Three essays on the share structure reform in China

Zhu, Yanjian

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Three Essays on the Share Structure Reform in China

Zhu Yanjian

Nanyang Business School

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Nanyang Technological University of Singapore

Table of Contents

Acknowledgements II

Table of contentsIII

List of tables..... V

List of figures.....VI

Introduction..... 1

Chapter 1: Float, Speculation, and Stock Prices: Evidence from the Share Structure Reform in China..... 7

Abstract for Chapter 1 7

1.1 Introduction for Chapter 1 8

1.2 The Share Structure Reform in China..... 13

1.3 Motivation and methodology 19

1.3.1 Does speculation push up stock prices in China? 20

1.3.2 Will an increase in share supply reduce speculation?..... 22

1.4 Empirical results 23

1.4.1 Data sources and summary statistics..... 23

1.4.2 The price premium of tradable shares..... 25

1.4.3 Speculative component in the price premium of tradable shares 26

1.4.4 Inferences from share turnover and trading volume 31

1.4.5 Inferences from stock prices 35

1.4.6 Inferences from shareholder wealth..... 37

1.4.7 Impact on the b-share market..... 41

1.5 Summary and conclusion..... 44

Appendix:..... 46

References for Chapter 1: 48

Chapter 2: Strategic Trading by Informed Institutions: Evidence from Chinese Stock Markets..... 63

Abstract for Chapter 2.....	63
2.1 Introduction for Chapter 2	64
2.2 Institutional background and hypothesis development.....	69
2.2.1 Institutional background	69
2.2.2 Hypothesis development.....	72
2.3 Data sources and methodology	77
2.3.1 Data sources	77
2.3.2 Methodology	79
2.4 Empirical results	82
2.4.1 Trades before reforms across all restructured firms	83
2.4.2 Comparison between trades on restructured and control firms	87
2.4.3 Two factors that may affect strategic informed trading.....	89
2.4.4 Cumulative price changes due to trades of different sizes.....	92
2.4.5 Trades after reforms	95
2.5 Conclusion	96
References for Chapter 2:	98

Chapter 3: Related Party Transactions in China Before and After the Share

Structure Reform	123
Abstract for Chapter 3.....	123
3.1 Introduction for Chapter 3	124
3.2 Hypothesis development and related literature.....	128
3.3 Data.....	132
3.4 Empirical results	134
3.4.1 Descriptive information about RPTs	134
3.4.2 RPTs and corporate governance before the Share Structure Reform	135
3.4.3 RPTs and firm value before the Share Structure Reform	139
3.4.4 Change in RPTs before and after the Share Structure Reform	140
3.4.5 Market valuations of RPTs after the Share Structure Reform	142
3.5 Conclusion	144
References for Chapter 3:	146

List of Tables

Table 1.1: Illustration of the process to implement the Share Structure Reform by a common Chinese listed firm	51
Table 1.2: Progress of the Share Structure Reform	52
Table 1.3: Descriptive statistics	53
Table 1.4: Speculative component in the price premium of tradable shares	54
Table 1.5: Inferences from share turnover	56
Table 1.6: Inferences from trading volume.....	57
Table 1.7: Inferences from stock price	58
Table 1.8: Inferences from shareholder wealth.....	59
Table 1.9: Wealth gain and liquidity improvement	60
Table 1.10: Impact on the B-share market.....	61
Table 2.1: Trade size cutoffs for trades initiated by institutions and individuals	111
Table 2.2: Buy and sell trades for all restructured firms before reforms	112
Table 2.3: Net trades for all restructured firms before reforms	113
Table 2.4: Comparison between trades on restructured firms and control firms.....	114
Table 2.5: Characteristics summary for stocks in three sub-samples	116
Table 2.6: Net trades for the group with highest prior-reform institutional holding before reforms	117
Table 2.7: Net trades for the group with medium prior-reform institutional holding before reforms	118
Table 2.8: Net trades for the group with lowest prior-reform institutional holding before reforms	119
Table 2.9: cumulative price change, trades and volume by trade sizes	120
Table 2.10: Net trades of sample and sub-sample restructured firms after reforms	121
Table 3.1: Description about RPTs in years 2002-2006	148
Table 3.2: Summary statistics and correlation matrix for all relevant variables	151
Table 3.3: RPTs and corporate governance before the Share Structure Reform	153

Table 3.4: RPTs and firm value before the Share Structure Reform 155

Table 3.5: Changes in RPTs before and after the Share Structure Reform 156

Table 3.6: Proportion of firms with increased RPTs 157

Table 3.7: RPTs and firm value after the Share Structure Reform 158

Table 3.8: Announcement effect before and after the Share Structure Reform..... 160

List of Figures

Figure 1.1: Process of the Share Structure Reform..... 17

Figure 2.1: Institutional trades on restructured firms before reforms 103

Figure 2.2: Individual trades on restructured firms before reforms 105

Figure 2.3: Institutional trades on control firms before reforms..... 107

Figure 2.4: Individual trades on control firms before reforms..... 109

Introduction

In China, prior to April 29, 2005, about two thirds of all outstanding shares were mainly held by the government or government-linked agencies and cannot be traded in the open market. Only about one third of all outstanding shares, mainly held by individuals and some institutional investors, can be traded freely. The split share structure caused many serious problems: e.g. (1) deviation of price from fundamental values. The majority shareholders who made corporate policies and had the control of the company's profits and assets were indifferent to the fluctuations in stock prices. Too many investors were chasing limited number of tradable shares. The stock market was more like a casino than an intermediary channel of capital; (2) weak corporate governance and minority shareholder protection. Over half of all outstanding shares are restricted from free trading. Takeovers in the open market seldom occur. Due to certain historical reason, controlling shareholders have incentives to extract some wealth from listed companies at the expense of minority shareholders. Such incentives cannot be threatened by open-market takeovers. Minority tradable shareholders were weakly protected.

On April 29, 2005, Chinese government launched the Share Structure Reform to abolish the split share structure. All non-tradable shares were converted to be tradable. Non-tradable shareholders paid considerations to tradable shareholders to exchange for the liquidity improvement of their shares. The unique institutional background and the unique event in China provide us very good opportunities to investigate some issues in asset pricing, market structure, and corporate governance. Our studies add to the

literature in fresh ways and with evidence from outside-U.S. market. The thesis consists of three main chapters.

- **Float, Speculation, and Stock prices (Chapter 1)**

In the theoretical work by Hong, Scheikman and Xiong (2006), speculative bubbles arise because of the optimism effect and resale option effect. The optimism effect, first proposed in Miller (1977), argues that the stock price only reflects the optimists' opinions because investors with pessimistic opinions lack of means to participate in transactions due to the short sale constraints. Resale option effect argues that investors are willing to pay a price higher than the assessment of fundamentals for a share because they anticipate that they can sell the share at an even higher price in the future. This effect was firstly proposed in Harrison and Kreps (1978). Hong, Scheikman and Xiong (2006) also models that the bubble's size depends on float. Increase in float makes resale option less valuable and dampens the bubble.

The Split Share Structure and the Share Structure Reform in China provide us a unique opportunity to test the theory about the relationship between float, speculation and stock prices. Firstly, we attempt to capture the speculative component in A-share prices of Chinese stocks before the Share Structure Reform. In China, tradable A-shares are mainly held by inexperienced individuals who are more likely to have heterogeneous opinions. Short sales are forbidden by regulations. Another important feature of Chinese stock market is that float is limit. Only one third of all outstanding shares are tradable. According to the theory in Hong, Scheikman and Xiong (2006), there may be bubbles in Chinese A-share market. In normal cases, people are certain about the existence of

speculative bubbles only after they see the collapse of the bubbles. It is difficult to find a benchmark to detect bubbles before the collapse. However, in China, the price of non-tradable shares can serve as the benchmark of the bubble in tradable shares of the same company because these non-tradable shares cannot be traded in the open market and the price of them is free of speculative bubble. Although the price of non-tradable shares is unobservable, the Share Structure Reform provides us an opportunity to calculate the price premium of tradable shares against non-tradable shares. Regression analysis shows that the price premium is indeed significantly positively related to the proxies for speculation after we control for liquidity and other characteristics.

Secondly, we test the effect of float increase on speculative bubble. The direct consequence of the Share Structure Reform is a sudden increase in float, i.e. the supply of tradable A-shares. According to Hong, Scheikman and Xiong (2006), increase in float should dampen speculative bubble. We find that Chinese firms that were highly speculated before the reform experienced larger drop in stock price and smaller increase in share turnover and trading volume, and gained less shareholder's wealth in the reform than those firms that were less speculated. Results show that float increases around the Share Structure Reform indeed dampened speculative bubbles.

- **Strategic Trading by Informed Institutions (Chapter 2)**

Financial economists are interested to know how informed investors trade on the basis of their private information because their trading behavior affects the informativeness of market prices. Barclay and Warner (1993) find that medium-size trades move the prices most during the pre-tender offer announcement period.

