sup>7</sup>

$$MV_0 = BV_0 + \sum_{t=1}^{\infty} \frac{E_t - r * BV_{t-1}}{(1+r)^t}. \quad (1)$$

The model decomposes the firm's equity value ( $MV_0$ ) at time 0 into two parts: book value of equity at time 0 ( $BV_0$ ) and present value of expected future residual income which is measured as the difference between earnings ( $E_t$ ) and normal earnings ( $r*BV_{t-1}$ ). The model indicates that the value of the firm would depend more on the value of the expected future residual income (and earnings) if  $E_t > r*BV_{t-1}$ . If  $E_t < r*BV_{t-1}$ , then the value of the firm will depend more on  $BV_0$ , the book value of equity.

When shares are not liquid, the cost of capital (the discount rate  $r$  in eq. (1)) will be higher for at least two reasons. First, owners of illiquid shares cannot diversify away the firm-specific risk. Thus, the cost of capital must be augmented by a non-negative firm-specific risk premium (e.g., Feldman 2005). Second, Amihud and Mendelson (1986) postulate that the owners of illiquid shares have to incur additional trading costs, including those related to searching, negotiation, and transaction, to transfer shares. They show a significant effect of their measure of

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<sup>7</sup> The Ohlson model is derived from the Gordon growth model or dividend discount model. We don't use Gordon's model because we intent to explicitly present the impacts of book value and earnings on market value separately.

illiquidity (i.e., the bid-ask spread) on realized returns. Thus, the pricing mechanism that is indicated by eq. (1) will be significantly affected by the level of illiquidity.

For non-floating shares in China before the reform, private transfer is the only way to sell such shares. This illiquidity constraint increases the cost of capital and reduces the importance of earnings. In other words, earnings are expected to play a less significant role in transfer prices than in market prices. In addition, within non-floating shares, the state shares are less liquid than LP shares since the transfer of state shares require approval.<sup>8</sup> Hence we expect earnings to play a less significant role in transfer prices of state shares than in LP shares. Thus, in the valuation model, the coefficients on earnings are expected to be different when the market prices of floating shares or the transfer prices of non-floating shares are used as the dependent variable. The expected order of the coefficients can be summarized in the following hypotheses:

*H1: Before the share structure reform, the coefficient on earnings in the valuation model is higher when the market price of floating A shares is used as the dependent variable than when the transfer prices of non-floating state and LP shares are the dependent variable.*

*H2: Before the share structure reform, the coefficient on earnings in the valuation model is higher when the transfer price of non-floating LP shares is used as the dependent variable than when the transfer price of non-floating state shares is the dependent variable.*

After the share structure reform, we expect H1 to continue to hold, but not H2. As discussed in Section 2.2, after the reform, the floating of state and LP shares is subject to a one-to three-year holding period. These shares are still less liquid compared with the floating shares.

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<sup>8</sup> In addition to the illiquidity impact, the price regulation on state share transfers also contributes to the less importance of earnings in valuation. As mentioned earlier, the transfer price of state shares cannot be lower than the book value of equity. If the intrinsic value of shares (as considered by the buyer or the seller) is lower than the book value, the shares have to be transferred at the book value. If the intrinsic value of shares is higher than the book value of equity, managers of government-controlled firms might not have incentives to negotiate a price that is higher than book value.



Thus, the prediction of H1 should continue to hold after the reform. However, after the reform, the transfer of state shares no longer needs governmental approval and there is no longer limitation of the transfer price. There should be no difference in the pricing mechanisms of state and LP shares.<sup>9</sup> Thus, the prediction of H2 would no longer apply after the reform.

## 4. Empirical Results

### 4.1 Regression model

We employ the following model to test the impact of book value and earnings on stock price:

$$PPS_{it} = \alpha + \beta EPS_{it} + \gamma BVPS_{it} + \varepsilon, \quad (2)$$

where  $PPS_{it}$  is the equity price per share,  $EPS_{it}$  is earnings,  $BVPS_{it}$  is the book value of equity, all on a per share basis, for firm  $i$  in period  $t$ .<sup>10</sup> Current earnings measure is used because it represents the expected future earnings if the firm continues to apply the current business technology. In addition, most research shows that annual earnings follow a random walk process, and it is difficult to improve on current earnings as a predictor of future earnings. To test the hypotheses, all of the transfer price data are pooled in the same regression. In testing the hypotheses,  $PPS$  can be the transfer price ( $TP$ ) of non-floating shares or the market price ( $MP$ ) of floating shares, which is observed on the settlement date of each transfer. Due to the high synchronicity of China's stock prices, the market prices that are observed on different dates are influenced significantly by the market movement. We neutralize the market effects by dividing

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<sup>9</sup> There was a new regulation <Temporary method on the transfer of listed company shares by state holders> imposed by SASAC and CSRC in 2007 ([http://www.gov.cn/ziliao/flfg/2007-07/09/content\\_677959.htm](http://www.gov.cn/ziliao/flfg/2007-07/09/content_677959.htm)). This regulation requires that if state holders sold more than 5% of listed company shares within 3 consecutive years, their trading should be approved by the SASAC. This makes state shares more illiquid compared with LP shares, which is the same as the situation before the reform. However, there are very few private transfers after 2008 and we are not able to control for this impact in the current study.

<sup>10</sup> In eq. (2), the number of shares outstanding is the deflator in all variables (or the scale variable). We choose this scale variable because it is recommended by Barth and Kallapur (1996, p. 556) as better than other variables such as book value of equity to deal with the scale issue. We alleviate the possible heteroskedasticity problems caused by using the per share values in the regressions by using White's (1980) approach to calculate all the  $t$ -values reported in this study.

*MP* by the rebased market index on the date on which *MP* is observed. This adjusted market price measure is denoted as *AMP*.<sup>11</sup> Because China followed a semi-annual reporting system during most of our study period, both *BVPS* and *EPS* are based on either the annual or semi-annual report that is available on the date on which the transfer was announced.

Table 3 provides the Pearson correlations of the variables that are used in the various specifications of eq. (2) before (upper-diagonal) and after (lower-diagonal) the split share structure reform. The first result worth mentioning is that, in the period before the reform, *TP* has very low correlations with *MP* (with a Pearson correlation of 0.09). However, their correlation in the period after the reform is much higher (0.48). *TP* is only somewhat more correlated with *AMP* (0.16 compared with 0.09) before the reform but *TP* has almost the same correlation with *AMP* after the reform (0.40 compared with 0.48). In addition, *TP* has generally higher correlations with *BVPS* than *MP* or *AMP* in both periods. Moreover, *EPS* and *BVPS* are highly correlated in both periods (0.54 before and 0.58 after the reform). This could partially be because *EPS* is part of *BVPS*. Surprisingly, in the period before the reform, the transfer prices have negative but very low correlation (-0.08) with the market index (*INDEX*), which is a rebased (using 1997 year-end as the base period) Shanghai or Shenzhen Stock Exchange index on the day on which the transfer was announced. This means that the transfer price is negatively affected by the overall market price level before the reform. After the reform, the transfer prices are positively correlated with market index (0.14), which is consistent with the liquidity impact. On the contrary, the market price is highly correlated with the market index in both periods (0.41 and 0.55). All the correlation estimations are significant at a level of 0.01 using a two-tailed test.

[Insert Table 3 here]

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<sup>11</sup> There are two market indices in China that cover the Shanghai and Shenzhen stock exchanges. To calculate *AMP*, the market price is divided by the rebased index (defining the index at end of 1997 as 1.0) of the exchange to which the firm belongs.

#### 4.2 Test of hypotheses: Stock liquidity and the pricing of earnings

Stock liquidity is the main factor to derive the two hypotheses. As we discussed in the previous section, before the share structure reform, there is a clear liquidity difference between transfers of floating shares and non-floating shares. After the reform, all non-floating shares have been converted to floating shares and thus there should be no difference in liquidity. However, after conversion to floating shares, they are still subject to selling provisions (typically one to three years). Thus it is interesting to test the hypotheses separately in the two periods. We report the regression results of eq. (2) for the sample periods before and after the reform in Table 4 and Table 5, respectively.