Chakravarty (2001) observe similar phenomenon and find that these medium-size trades are mainly initiated by institutions. Medium-size trades are more prevalent in cases where private information is from illegal sources (Meulbroek (1992) and Cornell and Sirri (1992)). According to the theories in Holden and Subrahmanyam (1992) and Foster and Viswanathan (1996), if an agent receives insider information and is afraid that other agents may have the same information, he will trade aggressively to maximize profits. In U.S. where the law enforcement is strong, high probability of being caught and heavy penalty for illegal insider trading are likely to force the agent to trade stealthily, i.e. with medium-size trades. How will the informed institutions trade on the private information in China where the law enforcement is weak?

Share structure reforms of individual firms are announced in batches. Before the reform announcement, the list of firms in the next batch must be kept confidential until public release. However, this private information may leak out via some private channels. Informed institutions may trade on the private information in certain way. We firstly find that, in the two days before reform announcement date, institutions buy more shares of the firms in the next reform batch than in the normal trading days. These buying activities can make profits for the institutions. It seems that institutions possess private information and trade on the information aggressively, although trading on private information is illegal in China. Secondly, informed institutions trade the shares of these firms in large quantities and these trades move the prices most. The cumulative price change due to large-size trades as a proportion to the total price change in a day is significantly higher in the two days before the announcement date of the next batch of reforms. Unlike the stealth trading observed in U.S. market, Chinese informed

institutions trade on illegal private information directly in large quantity. We attribute such a difference to the different law enforcements between U.S. and China.

- **Related Party Transactions (Chapter 3)**

Related party transactions (RPTs) play a controversial role in corporate financial management. On one hand, RPTs between members of a business group can effectively deal with difficulties or constraints imposed by imperfect external markets. On the other hand, RPTs may be used by controlling shareholders to expropriate wealth at the expenses of minority shareholders. An increasing number of papers examine the prevalent RPTs in China (Jian and Wong (2004), Wang and Yuan (2006), and Cheung et al. (2007)). Deng, Gan and He (2007) relate the prevalence of RPTs in Chinese stock market to the unique “incomplete restructuring” process that most Chinese publicly listed firms have gone through. In this paper, we extend this line of research by examining two issues about RPTs in China.

The first issue is about the impact of RPTs on market valuation of Chinese listed firms. We use a database of RPTs for more than 1,000 firms to examine the relationship between firm value and RPTs. We find that firm values, as measured by Tobin’s Q, are negatively related to RPTs. At least part of the observed negative impact of RPTs on firm value is due to the close relationship between RPTs and corporate governance. We also follow Cheung, Rau and Stouraitis (2006) to study the market reactions to the announcement of RPTs. We observe strong negative abnormal returns in response to the announcement of RPTs before the Share Structure Reform.

The second issue is whether the Share Structure Reform changes the patterns of RPTs and their impact on market valuation. We compare RPTs before and after the Share Structure Reform. We find that, after the Share Structure Reform, RPTs increased in the absolute amount, but remained at the same level when scaled by total assets or total sales. The post-reform increase in RPTs is mainly due to the increase in business activities. We also compare the market reactions to the announcement of RPTs in pre- and post-reform periods. The evidence suggests that RPTs are not as detrimental to firm value after the reform as they were before the reform, especially for firms with high proportion of institutional holdings.

Chapter 1: Float, Speculation, and Stock Prices: Evidence from the **Share Structure Reform in China**

Abstract

The Share Structure Reform in China provides a unique opportunity to test recent theories about the internet bubble. Similar to the market conditions in the U.S. internet sector during late 1990s, Chinese stock market has many inexperienced investors, short sale restriction, and limited supply of shares. Ofek and Richardson (2003) and Hong et al. (2006) argue that these factors contribute to the rise of the internet bubble and that the bubble burst is due to increases in share float. Consistent with their arguments, we find that under similar market conditions in China, stock prices are inflated by speculation and an increase in public float dampens speculation. Specifically, after firms complete the reform, share float increased by 31.3% on average, and share prices dropped by 12.4% with a much larger drop among firms that were highly speculated before the reform. Despite the drop in share price, shareholders of restructured firms gained an increase in their wealth by an average of 14.8%. The B-share price discount also reduced significantly after the reform.

1.1 Introduction

The stock prices in the NASDAQ internet sector rose by over 1000% during the period from early 1998 through February 2000 and then fell precipitously in March and April 2000. What drove the rise and fall of internet stock prices has attracted a lot of attention and remains the subject of a debate. Ofek and Richardson (2003) contend that the rapid rise of internet stock prices occurred because internet stocks attracted many inexperienced investors who had diverse views on the prospects of internet stocks, public shares were in short supply because of lockup restrictions, and limited share supply effectively prohibited pessimistic investors from short selling. They attribute the subsequent collapse of internet stock prices to the concentrated expiration of lockup agreements, which made a great number of shares available for direct selling by corporate insiders and also for borrowing and short selling by public investors. Hong, Scheinkman and Xiong (2006) provide similar explanations in a theoretical model. They demonstrate that the combination of short sales constraint, investor heterogeneity and limited float (i.e. supply of public shares) can generate price bubble and, that an increase in public float could burst the bubble. However, Schultz (2006) uncovers new empirical evidence that the collapse of internet stock prices cannot be attributed to the increase in share supply. He finds that daily internet stock portfolio returns were almost unaffected by the number or dollar amount of lock-up expirations that day, or by the amount of stock offered in IPOs and SEOs. This evidence casts doubts on whether an increase in public float causes speculative prices to fall.

Our study sheds new lights on this debate with evidence from a unique event in China. Chinese stock markets provide an ideal setting to study this issue because they have all the conditions that Ofek and Richardson (2003) and Hong, Scheinkman and Xiong (2006) view as responsible for the development of a speculative bubble: the market is relatively young and dominated by inexperienced individual investors who are more likely to hold diverse views on the prospects of stocks; short sale is not allowed; and there is a limited supply of shares available for trade.

Prior to April 2005, only one third of the shares issued by exchange-listed companies in China are publicly tradable. The other two thirds, mainly owned by Chinese government agencies or government-linked enterprises, are not publicly tradable. On April 29, 2005, the China Securities Regulatory Commission (CSRC) announced a reform plan that aims to abolish the split share structure by converting all non-tradable shares to be publicly tradable. This event provides us a unique opportunity to study how an abrupt increase in share supply affects speculation and share prices. Thus, it allows an out-of-sample and outside-of-the-US-market test of the arguments in Ofek and Richardson (2003) and Hong, Scheinkman and Xiong (2006). They predict that stock prices in Chinese market contain a speculative component and the sudden increase of public float associated with the reform should dampen the speculative prices. We are interested to study whether the insights learned from the internet bubble in the U.S. market correctly forecast the behavior of Chinese stock markets in response to the reform.

It is usually impossible to directly test whether stock prices are in the midst of forming a speculative bubble, because the fundamental value of a stock is unobservable. We are now certain that there was an internet bubble because it has collapsed

spectacularly. The Chinese share structure reform creates a unique opportunity that enables us to investigate whether stock prices contain a speculative component without seeing the collapse of stock prices in Chinese markets. Since non-tradable shares cannot be traded and hence cannot be speculated, the value of non-tradable shares is free of any speculative component. In this study, we use the price difference between tradable and non-tradable shares to measure the extent to which speculation inflates the price of tradable shares. This difference usually cannot be computed directly because there is no observable price of non-tradable shares. We derive a formula that relates the difference to the reform plan that firms implemented in the share structure reform. This formula provides the necessary instrument to study the speculative component of stock prices.

If speculation indeed inflates stock prices in Chinese markets, the price difference we calculated would be positively related to empirical proxies for the degree of speculation in the cross-section of stocks. Consistent with this prediction, we find that the price difference is higher for stocks with higher dollar trading volume, which proxies the degree of speculation activity, after controlling for liquidity. We also find that the price difference is about 13% smaller for the stocks with both A- and B-shares than for the stocks with only A-shares.¹ That is, stocks that do not have B-shares have a larger speculative component in the price of A-shares than stocks that have B-shares. It is very likely because B-share prices serve as an anchor to subdue the speculation.

The direct consequence of the share-structure reform is a sudden increase of the supply of tradable A-shares. The number of tradable A-shares of firms in our sample

¹ In China, A-shares and B-shares are two classes of shares with identical rights, but all of the B-shares are tradable while only a portion of A-shares are tradable. Furthermore, A-shares can only be held by Chinese investors while B-shares can only be held by foreign investors before Chinese government relaxed the restriction in November 2001. Despite the identical rights, B-shares have been traded at a large discount relative to A-shares, known as the B-share discount puzzle.

increased, on average, by 31.3% on the first trading day after the completion of the reform. Ofek and Richardson (2003) and Hong et al. (2006) point out that an increase in share supply has the effect of reducing speculative prices. Our study shows that, on the first trading day after the reform, stock price of firms that were subject to intense speculation dropped by 15.1% relative to the last closing price before the reform. Moreover, during the first month of trading after the reform, the average daily share turnover of firms that were subject to intense speculation increased by 130% (compared to the average daily share turnover of the same firm in the one-month period before the reform), which is much less than the 167% increase in the average daily share turnover of control firms. In contrast, the average daily share turnover of firms that were less likely subject to speculation increased by 227%, which is greatly larger than the 111% increase in the average daily share turnover of control firms. The evidence is clear that the increase in public float dampened speculative trading and lowered speculative prices.