Panel A of Table 4 provides a test of H1 in the period before the reform, which predicts that, due to share liquidity, earnings should be more important in determining market prices than transfer prices. Both transfer prices (TP) and adjusted market prices (AMP) are used as the dependent variable in eq. (2) for all the 1,143 transfers incurred before the reform. This panel shows that *EPS* has a highly significant coefficient of 2.59 ( $p < 0.01$  based on the White-adjusted  $t$ -value of 8.17) when the market price (AMP) is used as the dependent variable.<sup>12</sup> This coefficient is significantly different from the insignificant coefficient of 0.15 on *EPS* in the regression using transfer prices as the dependent variable (with an F-statistic of 52.51). This large difference in the pricing of earnings reflects the effect of share illiquidity.

The panel also shows that book value of net assets (BVPS) is an important determination of both the TP and AMP. Not surprisingly, the coefficient on BVPS when TP is used as dependent variable is significantly higher than that when AMP is used as dependent variable (0.62 compared with 0.40 with an F-statistic of 5.45) since TP incorporates book value

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<sup>12</sup> To reduce the problems caused by extreme values, we winsorize all of the variables to within 1% and 99% of the values in all the regressions.

information only whereas AMP values both the book value and earnings information. We also find that the adjusted  $R^2$  in the regression using TP as the dependent variable is much higher than that in the regression using AMP (41.4% vs. 13.5%).

All the 1,143 share transfers before the reform are further divided into two groups: 522 transfers of state shares involving government entities and 621 transfers of LP shares involving private entities. Using transfer prices (TP) as the dependent variable in eq. (2), we run the regressions for the two groups separately and the results are reported in Panel B. In the regression of state shares sample, the coefficient on book value is very close to one (0.79) and the coefficient on earnings is not significant (0.04 with a  $t$ -value of 0.32). This indicates that the prices of the transfers of state shares involving government entities are primarily based on the book value of equity. This could be due to the lower bound of book value imposed by regulations on the transfer prices. It could be also due to the low incentives of government agencies or SOEs to negotiate a transfer price that would reflect the firm's profitability. The coefficient on *EPS* in the regression using the LP shares sample, however, is significant at the level of 0.05 (with a  $t$ -value of 2.17). However, this coefficient is not significantly different from the coefficient on *EPS* in the regression using the state share sample based on the F-statistic of 1.57. Thus, as predicted by H2, earnings seem to be less important when shares are less liquid and are subject to governmental intervention. We believe it is due to the illiquidity of share transfers caused by government intervention. The insignificant difference in coefficients on earnings may be explained by the fact that both types of shares transferred are non-floating shares and are subject to severe illiquidity. The panel also shows that the coefficient estimates on book value exhibit the same pattern as that reported in Panel A.

[Insert Table 4 here]

We rerun all the regressions for the share transfers after the share structure reform to test whether the two hypotheses still hold. As all non-floating shares have been converted to floating shares, we expect both transfer prices and market prices incorporate earnings information. However, since the converted floating shares are still subject to trading provisions, we expect transfer prices to incorporate less earnings information than market prices do according to H1. At last, since government intervention is removed after the reform, transfer prices involving government entities and private entities should incorporate similar earnings information. The results reported in Table 5 are consistent with our predictions. As shown in Panel A of Table 5, both the coefficient estimates on EPS are positive and significant at the level of 1%. However, the coefficient estimate on EPS when TP is used as dependent variable is significantly lower than when AMP is used as dependent variable (0.60 compared with 2.07 with an F-statistic of 17.99). When we partition the sample into transfers involving government entities (state shares) and private entities (LP shares), as shown in Panel B, both coefficient estimates on EPS are significantly positive and they are insignificantly different. In summary, we find consistent results with H1 but not with H2 after the reform.

[Insert Table 5 here]

#### *4.3 Stock illiquidity and the pricing of asset quality*

The results reported above show that illiquidity of non-floating shares results in less earnings information and more book value information incorporated in transfer prices.<sup>13</sup> The extent to which the transfer price depends on the book value of equity can be further detected

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<sup>13</sup> According to Ohlson's (1995) residual income model, if earnings are permanent, equity value should depend on earnings only; while if earnings are transitory, equity value should depend on book value of equity only. In the middle of these two extreme cases, the weight on earnings should increase as earnings become more persistent. Thus, if transfer prices reflect the different degrees of earnings persistence (a proxy for earnings quality), they should depend more on earnings when earnings are more persistent. In an untabulated robustness test, we classify samples into three groups based on the change of the firm's return on equity. We find that earning persistence (proxy for earnings quality) does not change our main results.

from the pricing of the quality of assets. Lack of market forces to discover prices, transfer prices may have no ability to incorporate quality of assets and only price face value of assets. This inefficiency in the pricing mechanism is also due to stock illiquidity.

Chinese accounting regulations allow the separation of two classes of assets in terms of quality. Chinese accounting standards require the footnote disclosure of “nonperforming assets,” which include receivables that are overdue for more than three years, unamortized expenses, deferred losses of asset sales, and capitalized startup costs. This type of asset, although remaining on the balance sheet according to Chinese accounting standards, should receive less value in the transfer than other assets. Thus, these two classes of assets are expected to receive different weights in the transfer pricing if the quality of assets is important.

We disaggregate assets and rewrite eq. (2) as follows.

$$TP_{it} = \alpha + \beta EPS_{it} + \gamma_1 RBVPS_{it} + \gamma_2 NAPS_{it} + \varepsilon, \quad (3)$$

where  $TP$  is the transfer price per share and  $RBVPS$  is the book value of equity per share minus the nonperforming assets per share ( $NAPS$ ).

Table 6 reports the regressions based on eq. (3) for all the sample share transfers in both the before and after the reform periods.<sup>14</sup> It also shows the regression results by further decomposition of samples into transfers of state shares involving government entities and transfers of LP shares involving private entities. Panel A of Table 6 shows that, before the reform, both the coefficients on  $RBVPS$  and  $NAPS$  are significantly positive, indicating transfer prices before the reform do not value the quality of assets. However, after the reform, only the coefficient on  $RBVPS$  is significantly positive and our interpretation is that market forces of free trading enables the transfer prices to discover the quality of assets. The coefficients on  $EPS$

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<sup>14</sup> The sample size in Table 6 is smaller than the full sample size since some firms have missing data on current and/or nonperforming assets.

depict the same pattern as reported in Table 4 and Table 5, i.e., transfer prices incorporate less earnings information before the reform than after the reform.

To further detect whether the pricing mechanisms of book value are different between transfers of state shares involving government entities and transfers of LP shares involving private entities for periods before and after the reform, we rerun all the regressions for samples reclassified based on transfer period (before or after the reform) and transfer type (state or LP shares). Panel B of Table 6 shows that, before the reform, the coefficient estimates of *NAPS* for both the state share transfers and the LP shares transfers are significantly positive and insignificantly different (0.89 compared with 0.62 with an F-statistic of 0.58 only). However, Panel C of Table 6 shows that, after the reform, the two coefficient estimates are insignificant and indifferent. It indicates that stock liquidity with market forces enables transfer prices to discount non-performing assets and hence discover the quality of assets.

[Insert Table 6 here]

## **5. Conclusions**

This study focuses on one very distinct aspect of China's stock market: its two-class system of shares, in which a significant portion of shares are non-floating and the remaining are floating on the exchange. Non-floating shares can only be transferred between government agencies or enterprises. Transactions that involve non-floating shares occur quite frequently, and during our study period from 1998-2008 we were able to obtain relevant data on 1,501 transfers involving 577 companies.