Other than contributing to the literature about the internet bubble, our paper is also related to the following literatures. First, our paper offers a unique event-study investigation to the relation between liquidity and stock prices. Similar to Silber (1991) and Longstaff (1995), we find that tradable shares command price premiums over their non-tradable counterparts, and our cross-sectional regression shows that the premium is positively related to the liquidity of tradable shares. In addition, we document significant increases in liquidity and firm value after firms complete the share structure reform. More importantly, there is a strong positive relation between the increase in firm value and the increase in liquidity. While Amihud and Mendelson (1986), Datar, Naik and Radcliffe (1998), and Brennan, Chordia and Subrahmanyam (1998) study the cross-

sectional relations between stock return and liquidity level, our study examines the relation between the change in firm value and the change of liquidity. We expect to obtain cleaner evidence on the relation between liquidity and stock price because a study of the change in liquidity of the same firm removes the effect of other factors that are potentially correlated with the level of liquidity, such as firm size, price level and volatility.

Second, we provide new evidence on whether demand curve is horizontal (i.e. perfectly elastic). Most of the asset pricing models such as CAPM or APT predicate on the assumption that assets have a perfect or close substitute, thus the demand curve for these assets are nearly horizontal. But some studies show empirical evidence that the demand curve is downward sloping. For example, Harris and Gruel (1986), Shleifer (1986), Lynch and Mendenhall (1997), and Wurgler and Zhuravskaya (2002) find positive abnormal returns of stocks when they are added to S&P 500 index, and Field and Hanka (2001) find negative abnormal returns when the IPO lock-up provisions expire. However, these studies cannot rule out the alternative explanation that their empirical evidence is partly due to the new information these events may carry. Being included into the S&P index may reflect good news despite Standard and Poor's claim to the contrary, while the expiration of IPO lock-up provisions may be associated with a larger than expected insider selling around expiration dates. In contrast, our study is based on a regulatory change that dictates an increase in public float for all firms. Thus we can rule out the information explanation of downward-sloping demand curve in our study.

Finally, our paper contributes to a growing literature of studies on Chinese financial markets. China has one of the fastest growing economies in the world.

According to Allen, Qian, and Qian (2005), China is the second largest economy on the purchasing power basis and if current trends continue, will become the largest economy in the world in ten years. The Shanghai Stock Exchange and the Shenzhen Stock Exchange of China have expanded rapidly since their inception in 1990 and 1991, respectively. At the end of 2002, the combined market capitalization of these two exchanges ranked eleventh in the world. The split-share structure of Chinese listed firms has long been viewed as the major roadblock for further development of Chinese markets. We find that the reform that was initiated in April 2005 and aims to abolish the split-share structure is successful and had positive impact on the market. Our evidence shows that the reform dampened speculative trading and improved liquidity. Despite the fact that the reform involves only tradable A-shares, it affected the B-shares market as well. The liquidity of B-shares increased and the average B-share discount reduced substantially from 44% before the reform to 29% after the reform. Mei, Scheikman and Xiong (2005) show that the B-share discount is partly due to the speculative component in A-share prices. Our evidence of smaller B-share discounts after the reform provides additional support that the reform dampened the speculation in the A-share market.

The rest of the paper is organized as follows. Section 1.2 details the share-structure reform in China. Section 1.3 motivates our study and introduces the research methodology. Section 1.4 presents our empirical results. Section 1.5 summarizes and concludes the paper.

1.2 The Share Structure Reform in China

Prior to April 2005, only one third of the shares issued by exchange-listed companies in China are publicly tradable. The other two thirds, primarily owned by Chinese government agencies or government-linked enterprises, are prohibited from public trading. This split share structure is the result of partial privatization of state-owned enterprises (SOE) by Chinese government. Chinese government started the SOE reform in 1978 by allowing employees and domestic institutions to own shares of SOEs. Because of the desire to conform to the communist public ownership principle, Chinese government kept the majority of shares under direct or indirect state control and disallow these shares from public trading. These shares are known as state shares or legal-person shares.² China established the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) in December 1990 and April 1991, respectively, to facilitate public trading of tradable shares. Only 14 firms were listed on both exchanges at the end of 1991. As of April 2005, 1353 firms list their shares on these two exchanges, the total market value of tradable shares equal to RMB 987 billion.

As Chinese market grew, this split share structure has proven to have many negative effects on the markets' further development. It has substantially distorted the pricing mechanism in the stock market and added uncertainty to investors' expectations. The majority shareholders who make corporate policies and have the control of the company's profits and assets are indifferent to the fluctuations in stock prices. As a result, prices and investor behavior do not reflect fundamental values of listed firm (Allen et al. 2005). The stock market is more like a casino than an intermediary channel of capital. Moreover, since the state owns two-thirds of a listed company, no other owner can hold the controlling interests of that company. The state is a notional controlling owner and

² Walter and Howie (2003) and Sun and Tong (2003) give detailed accounts of China's share privatization.

unable to supervise corporate actions effectively. As a result, there are few market-driven takeovers and mergers and no effective corporate governance, neither internal nor external. The rights of minority shareholders are frequently violated. Related party transactions are common that siphon assets from the company at the expenses of minority shareholders. In short, the split share structure hinders China from adopting international norms with respect to ownership structure, corporate governance and professional management, among other significant things. The reform of the split share structure is vital to the future development of China's capital market, according to Shang Fulin, Chairman of the China Securities Regulatory Commission (CSRC), in his speech at the press conference organized by the State Council of China on June 27 2005.

On April 29 2005, Chinese government announced a reform plan that aims to abolish the split share structure by converting all non-tradable shares to be publicly tradable. An important feature of this reform plan is that non-tradable-share owners are required to pay a consideration to tradable-share owners before their shares become tradable. The objective of this requirement is to stabilize stock price and preserve shareholder wealth. Non-tradable shares gain additional value when they become tradable. If non-tradable-share owners do not share this gain with tradable-share owners, tradable-share owners have incentives to sell their holdings before restructuring takes effect, which will drive down stock prices. Chinese regulators learned this lesson from an earlier attempt to float non-tradable shares in 2001. In June 2001, Chinese regulators allowed non-tradable-share owners to gradually sell their shares in the public market without paying a consideration to tradable-share owners. By October 2001, the Shanghai Stock Exchange index dropped by 24% and the Shenzhen Stock Exchange index dropped

by 29%. The substantial loss of investors' wealth forced regulators to delay and eventually stop the selling of non-tradable shares in June 2002.

In the new reform plan of April 2005, Chinese regulators require listed-firms take a set of measures to implement the reform. Figure 1.1 illustrates the time frame of a typical restructuring process. The process is characterized by two trading suspension periods. Before the first suspension period, the company calls for the major non-tradable-share owners to come up a restructuring plan that proposes a consideration package. Once non-tradable-share owners reach an agreement on this plan, the company announces the official start of its restructuring process on day D0 and requests the stock exchange to suspend trading of its shares from the next trading day. During the first suspension period, the company reveals details of the proposed restructuring plan and consults tradable-share owners for their opinions via press releases, road shows, investor symposiums, etc. Non-tradable-share owners revise the restructuring plan to reflect the inputs from tradable-share owners. The company will announce the finalized plan on day D1, which marks the end of the first trading suspension. Trading resumes on the next day after day D1 and continues until D2. This period gives investors an opportunity to buy or sell the shares before an extraordinary shareholder meeting is called for the approval of the restructuring plan. Only shareholders who hold shares at the closing of day D2 are registered for the extraordinary shareholder meeting and face the consequences of the restructuring. The second trading suspension begins on the day after D2. An extraordinary shareholders' meeting is called for to vote on the plan. Only when over two thirds of all tradable shareholders who participate in the meeting agree with the restructuring plan, can the plan be approved. Once approved, the plan takes effect and

trading resumes on day D3. To limit the sudden impact on stock price, although shares held by non-tradable-share owners are legally tradable after reform, they are normally restricted from trading within the first year after the reform. The supply of tradable shares increased immediately after the completion of the reform because of the bonus shares that non-tradable-share owners transfer to tradable-share owners.