We examine the effects of share liquidity on the pricing of earnings with the presence of government involvement prior to the split share structure reform. We find that the transfer prices of non-floating shares involving government (state shares) are based primarily on the book value of net assets without considering earnings and the quality of assets. Earnings are priced only in

the transfers of LP shares between private entities. However, due to the illiquidity of shares, the weight of earnings in valuation is much lower in transfer prices than in the market prices of floating shares. Thus, despite the many irregularities in China's stock market, market prices generally reflect earnings information. In comparison, after the reform, earnings are priced in the transfers of both state and LP shares, although the weight of earnings in valuation is still less than that in the market prices of floating shares due to the holding period of one- to three-year before floating.

Several limitations should be pointed out in interpreting the results reported in this study. First, this study does not consider the motivations underlying the transfers of non-floating shares and their impact on the pricing. This has to be deferred to future research since the motivations involved complex political, social and economical factors, and it is difficult to predict their impact on the pricing of earnings. Second, the regression models used in this study offer no prediction of the magnitude of the coefficient on earnings. In the U.S., attempt has been made to evaluate the reasonableness of valuation models such as residual income model (e.g., Dechow *et al.* 1999). But the results are mixed. It is highly unlikely that any valuation model can describe the stock prices of China's fledging market with better degree of precision. Thus, it is impossible to judge whether earnings are properly incorporated in the transfer or market prices.

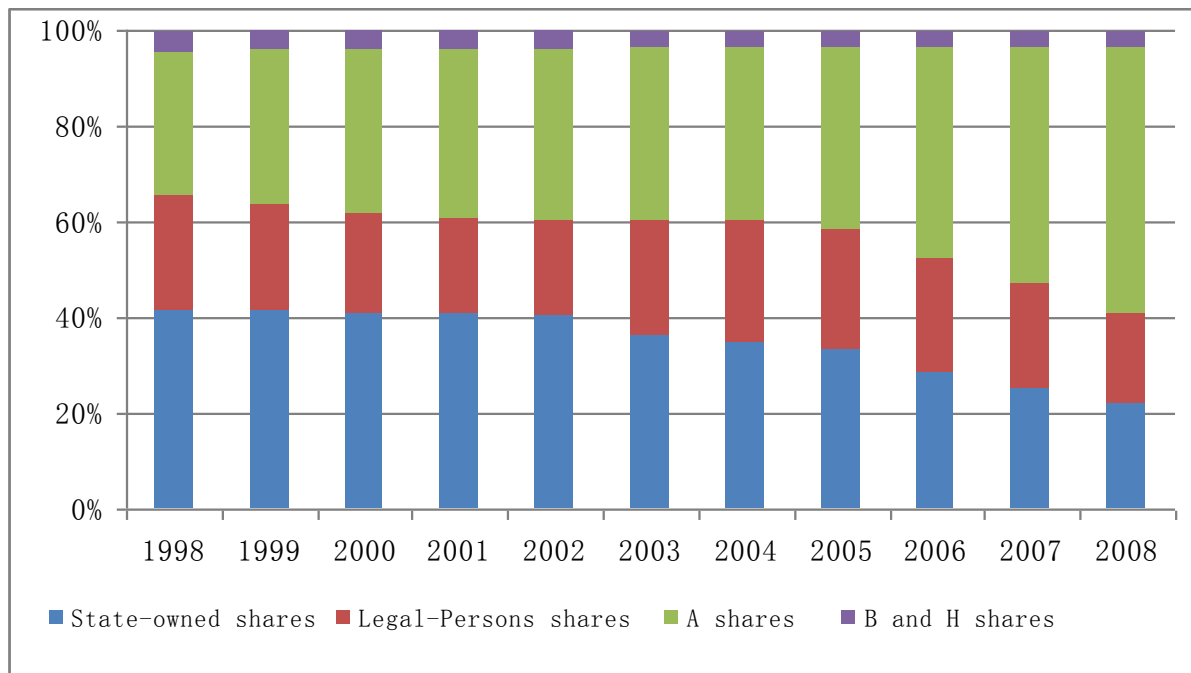
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**Figure 1**  
Distribution of types of shares in China<sup>a,b</sup>



<sup>a</sup> Both state and legal-person shares were not floating on the stock exchanges before 2005. Since 2005, they have been gradually converted to floating shares which are subject to one- to three-year sale restrictions. A shares are denominated in RMB and are traded on China's domestic exchanges; B shares are denominated in USD or HKD and are traded on China's domestic exchanges; H shares are denominated in HKD and are traded in Hong Kong's stock market.