Figure 1.1: Process of the Share Structure Reform

Table 1.1 illustrates the restructuring process by chronicling the events that happened to TongRenTang, a well-known traditional Chinese medicine and cosmetic company listed on the Shanghai Stock Exchange. On October 15 2005 (i.e. D0), the company announced the start of its restructuring process. It has 434 million outstanding shares, 64.2% of them are non-tradable and the rest 35.8% tradable, the closing price on that day is RMB 20.38.³ On the next trading day, trading is suspended and the company revealed the plan which states that non-tradable-share owners pay 0.22 shares for every share held by tradable share owners. Tradable share owners did not like this ratio and voiced their opinions strongly. As a result, non-tradable-share owners revise the ratio to be 0.25 shares for every share. The revised plan is confirmed on October 26 2005, which marks the end of the first trading suspension. Trading resumed on the next day (i.e. D1)

³ The exchange rate is about RMB8.09 for US\$1. At this rate, the price is equivalent to US\$2.52.

with a closing price of RMB 19.9. Trading continues until the shareholder registration day November 10 2005 (i.e. D2) and the closing price is RMB 19.92. Trading is suspended again on the next day and registered shareholders vote for the approval of the plan. The plan was approved with an approval rate of 98.8% among all tradable-share holders who participated the voting. The plan became in effect on November 25 2005. According to the final plan, non-tradable shares account for 55.24% of shares and tradable shares increased by almost 9% to be 44.76%. Trading resumed on November 30 and closed at the price of RMB 15.40, which is substantially lower than RMB 20.38 on the last day before the reform.

[Table 1.1 is about here.]

To avoid destabilizing the stock market, Chinese government arranged listed-firms to implement the reform in batches. The first batch of four companies started the reform process on May 9 2005, followed by the second batch of 42 firms starting on June 20. All firms in these two batches, except one, completed share restructuring within a short time period. The success of the first two batches strengthened regulators' confidence and prompted them to extend this reform to all listed companies. Table 1.2 shows the progress of firms that have started share restructuring process in the first 21 batches. After the first batch of four companies, the number of companies in other batches varies between 13 and 46. The total number of companies in the first 21 batches is 509, and 478 of them have completed the reform by the end of March 2006. Companies went through the reform process at different speed. Some companies completed the process in 38 days, while others took as long as 89 days. We examined the final plans that every one of these companies adopted to complete the reform, and found

that 384 of the 509 firms had a plan in which non-tradable-share owners transfer a proportion of the holdings to tradable-share owners as the only form of consideration paid to tradable-share owners. In next section, we develop a methodology that utilizes this subsample of firms to study speculative stock prices.

[Table 1.2 is about here.]

1.3 Motivation and Methodology

It is well known that share turnover in Chinese market is extremely high: the aggregate turnover as a percentage of the total market capitalization in 2002 is 224% of the total market capitalization (Allen et al. 2005). By comparison, the figure is 160% on the Nasdaq and 95% on the New York Stock Exchange. Witnessing such high a level of share turnover, observers of Chinese stock markets often claim that Chinese market is speculative.

Studies of the internet bubble in the U.S. markets, especially Ofek and Richardson (2003) and Hong et al. (2006), provide possible explanations why speculation arises in Chinese market. The theory in Hong et al. (2006) asserts that in the presence of heterogeneous belief and short-sale constraints, limited float magnifies the upward bias that the resale option of tradable shares and investor optimism introduce in the price of tradable shares. The resale option of tradable shares inflates stock prices because investors anticipate a buyer willing to pay more in the future and thus are willing to pay prices that exceed their own assessment of current fundamental value (Harrison and Kreps 1978 and Scheinkman and Xiong 2003). Investor optimism causes the upward

bias in price because when investors hold heterogeneous beliefs and there exists short-sale constraints, the pessimistic group lack of means to participate and stock price only reflects the beliefs of the optimistic group (Miller 1977 and Chen et al. 2002).

Ofek and Richardson (2003) document that during the bubble period, internet stocks attracted many inexperienced investors who had diverse views on the prospects of internet stocks, public shares were in short supply because of lockup restrictions, and limited share supply effectively prohibited pessimistic investors from short selling. They argue that these forces jointly pushed stock prices to an extremely high level.

Similar to the market conditions in the internet sector during the U.S. internet bubble period, Chinese market is relatively young and dominated by inexperienced individual investors who are more likely to hold diverse views; short sale is not allowed in China; and there is a limited supply of shares available for trade. Thus the arguments in Hong et al. (2006) and Ofek and Richardson (2003) are applicable and predict the existence of speculation in Chinese market. However, there is little evidence on whether and to what extent speculation pushes up stock prices in Chinese market.

1.3.1 Does speculation push up stock prices in China?

It is usually impossible to directly test whether stock prices are in the midst of forming a speculative bubble, because the fundamental value of a stock is unobservable. Mei et al. (2005) study 75 Chinese stocks that have both A- and B- shares and find that the price of A-shares is too high relative to B-shares and the difference is partly due to speculative trading. The evidence in Mei et al. (2005) applies to only a small portion of Chinese market as there were more than 1,000 listed firms in Chinese markets. Besides,

the price difference between A-shares and B-shares is also influenced by other factors such as the level of information asymmetry and liquidity.⁴

The Share Structure Reform creates a unique opportunity that enables us to investigate whether stock prices contain a speculative component without seeing the collapse of stock prices in Chinese markets. We are able to construct a measure that captures the speculative component in Chinese stock prices, if there is any. As detailed in Section 1.2, the reform requires non-tradable-share owners pay a consideration to tradable-share owners before their shares become tradable. The consideration that non-tradable-share owners pay to tradable-share owners depends on both the value of non-tradable shares and the market price of tradable shares. In the case where non-tradable-share owners transfer their shares to tradable-share owners as the consideration, we derive a mathematical relationship between the amount of the consideration and the price premium of tradable shares over non-tradable shares.⁵ We describe the relationship below and put the derivation details in the Appendix.

Let N_1 and N_2 represent the number of non-tradable shares and the number of tradable shares before share structure reform. Suppose b is the number of shares that non-tradable-share owners pay to tradable-share owners for every tradable share they hold before the reform.⁶ After restructuring is completed, the number of shares held by original non-tradable-share holders will decrease to $N_1 - b \cdot N_2$ and the number of shares held by original tradable-share holders will increase to $N_2 + b \cdot N_2$. Let P_{10} be the unobservable value of non-tradable shares before the reform, and P_{20} the market price of

⁴ Chan et al. (2006) find that difference in the level of information asymmetry between these two markets explains a substantial portion of the B-share price discount.

⁵ As shown in Table 3.2, the majority of the firms adopt this simple consideration plan.

⁶ All these figures refer to only A-shares because the reform does not involve B-shares.

tradable shares before the reform. We define L as the *price (or value) premium* of tradable shares over non-tradable shares, that is, $L = (P_{20} - P_{10})/P_{10}$. Derivation in the Appendix shows that

$$L = \frac{b}{a - b + a \cdot b} \quad (1)$$

where $a = \frac{N_1}{N_1 + N_2}$ is the proportion of non-tradable shares before the reform. This

formula makes sense intuitively. It shows that *ceteris paribus*, the price premium of each tradable share over its non-tradable counterpart is related to the proportion of the non-tradable shares and the consideration that non-tradable shareholders need to pay tradable shareholders in order to acquire the liquidity of their shares. We can use the formula to calculate the unobservable price premium based on the observed values of a and b .

The price premium captures the speculative component in the price of tradable shares because tradable shares can be resold at favorable prices in future while non-tradable shares have no resale value. Speculative trading affects the price (value) difference between tradable and non-tradable shares to the same extent as if affects the price of tradable shares. In Sections 1.4.2 and 1.4.3, we provide evidence that part of the price premium is due to speculation.

1.3.2 Will an increase in share supply reduce speculation?

The theory in Hong et al. (2006) suggests that the value of the resale option is negatively related to public float. Increases in public float reduce the option value and lower investors' incentives to buy shares, which helps to depress speculative trading.

Ofek and Richardson (2003) attribute the collapse of internet stock prices to the concentrated expiration of lockup agreements, which made a great number of shares available for direct selling by corporate insiders and also for borrowing and short selling by public investors. We can test their theories by examining the changes in trading activities and stock prices that happened to Chinese firms during the share structure reform.

The direct consequence of the share structure reform is the increase in the supply of tradable shares. Tradable-share owners can immediately sell the shares that non-tradable-share owners transfer to them. As a result, the supply of tradable shares increases substantially on the first trading day after the reform is completed. The arguments of Hong et al. (2006) and Ofek and Richardson (2003) predict that an increase in public float dampens speculation. Thus, we expect that Chinese firms that were highly speculated before the reform have larger drop in stock price and smaller increase in share turnover and trading volume than those firms that were less speculated. Sections 1.4.4 and 1.4.5 report related empirical analysis in details.

1.4 Empirical Results

1.4.1 Data sources and summary statistics

We collect the information about share restructuring from the information disclosure website officially designated by the China Securities Regulatory Commission⁷. We also collect profitability measures such as the return on equity (ROE) and the return

⁷ The URL of the website is <http://www.cninfo.com.cn>.

on assets (ROA) from the same website for the fiscal year ending on December 31, 2004. We obtain daily stock prices and daily trading volume from the Bloomberg system.

A total of 509 firms have started the share structure reform in the first 21 batches before March 25 2006 (Table 1.2). Thirty-six of them are still in the process of the share structure reform as of March 25 2006. Eighty-nine of the 478 firms that have completed the restructuring process adopted a consideration plan that is more complex than simply transferring shares from non-tradable-share owners to tradable-share owners. After excluding IPO firms in the year before April 29 2005 and firms whose price data are not available from Bloomberg terminal, our final sample includes 309 firms.

Table 1.3 summarizes the characteristics of firms in our sample. The market price of tradable A-shares ranges from 1.72 RMB to 27.6 RMB at the closing of April 28 2005, which is the day before CSRC announced the reform plan to abolish the split-share structure. The average price is 5.5 RMB. Market capitalization, calculated as the closing price on April 28 2005 *times* the number of tradable A-shares, ranges from 87 million RMB to 8.1 billion RMB, with an average of 731 million RMB. The average daily dollar volume during the one-year period before April 29, 2005 varies considerably across our sample firms, with the minimum of 0.687 million RMB, the maximum of 89.011 million RMB and the mean of 9 million RMB. The majority of our firms are profitable; the ROE and ROA of more than 75% of our firms are greater than 4.47% and 1.76%, respectively. The proportion of trading days with a zero return in the one-year period before April 29 2005 ranges from 0.42% to 11.5% and has an average of 3.69%. The return volatility is the standard deviation of daily returns in the one-year period before April 29 2005, and has the mean of 2.4%.

[Table 1.3 is about here.]

1.4.2 The price premium of tradable shares

As Equation (1) shows, the price premium of tradable shares over non-tradable shares is related to the proportion of tradable A-shares to total A-shares and the consideration non-tradable-share owners pay to tradable-share owners. Table 1.3 reports that firms in our sample have an average of 136 million A-shares outstanding before share restructuring. The proportion of tradable A-shares is 35% on average. Non-tradable-share owners in these firms paid an average of 0.313 shares to tradable-share owners for every tradable share. We calculate the price premium of tradable shares based on Equation (1). The average price premium of tradable shares is 60.8%. That is, tradable shares are about 60.8% more valuable than non-tradable shares.

The evidence is consistent with several studies that document a positive price premium of tradable shares over non-tradable shares. Longstaff (1995) conducts a theoretical analysis within an option pricing framework and finds that trading restriction reduces share values. Silber (1991) studies restricted stocks⁸ that cannot be traded in the open market in the first year of placement, and finds that the issue price of restricted stocks is set much lower than the prevailing market price -- the median discount is 33.75%. In China, although non-tradable shares cannot be publicly traded, under certain circumstances, they are allowed to be transferred from one owner to another through private placements and auctions. Chen and Xiong (2001) collect the auction and private placement prices of non-tradable shares of 258 Chinese firms and compare them with the

⁸ Restricted stocks are issued by public firms and sold through private placements to investors under the SEC Rule 144.

market prices of tradable shares. They report that the price discount on non-tradable shares is 78% for auctions and 86% for private placement.

All of these studies attribute the price premium of tradable shares to trading restrictions on non-tradable shares. However, because the arguments of Ofek and Richardson (2003) and Hong et al. (2006) predict there is speculation in Chinese market, we argue that part of the price premium in Chinese tradable shares is due to speculation. We provide empirical evidence in the following section.

1.4.3 Speculative component in the price premium of tradable shares

If part of the price premium is due to speculation, we expect the price premium is positively related to variables that proxy for the extent of speculation. Hong et al. (2006) show that speculative trading generates trading volume. This suggests that high trading volume proxies for the intensity of speculative trading.

A second variable that we use capture the speculation effect is a dummy variable that is equal to one when the firm has both A- and B-shares and zero otherwise. Mei et al. (2005) find that the A-shares of firms that have both A- and B-shares are overpriced due to speculation. Since the B-share price serves as an anchor that helps to prevent price from deviating too far away from the fundamental value, the influence of speculation on A-share prices should be even greater for firms with only A-shares. We thus expect a lower price premium for firms that have both A- and B-shares.

A third variable that we use to proxy for speculation is the stock price. Low-price stocks are very likely traded by individual investors. Lee and Radhakrishna (2000) analyze the TORQ data released by the NYSE and find that most of the trades in large

firms are initiated by institutional investors and most of the trades in small firms are initiated by individual investors. Analysis of the data on mutual-fund holdings in China shows that institutional investors hold, on average, only 2.44% of tradable-shares among the bottom one-third stocks sorted by price level.⁹ In the Hong et al. (2006) model, the resale option value increases in the overconfidence parameter that measures the degree of behavioral bias. Many individual investors in China are inexperienced and are more likely to be influenced by their instinct. Therefore, low-price stocks that are populated by individual investors are likely to have a larger speculative component in the price premium of tradable shares.

To sum up, we expect the following hypothesis to be true if the price premium of tradable shares in Chinese market contains a speculative component.

Hypothesis 1: *The price premium of tradable shares in Chinese market is positively related to trading volume, lower for firms that have both A- and B-shares, and larger for low-price firms.*

To test this hypothesis, we run a cross-sectional regression of price premium against these variables. Because liquidity affects the cross-sectional variation in the price premium to the same extent as it affects the cross-sectional variation in the price of tradable shares, we also include variables that are related to firm-level liquidity such as market capitalization, trading volume, price, and volatility. These variables are common

⁹ The results are not tabulated for the sake of brevity, but available upon request.

proxies for the implicit and explicit costs of trade and market quality.¹⁰ Recently, Lesmond et al. (1999) find that the percentage of zero return days proxies for liquidity because if transaction costs inhibit more informed investors from trading, more zero returns will be observed. Bekaert et al. (2003) and Lesmond (2005) recommend that the percentage of zero return days be a principal liquidity proxy in emerging markets.¹¹ Therefore, we also include the percentage of zero return days to control for the effect of liquidity on the price premium.

In addition, Silber (1991) and Chen and Xiong (2001) find evidence that the price premium of tradable shares over non-tradable shares is negatively related to firms' profitability. This is because non-tradable shares of profitable firms tend to have a better chance of finding a potential buyer through private placement and thus are more valuable, which reduces the price premium of tradable shares. We thus include the profitability measures, ROE and ROA, in the regression.

In sum, the following variables are included in our regression of the price premium:

- Average daily trading volume (in million RMB) for the one-year period before April 29 2005, in natural logarithm
- Market capitalization (in million RMB) calculated as the closing price on April 28, 2005 multiplied by the number of tradable A-shares before share restructuring, in natural logarithm

¹⁰ See, e.g., Harris (1994), Benston and Hagerman (1974), Brennan and Subrahmanyam (1995), Keim and Madhavan (1997), Pagano (1989), and Stoll and Whaley (1983).

¹¹ Lesmond et al. (1999) and Lesmond (2005) find that the percentage of zero-return days is highly correlated with other proxies such as quoted bid-ask spread and Roll's measure of the effective spread. Bekaert et al. (2003) find that the percentage of zero return days significantly predicts future returns in emerging markets, whereas turnover does not.

- Reciprocal of the closing price (in RMB) on April 28 2005
- Return on equity (ROE) and return on assets (ROA) for fiscal year 2004
- Percentage of zero return days in the one-year period before April 29 2005
- Daily return volatility measured by the standard deviation of daily returns in the one-year period before April 29, 2005
- A dummy that equals one if the company has both A- and B-shares, and zero otherwise. Twenty-seven firms in our sample have both A- and B-shares.

Panel A of Table 1.4 reports correlation coefficients between these variables. Trading volume and market capitalization are highly correlated with a correlation coefficient of 0.76, while ROE and ROA are highly correlated with a correlation coefficient of 0.86. The other correlation coefficients seem reasonable and unlikely to raise concerns of multicollinearity problem.

[Table 1.4 is about here.]

Panel B of Table 1.4 reports the estimated coefficients from four regressions of the price premium of tradable shares on these factors. Because ROE is highly correlated with ROA and trading volume is highly correlated with market capitalization, we include them in the separate regressions. Consistent with the evidence in Silber (1991) and Chen and Xiong (2001), the profitability measures, ROE and ROA, are significantly negative in all regressions. Volatility was found to be related to liquidity in previous literature, but it is insignificant in our regressions. The coefficient of the percentage of daily zero return days is significantly negative at 5% level in all four regressions. Stocks that have high percentage of zero-return days tend to have high transaction costs, and thus lower price premium. The coefficients of both trading volume and market capitalization are

significantly positive at 5% level in all regressions. However, both speculation and liquidity predict a positive effect of trading volume on the price premium. This is not a clean evidence of the speculation effect.