<sup>b</sup> Data sources: Website of China Securities Regulatory Commission.

**Table 1**  
Descriptive statistics of the sample

<i>Panel A: Sample year distribution</i>								
Year	Frequency	Average transfer ratio %				Average transfer price in RMB		
		(Median)				(Median)		
1998	16	15.07				2.15		
		(8.64)				(2.00)		
1999	19	17.38				2.97		
		(18.80)				(2.18)		
2000	28	20.55				1.94		
		(19.53)				(1.76)		
2001	274	13.06				2.21		
		(9.37)				(2.15)		
2002	269	14.56				2.53		
		(10.54)				(2.18)		
2003	278	13.31				2.59		
		(9.72)				(2.22)		
2004	226	12.27				2.69		
		(8.98)				(2.46)		
2005	173	11.94				2.70		
		(4.78)				(2.45)		
2006	178	12.84				2.33		
		(8.78%)				(2.10)		
2007	29	11.44				2.96		
		(9.10)				(1.65)		
2008	11	14.99				4.11		
		(10.55)				(3.92)		
Total	1501	13.30				2.51		
		(9.38)				(2.20)		
before SSSR	1143	13.62				2.50		
		(10.00)				(2.20)		
after SSSR	358	12.27				2.57		
		(7.76)				(2.19)		
State shares	629	17.76				2.78		
		(15.00)				(2.40)		
LP Shares	872	10.08				2.32		
		(6.69)				(2.01)		

<i>Panel B: Transfer frequency</i>								
Number of transfers per firm, 1998-2008	1	2	3	4	5	6	7 and more	Total
Number of firms	213	140	88	58	32	19	27	577
Total number of transfers	213	280	264	232	160	114	238	1501

Note:

SSSR refers to the split share structure reform.

State shares are owned by government entities which include government agencies and state-owned enterprises (SOEs). LP Shares are owned by private entities include township and village enterprises, privately-owned enterprises, and foreign companies.

**Table 2**Descriptive statistics of transfer price, market price, and price-multiples <sup>a</sup>

<i>Panel A: Firms with share transfer</i>						
	<i>MP/TP</i>	<i>Transfer P/B</i>	<i>Market P/B</i>	<i>Transfer P/E</i>	<i>Market P/E</i>	<i>ROE(%)</i>
<i>Whole sample (N=1501)</i>	3.87	1.04	3.83	11.29	42.50	4.56
<i>Panel B: Before vs. After SSSR (1143:358)</i>						
<i>Before SSSR (N=1143)</i>	4.59	1.04	4.66	11.48	53.15	5.20
<i>After SSSR (N=358)</i>	2.45	1.04	2.30	9.91	22.50	2.91
<i>Wilcoxon z-statistic</i>	14.37 <sup>***</sup>	-0.03	14.52 <sup>***</sup>	1.16	6.02 <sup>***</sup>	3.42 <sup>***</sup>
<i>Panel C: State Shares vs. LP Shares (629:872)</i>						
<i>Transfers of State Shares (N=629)</i>	3.62	1.08	3.89	12.15	40.69	4.34
<i>Transfers of LP Shares (N=872)</i>	4.21	1.01	3.72	10.51	43.20	4.93
<i>Wilcoxon z-statistic</i>	-3.79 <sup>***</sup>	4.70 <sup>***</sup>	0.34	1.62	0.23	-1.52

<sup>a</sup> Variable definitions:*TP* = transfer price per share,*MP* = market price per share at the transfer agreement date,*Transfer P/E* = transfer price/earnings per share (EPS),*Transfer P/B* = transfer price/book value of equity per share (BVPS),*Market P/E* = market price/EPS,*Market P/B* = market price/BVPS,*ROE* = Return on equity.