The last two variables in the regression provide stronger evidence of the speculation effect. The coefficient of the reciprocal of share price is significantly positive at 1% level in all four regressions. This is consistent with our hypothesis that low-price stocks are populated by individual investors and thus experience a stronger speculation effect. The other variable is the dummy variable that equals 1 for firms with both A- and B-shares. After controlling for the effect of transaction costs, profitability and liquidity, the dummy variable is significantly negative in all four regressions. This means, firms that have both A- and B-shares have a smaller price premium. It is consistent with our expectation that B-share prices serve as an anchor that helps to prevent A-share prices from deviating too far away from the fundamental value. Mei et al. (2005) find that the A-shares of firms that have both A- and B-shares are overpriced due to speculation. The evidence here tells us that the influence of speculation on A-share prices is even greater for firms with only A-shares.

In summary, we find that tradable shares of Chinese listed firms have an average price premium of 60.8% over non-tradable shares. The price premium is related to proxies for companies' profitability, tradable shares' liquidity and transaction costs. Moreover, the price premium in Chinese market is significantly related to proxies for speculative trading in stock market, such as trading volume, the price level and the existence of B-shares. Based on the evidence, we conclude that there is a distinct speculative component in Chinese stock prices.

1.4.4 Inferences from share turnover and trading volume

The theory in Hong et al. (2006) suggests that the value of the resale option is negatively related to public float. An increase in public float reduces the option value and lowers investors' incentives to buy shares for speculative purpose. For the same reason, Ofek and Richardson (2003) argue that the increase in the supply of shares due to concentrated expiration of lockup agreements caused the collapse of internet stock prices in early 2000. The supply of tradable shares increased by an average of 31.3% on the first trading day after Chinese firms completed the share structure reform. The arguments in Ofek and Richardson (2003) and Hong et al. (2006) predict that the reform would depress speculation in Chinese markets. More specifically, firms that were highly speculated before the reform would respond to the reform differently than firms that were less influenced by speculation. In this section, we draw inferences from share turnover and trading volume on this prediction.

As more tradable shares are available after the reform, share turnover and trading volume tend to increase due to the availability of more trading opportunities. For firms that were subject to strong influence by speculation before the reform, the reform dampens speculation and reduces speculation-driven trading. The decrease in trading due to less speculation cancels out the liquidity-driven increase. Whereas, for firms that were less influenced by speculation before the reform, the decrease due to less speculation would be smaller. Thus we hypothesize the following:

Hypothesis 2: *Share turnover and trading volume increase after the reform due to more trading opportunities. Firms that were highly speculated before the reform have smaller increase than firms that were less speculated because of the dampening effect of the reform.*

To test this hypothesis, we need to separate highly speculated firms from less speculated ones. We use daily dollar volume before the reform to proxy for the extent of speculation. We classify firms that have the daily dollar volume above the median as highly speculated firms, and firms below the median as the less speculated ones. We compare how these two groups of firms respond to the reform.

First, we examine the evidence from share turnover. We measure the change in share turnover of restructured firms as follows. We define the change in daily turnover as $(\text{Average daily turnover after reform}) / (\text{Average daily turnover before reform}) - 1$. Daily turnover is equal to the daily number of A-shares traded divided by the total number of tradable A-shares. The average daily turnover before reform is based on the 30 trading days immediately before April 29, 2005. We choose this pre-reform period because trading after April 29 2005 is likely affected by CSRC's announcement of the reform plan. The average daily turnover after reform is based on the first 30 trading days after the restructured firm completed the reform. Table 1.5 reports the summary statistics of the change in daily turnover.

[Table 1.5 is about here.]

The mean (median) change in share turnover of highly speculated firms is 1.295 (1.010). In contrast, less speculated firms on average experienced much greater increase

in share turnover than highly speculated ones, with the mean (median) change in share turnover being 2.255 (1.987). The conventional t and Wilcoxon tests show that the mean and median differences between these two groups are both statistically significant at 1% level.

However, the results from conventional tests may be unreliable because the changes in share turnover are potentially correlated across restructured firms. For all restructured firms, we measure the change in share turnover against the same pre-reform period, i.e. the 30 trading days before April 29 2005. They are likely influenced by the same market-wide shift in trading activities. To overcome the potential correlation, we conduct a randomization test on the difference between highly speculated and less speculated firms.¹² For each of the 309 restructured firms in our sample, we find five control firms that have not started share restructuring by the end of March 2006, are in the same industry as the restructured firm and have the closest market capitalization. We measure the change in daily turnover for each control firm as $(\text{Average daily turnover after reform}) / (\text{Average daily turnover before reform}) - 1$. The pre-reform period is again the 30 trading days immediately before April 29, 2005. The post-reform period is the same as that of the corresponding restructured firm, i.e. the first 30 trading days after the restructured firm completed the reform.

We use the changes in share turnover of these control firms to simulate an empirical distribution of the mean difference between highly speculated and less speculated restructured firms. Specifically, we randomly select one out of the five control firms to replace a restructured firm in our sample. This generates a pseudo

¹² The randomization test is suggested by Bernard (1987) and MacKinlay (1997) to overcome correlation among sample observations.

sample of 309 control firms. This sample can be accordingly divided into highly speculated and less speculated sub-sample based on the classification of corresponding restructured firms. We then calculate the mean difference in the change of share turnover between the two sub-samples. We repeat this process 200 times to obtain 200 mean differences.¹³ These 200 differences constitute a simulated empirical distribution of the mean difference, against which we can test the significance of the actually observed mean difference between highly speculated restructured firms and less speculated counterparts. A test on the median difference can be implemented in the same way. In the last columns of Table 1.5, we report the 1st, 5th and 10th percentile of this empirical distribution. The results show that both mean and median differences are significant at 1% level under this randomization test.

Since trading volume proxies for liquidity as well, to control for potential confounding effect of liquidity, we separate firms of high liquidity from those of low liquidity by the median percentage of zero return days before the reform. The percentage of zero return days is a reliable measure of liquidity and has a low correlation with daily trading volume. We compare highly speculated firms with less speculated ones within each liquidity group. Both the conventional tests and randomization test show that highly speculated firms had significantly less increase in turnover than less speculated ones regardless of the level of liquidity. This evidence is consistent with the prediction of Hong et al. (2006) that an increase in public float reduces speculation-driven turnover.

Next, we examine evidence from dollar trading volume, which is another measure of trading activities. For every restructured firm, we calculate the change in daily dollar volume as (Average daily dollar volume after reform) / (Average daily dollar volume

¹³ We repeat our analysis with 500 times and obtain qualitatively the same results.

before reform) -1. The average daily dollar volume before reform is based on the 30 trading days immediately before April 29, 2005. The average daily dollar volume after reform is based on the first 30 trading days after the restructured firm completed the reform. Table 1.6 reports the summary statistics of the change in daily dollar volume, and shows a similar pattern as in Table 1.5. The mean (median) change in trading volume of highly speculated firms is 1.544 (1.130), whereas the mean (median) change in trading volume of less speculated firms is 2.740 (2.096). The difference between these two groups is statistically significant under both conventional and randomization tests, with and without control for liquidity.

[Table 1.6 is about here.]

In summary, firms that completed share restructuring experienced an increase in share turnover and trading volume after the reform. But highly speculated firms had significantly smaller increase in turnover and trading volume than less speculated ones. The evidence supports Ofek and Richardson (2003) and Hong et al. (2006)'s assertion that an increase in public float reduces the speculation-driven trading.

1.4.5 Inferences from stock prices

Several studies document evidence that the short-term demand curve of stocks is downward sloping. Harris and Gurel (1986), Shleifer (1986), Lynch and Mendenhall (1997), Wurgler and Zhuravskava (2002), and others document significant abnormal returns of around 3% when stocks are added to the S&P 500 index. In contrast, stocks have significant negative abnormal returns around removal from the S&P 500 index. Similar results are reported for stocks that are added to or deleted from foreign indexes.

Since the share structure reform increases the supply of tradable shares substantially, a downward sloping demand curve implies a drop in stock price immediately after the reform.

In the previous section, we observe evidence that speculative trading diminished after the reform. As a result, firms that were highly speculated before the reform are subject to downward price pressure due to both the increase in float and the decrease in speculation-driven demand. Therefore we expect that:

Hypothesis 3: *Share prices decrease after the reform due to the downward sloping demand curve. Firms that were highly speculated before the reform have larger price decline than firms that were less speculated because of the dampening effect of the reform.*

We report empirical evidence on the price effect of the reform in the following. For each of the 309 restructured firms in our sample, we measure the price impact as $(\text{Price of tradable shares after reform}) / (\text{Price of tradable shares before reform}) - 1$. Price before reform is the closing price on April 28 2005. Note that it is important to choose the market price before CSRC's April 29 2005 announcement of the split-share structure reform. Once the reform plan was publicly announced, the transaction price of a tradable share incorporates investors' expectation that tradable-share owners would receive compensation from non-tradable-share owners. Price after reform is the closing price on the first trading day after the completion of share structure reform¹⁴. Because Chinese

¹⁴ We also use the closing price on the 30th trading day after the reform in a robust analysis. The results are qualitatively the same and available upon request.

regulators prohibited listed firms from issuing new shares, rights offers and dividends before they complete the share-structure reform, the price after reform represents the same claim on the firm's future cash flows as the price on April 28 2005. Table 1.7 reports the summary statistics of the price impact.

[Table 1.7 is about here.]

Stock prices dropped substantially across all restructured firms. The average price drop of all firms is -12.4%. Highly speculated firms had an average drop in share price of 15.1% while less speculated firms had only 9.8%. The difference between these two groups is statistically significant at the 1% level. Similar to the previous section, we use the median percentage of zero return days before the reform to separate firms of high liquidity from those of low liquidity. We compare highly speculated firms with less speculated ones within each liquidity group. Highly speculated firms had greater price drop than less speculated ones. The conventional t and Wilcoxon tests show that the difference between these two groups is statistically significant regardless of the level of liquidity. The randomization test shows consistent outcome albeit at a lower significance level. The evidence indicates that the speculative component in the pre-reform stock prices is reduced after the reform.

1.4.6 Inferences from shareholder wealth

The above evidence clearly shows that stock prices declined after the reform. Does it mean that the share restructure reform reduced shareholder's wealth? The answer is of great interest to Chinese investors and regulators and warrants a detailed analysis.

On one hand, non-tradable-share owners benefit from the reform because their shares acquire liquidity. On the other hand, the price drop after the reform reduces the value of the shares held by tradable-share owners before the reform. But because non-tradable-share owners are required by Chinese regulators to pay consideration to tradable-share owners, tradable-share owners will also gain from the reform as long as they receive sufficient amount from non-tradable-share owners. There is evidence that tradable-share owners extract adequate payment from non-tradable-share owners through the negotiation process required by Chinese regulators. In the example of the reform process of Tong Ren Tang in Section 1.2, non-tradable-share holders proposed an initial plan of paying tradable-share holders 2.2 shares for every 10 shares they have. Through negotiation, the payment ratios increased to 2.5 shares for every 10 shares. We also conduct a more thorough analysis of the 384 firms whose consideration plan involves only transfer of shares from non-tradable-share owner to tradable-share owners, and find that 267 of them revised up the payment ratio after negotiation. The smallest increase in the number of shares paid for every 10 shares is 0.1 (e.g. stock code 600654), the largest increase 1.2 (e.g. stock code 000936), and the mean and median increases are 0.44 and 0.40. The evidence suggests that the negotiation process played an important role to protect tradable-share owners' interest. Thus we expect the tradable-share owners to benefit from the reform.

However, we find in the previous two sections that the reform reduces the speculative component in the pre-reform price and the effect is stronger for firms that were highly speculated. This price effect will have an influence on shareholders' wealth. Therefore, we hypothesize the following:

Hypothesis 4: *Shareholder wealth increases after the reform due to the strong protection mechanism put in place by Chinese regulators. Firms that were highly speculated before the reform have smaller increase than firms that were less speculated because of the dampening effect of the reform.*

In the following, we examine the change in shareholder wealth after the reform. For each of the 309 restructured firms, we measure the change in shareholder wealth by $(\text{the price of tradable shares} \times \text{the total number of tradable shares after reform}) / (\text{the price of tradable shares} \times \text{the total number of tradable shares before reform}) - 1$. The total number of tradable shares after reform is equal to the total number of tradable shares before reform *plus* the bonus shares non-tradable-share owners paid to tradable-share owners. The price of tradable shares before reform is the closing price on April 28th, 2005. The price of tradable shares after reform is the closing price on the first trading day after the completion of share structure reform. As we explain in the previous section, it is important to use the price of tradable shares before the announcement of the share-structure reform on April 29 2005 so that both the prices before and after the reform can be comparable. Table 1.8 reports the summary statistics of the change in shareholder wealth.

[Table 1.8 is about here.]

Table 1.8 shows that, despite the drop in stock prices after reform, shareholder wealth increased by an average of 14.8% for restructured firms after the reform. There is a big difference between highly speculated firms and less speculated ones. The average

increase is 10.7% for highly speculated firms, but a much higher 18.9% for less speculated firms. The difference is statistically significant at 1% level under both conventional and randomization tests. That is, highly speculated firms had significantly less increase in shareholder wealth than less speculated ones. This is true regardless of the level of liquidity. The evidence is consistent with our hypothesis that the reform dampens the speculative component of stock prices and reduces shareholder wealth.

Is the increase in shareholder wealth related to the improvement in liquidity after the reform? The source of the wealth gain is because the reform increases share supply and thus improve liquidity. In particular, the wealth of non-tradable-share holders increased because of the liquidity that their shares acquire after the reform. Tradable-share holders benefit from the share transfer from non-tradable-share holders. If liquidity drives the wealth gain, we expect that firms that have a larger improvement in share liquidity have a larger gain in shareholder wealth.

To test this expectation, we regress the change in shareholder wealth on three variables that proxy the change in liquidity -- the change in daily turnover, the change in dollar volume, and the change in the percentage of zero-return days. Since we need a six-month period to calculate the percentage of zero-return days after the reform, our sample size reduces from 309 to 188 in the regression for the percentage of zero-return days. We also include other variables in the regressions to control for cross-sectional differences among restructured firms. The regression results in Table 1.9 support our expectation that the amount of wealth gain to shareholders is significantly positively related to the improvement in share liquidity. Thus we conclude that the reform increases the wealth gain through the improvement in share liquidity.

[Table 1.9 is about here.]

1.4.7 Impact on the B-share market

A total of 90 Chinese listed firms have issued both A- and B-shares. All B-shares are tradable. They were initially only available to foreign investors until Chinese government relaxed the restriction in November 2001. Since then, domestic investors can also own and trade B-shares. Since only A-shares have separate tradable and non-tradable portions, the share structure reform aims to convert all non-tradable A-shares to be tradable A-shares. Owners of tradable A-shares are entitled to the consideration paid by non-tradable-share holders. B-shares are not involved in the reform. In the previous sections, we find that share restructuring improves the liquidity of A-shares and increases the wealth of A-share owners. In this section, we study how the reform affects the B-share market.

We exclude 31 of the 90 firms from our analysis because they do not satisfy our data requirement.¹⁵ Twenty-seven of the remaining 59 firms have completed share restructuring before March 25 2006 and paid only bonus shares as the consideration. We call them the restructure firms. The other 32 firms had not started the restructuring process before March 25 2006. We use them as the benchmark firms. We obtain the price and trading volume data from the Bloomberg system.

First, we examine the change in B-share prices and the change in daily B-share turnovers of both restructured and benchmark firms after the reform. We define the change in B-share price for both restructured and benchmark firms as the difference

¹⁵ Twenty of them were undergoing the reform as of March 25 2006, five completed reform before March 25 2006 but had a complex consideration package, and six do not have price data in the Bloomberg system.

between the post-reform price on March 24 2006 and the pre-reform price on April 28 2005 divided by the pre-reform price. We define the change in daily B-share turnover as the difference between the post-reform turnover and the pre-reform turnover divided by the pre-reform turnover. Daily turnover is equal to the ratio of the number of B-shares traded to the total number of B-shares outstanding. For restructured firms, the pre-reform turnover is the average of daily turnover over the 30 trading days immediately before April 28 2005, and the post-reform turnover is the average of daily turnover over the 30 trading days immediately after March 24 2006. For benchmark firms, the pre-reform turnover is the average of daily turnover over the 30 trading days immediately before April 28 2005, and the post-reform turnover is the average of daily turnover over the 30-trading-day period immediately after March 24 2006. Part A of Table 1.10 reports the summary statistics.

[Table 1.10-is about here.]

We find that on average, the post-reform daily turnover increased by 170% for restructured firms, but only 74% for benchmark firms. The B-share price increased by 22% for restructured firms, but only 11% for benchmark firms. The differences between restructured and benchmark firms are economically substantial. To assess their statistical significance, we conduct a randomization test to overcome the potential correlation among sample observations. The correlation arises because the changes in turnover and price are measured over the same time period for all restructured and control firms. We randomly sample with replacement from the benchmark firms to construct 200 pseudo samples of size 27 and calculate the mean change in turnover of each pseudo sample. The 200 mean changes constitute an empirical distribution against which the significance

of the observed mean change in turnover of the restructured sample can be obtained. For example, the mean change in turnover of the restructured sample is 170%. It is significantly different from that of the benchmark firms at 5% level because the 95th percentile of the empirical distribution generated from benchmark firms is only 98.74%. Overall, the test results show that the reform had a statistically significant impact on the B-share market in both share turnover and stock price.