SSSR refers to the split share structure reform.

\*\* Significant at a level of 0.01 using a one-tailed test.

\* Significant at a level of 0.05 using a one-tailed test.

**Table 3**

Pearson correlations of the variables used in the regressions for first period (before SSSR in upper diagonal) and second period (after SSSR in lower diagonal)<sup>a</sup>

	<i>TP</i>	<i>MP</i>	<i>AMP</i>	<i>EPS</i>	<i>BVPS</i>	<i>INDEX</i>
<i>TP</i>		0.09***	0.16***	0.38***	0.64***	-0.08***
<i>MP</i>	0.48***		0.90***	0.30***	0.21***	0.55***
<i>AMP</i>	0.40***	0.66***		0.35***	0.29***	0.17***
<i>EPS</i>	0.44***	0.35***	0.54***		0.54***	0.03***
<i>BVPS</i>	0.56***	0.33***	0.54***	0.58***		-0.08***
<i>INDEX</i>	0.14***	0.41***	-0.29***	-0.21***	-0.29***	

<sup>a</sup>Variable definitions:

*TP* = transfer price,

*MP* = market price,

*INDEX* = rebased (using 1997 year-end as base period) Shanghai or Shenzhen Stock Exchange index,

*AMP* =  $MP / INDEX$ ,

*EPS* = earnings per share, and

*BVPS* = book value per share.

SSSR refers to the split share structure reform.

\*\*\* Significant at a level of 0.01 using a two-tailed test.

**Table 4**

Test of the valuation model, using different prices and different samples (t-statistics are reported in parentheses) <sup>a</sup>

$$\text{Model: } TP_i \text{ (or } AMP_i) = \alpha + \beta EPS_i + \gamma BVPS_i + \varepsilon$$

Dependent variable	Intercept	<i>EPS</i>	<i>BVPS</i>	Adj-R <sup>2</sup> (%)	N
<i>Panel A: Before SSSR (N=1143)</i>					
<i>TP as dependent variable</i>	1.04 (15.19) <sup>***</sup>	0.15 (1.58)	0.62 (23.04) <sup>***</sup>	41.4	1143
<i>AMP as dependent variable</i>	7.79 (34.7) <sup>***</sup>	2.59 (8.17) <sup>***</sup>	0.40 (4.53) <sup>***</sup>	13.5	1143
<i>F-statistic testing the difference in pair of coefficients</i>		52.51 <sup>***</sup>	5.45 <sup>**</sup>		
<i>Panel B: State Shares vs. LP Shares (522:621)</i>					
<i>Transfers of State Shares (N=522)</i>	0.84 (9.41) <sup>***</sup>	0.04 (0.32)	0.79 (22.71) <sup>***</sup>	59.2	522
<i>Transfers of LP Shares (N=621)</i>	1.24 (12.96) <sup>***</sup>	0.28 (2.17) <sup>**</sup>	0.46 (11.89) <sup>***</sup>	27.8	621
<i>Wilcoxon z-statistic</i>		1.57	40.21 <sup>***</sup>		

<sup>a</sup> Variable definitions:

*TP* = transfer price,

*AMP* = market price/rebased market index,

*EPS* = earnings per share, and

*BVPS* = book value per share.

SSSR refers to the split share structure reform.

<sup>\*\*</sup> Significant at a level of 0.05 using a two-tailed test.

<sup>\*\*\*</sup> Significant at a level of 0.01 using a two-tailed test.

**Table 5**

Test of the valuation model, using different prices and different samples (t-statistics are reported in parentheses) <sup>a</sup>

$$\text{Model: } TP_i \text{ (or } AMP_i) = \alpha + \beta EPS_i + \gamma BVPS_i + \varepsilon$$

Dependent variable	Intercept	EPS	BVPS	Adj- R <sup>2</sup> (%)	N
<i>Panel A: After SSSR (N=358)</i>					
<i>TP as dependent variable</i>	1.78 (13.69) <sup>***</sup>	0.60 (3.22) <sup>***</sup>	0.43 (8.61) <sup>***</sup>	32.7	358
<i>AMP as dependent variable</i>	4.21 (19.35) <sup>***</sup>	2.07 (6.65) <sup>***</sup>	0.55 (6.55) <sup>***</sup>	36.5	358
<i>F-statistic testing the difference in pair of coefficients</i>		17.99 <sup>***</sup>	1.57		
<i>Panel B: State Shares vs. LP Shares (107:251)</i>					
<i>Transfers of State Shares (N=107)</i>	2.42 (9.07) <sup>***</sup>	0.95 (2.35) <sup>**</sup>	0.39 (4.05) <sup>***</sup>	28.8	107
<i>Transfers of LP Shares (N=251)</i>	1.54 (10.85) <sup>***</sup>	0.53 (2.69) <sup>***</sup>	0.44 (7.82) <sup>***</sup>	36.6	251
<i>Wilcoxon z-statistic</i>		1.03	0.28		

<sup>a</sup> Variable definitions:

*TP* = transfer price,

*AMP* = market price/rebased market index,

*EPS* = earnings per share, and

*BVPS* = book value per share.

SSSR refers to the split share structure reform.

\*\* Significant at a level of 0.05 using a two-tailed test.

\*\*\* Significant at a level of 0.01 using a two-tailed test.

**Table 6** The effects of asset quality on transfer prices <sup>a</sup>

$$Model: TP_i = \alpha + \beta EPS_i + \gamma_1 RBVPS_i + \gamma_2 NAPS_i + \varepsilon_i$$

Sample partitioning	Intercept	EPS	RBVPS	NAPS	Adj- R <sup>2</sup> (%)	N
<i>Panel A: Before SSSR vs. After SSSR</i>						
<i>Before SSSR</i>	1.01 (14.14)***	0.14 (1.41)	0.62 (23.15)***	0.87 (4.85)***	41.4	1133
<i>After SSSR</i>	1.56 (12.44)***	0.62 (3.69)***	0.48 (10.50)***	0.34 (1.12)	41.2	336
<i>F-statistic testing the difference in pair of coefficients</i>		7.19***	8.24***	2.73*		
<i>Panel B: classification based on whether government involved before SSSR</i>						
<i>State Shares before SSSR</i>	0.83 (8.92)***	0.04 (0.03)	0.79 (22.57)***	0.89 (3.88)***	59.2	519
<i>LP Shares before SSSR</i>	1.23 (12.15)***	0.24 (1.87)*	0.45 (11.89)***	0.62 (2.38)**	27.2	614
<i>F-statistic testing the difference in pair of coefficients</i>		1.06	40.91***	0.58		
<i>Panel C: classification based on whether government involved after SSSR</i>						
<i>State Shares after SSSR</i>	2.14 (9.35)***	1.05 (3.14)***	0.43 (5.52)***	0.42 (0.98)	45.1	101
<i>LP Shares after SSSR</i>	1.40 (9.41)***	0.51 (2.73)***	0.48 (8.88)***	-0.11 (-0.25)	41.8	235
<i>F-statistic testing the difference in pair of coefficients</i>		2.12	0.30	0.78		

<sup>a</sup> Variable definitions:

*TP* = transfer price,

*EPS* = earnings per share,

*TBVPS* = book value per share minus NAPS, and

NAPS = Non-performing assets per share.

<sup>b</sup> State shares are owned by government entities include government agencies and state-own enterprises (SOEs).

<sup>c</sup> LP shares are owned by private entities include township and village enterprises, privately-owned enterprises, and foreign companies.

\*, \*\*, \*\*\* Significant at a level of 0.10, 0.05 and 0.01, respectively, using a two-tailed test.