Next, we examine the pre- and post-reform B-share price discounts of both restructured and benchmark firms. The pre-reform B-share discount is the price difference between A-share and B-share as a percentage of the B-share price on April 28 2005. The post-reform B-share discount is the price difference between A-share and B-share as a percentage of the B-share price on March 24 2006. Consistent with previous studies on B-share discount, we find that B-shares traded at lower prices than their A-share counterparts for both restructured firms and benchmark firms; the mean (median) discount was 43.8% (44.7%) for restructured firms and 43.1% (44.7%) for benchmark firms.¹⁶ In the post-reform period, the B-share discounts of benchmark firms remain almost the same with a mean (median) of 43.4% (42.7%), but the B-share discounts of restructured firms became much smaller with a mean (median) of only 30.3% (29.3%). Randomization tests shows that the mean (median) B-share discount of restructured firms is not statistically different from that of benchmark firms before the reform, but significantly different after the reform. Therefore, we conclude that the reform significantly reduces the B-share discount.

¹⁶ Previous studies on B-share discount include Bailey (1994), Sun and Tong (2000), Chan et al. (2006), Mei, Scheinkman and Xiong (2005), and Chen, Lee and Rui (2001), to name a few.

1.5 Summary and Conclusion

Similar to the market conditions in the internet sector of the U.S. market during late 1990s, Chinese stock markets have many inexperienced investors, short sale restriction, and limited supply of shares. We find clear evidence that Chinese stock prices are inflated by speculation, and an increase in public float dampens speculation. This is consistent with the arguments that Ofek and Richardson (2003) and Hong et al. (2006) use to explain the rise and fall of the internet bubble. Since it is such rare an opportunity to quantify and study the effect of speculation on stock prices, our study provides important evidence that helps to understand the conditions responsible for the development of a speculative bubble.

Our study takes advantage of the opportunity created by the share structure reform in China. The China Securities Regulatory Commission initiated this reform on April 29 2005 with the purpose to convert non-tradable shares of all Chinese listed firms to be publicly tradable. Firms that completed the reform had an average increase of 31.3% in the supply of tradable shares in the first trading day after the reform. Share turnover and trading volume increased after the reform, while stock prices dropped. Firms that were subject to intense speculation before the reform had significantly smaller increase in turnover and trading volume, and larger drop in stock price than firms that were less speculated. Despite the drop in stock prices, both tradable-share and non-tradable-share owners benefited from the reform. The wealth of tradable-share owners increased, on average, by 14.8% after the reform. The reform also substantially reduced the price discount of the B-shares relative to the counterpart A-shares.

The reform successfully removed the split-share structure and reduced speculation. However, it does not resolve all the conditions for the development of a speculative bubble. In particular, the short sale restriction and the large crowd of inexperienced individual investors still exist in China. Once the demand for shares outgrow the supply of shares, a speculative bubble is likely to develop in Chinese stock markets.

Appendix:

Let P_{10} and P_{20} represent the prices of non-tradable and tradable shares before share structure reform; N_1 and N_2 represent the number of non-tradable shares and the number of tradable shares before share structure reform; b is the number of bonus shares as the consideration that non-tradable-share owners pay to tradable-share owners for every tradable share; P is the price of all shares after share restructuring completes. Note that all these numbers refer to only A-shares because all B-shares are tradable and B-share owners are not entitled for the consideration paid by the non-tradable-share owners.

Let Z be the total gain to the shareholder value due to restructuring, Z_1 be the gain to non-tradable-share owners, and Z_2 be the gain to tradable-share owners. After restructuring, the number of shares held by original non-tradable-share owners will decrease to $N_1 - b \cdot N_2$ and the number of shares held by original tradable-share owners will increase to $N_2 + b \cdot N_2$. We can calculate these gains as follows

$$Z = (N_1 + N_2) \cdot P - (N_1 \cdot P_{10} + N_2 \cdot P_{20}), \quad (\text{A1})$$

$$Z_1 = (N_1 - b \cdot N_2) \cdot P - N_1 \cdot P_{10}, \quad (\text{A2})$$

$$Z_2 = (N_2 + b \cdot N_2) \cdot P - N_2 \cdot P_{20}. \quad (\text{A3})$$

Assuming that non-tradable-share owners and tradable-share owners divide the total gain Z in proportion to the number of shares they own after restructuring¹⁷, we have

¹⁷ In the general equilibrium model by Li et al. (2007), the distribution of gain in the Share Structure Reform is determined by the bargaining power of non-tradable and tradable shareholders. Our analysis is consistent with the bargaining framework studied by Li et al. (2007).

$$Z_1 = \frac{N_1 - b \cdot N_2}{N_1 + N_2} \cdot Z \quad (\text{A4})$$

$$Z_2 = \frac{N_2 + b \cdot N_2}{N_1 + N_2} \cdot Z \quad (\text{A5})$$

By substituting Equations (A1) and (A2) into Equation (A4) and rearranging, we obtain

$$-a \cdot (1-a) \cdot P_{10} = b \cdot a \cdot (1-a) \cdot P_{10} - a \cdot (1-a) \cdot P_{20} + b \cdot (1-a)^2 \cdot P_{20} \quad (\text{A6})$$

where $a = \frac{N_1}{N_1 + N_2}$ is the proportion of non-tradable shares.

Let L represent the percentage price difference between tradable and non-tradable shares, that is,

$$L = \frac{P_{20} - P_{10}}{P_{10}} \quad (\text{A7})$$

By combining Equations (A6) and (A7) and canceling the unobservable value of non-tradable shares P_{10} , we can write L as follows

$$L = \frac{b}{a - b + a \cdot b} \quad (\text{A8})$$

The above formula shows that, for every firm, the *Price Premium* of tradable shares relative to non-tradable shares is related to the bonus share ratio b published in the share structure reform plan and the proportion of non-tradable shares a . According to this formula, as long as $b < \frac{a}{1-a}$, the price premium is positive. The upper bound $\frac{a}{1-a}$ is larger than 1 if and only if the proportion of non-tradable shares a is greater than 50%. The proportion a is more than 50% for most Chinese listed firms and the bonus shares ratio b must be less than 1. Thus the formula yields a positive price premium of tradable shares over non-tradable shares for Chinese firms.

References:

Allen, Franklin, Jun Qian and Meijun Qian, 2005, Law, finance, and economic growth in China, *Journal of Financial Economics* 77, 57-116.

Amihud, Yakov and Haim Mendelson, 1986, Asset pricing and the bid-Ask spread, *Journal of Financial Economics* 17, 223-249.

Bailey, Warren, 1994, Risk and return on China's new stock markets: Some preliminary evidence, *Pacific-Basin Finance Journal* 2, 243-260.

Bekaert, Geert, Campbell Harvey and Christian Lundbald, 2003, Liquidity of emerging markets: lessons from emerging markets, *Working paper*, Duke University, Durham, North Carolina.

Benston, George J. and Robert L. Hagerman, Determinants of bid-asked spreads in the over-the-count market, *Journal of Financial Economics* 1, 353-364.

Bernard, Victor L., 1987, Cross-sectional dependence and problems in inference in market-based accounting research, *Journal of Accounting Research* 25, 1-48.

Brennan, Michael J. and Avanidhar Subrahmanyam, 1995, Investment analysis and price formation in securities markets, *Journal of Financial Economics* 38, 361-381.

Brennan, Michael J., Tarun Chordia and Avanidhar Subrahmanyam, 1998, Alternative factor specifications, security characteristics, and the cross-section of expected stock returns, *Journal of Financial Economics* 49, 345-373.

Chan, Kalok, Albert J. Menkveld and Zhishu Yang, 2006, Information asymmetry and asset prices: Evidence from the China foreign share discount, *The Journal of Finance*, Forthcoming.

Chen, G.M., Bong-soo Lee, and Oliver Meng Rui, 2001, Foreign ownership restrictions and market segmentation in China's stock markets, *The Journal of Financial Research* 24, 133-155.

Chen, Zhiwu, and Peng Xiong, 2001, Discounts on illiquid stocks: evidence from China, *Yale ICF Working Paper* No. 00-56.

Chen, Joseph, Harrison Hong and Jeremy C. Stein, 2002, Breadth of ownership and stock returns, *Journal of Financial Economics* 66, 171-205.

Datar, Vinay T., Narayan Y. Naik and Robert Radcliffe, 1998, Liquidity and stock returns: An alternative test, *Journal of Financial Markets* 1, 203-219.

Field, L., and G. Hanka, 2001, The expiration of IPO share lockups, *The Journal of Finance* 56, 471-500.

Harris, L., and E. Gruel, 1986, Price and volume effects associated with changes in S&P 500 list: New evidence for the existence of price pressures, *The Journal of Finance* 41, 815-829.

Harris, Lawrence E., 1994, Minimum price variations, discrete bid-ask spreads, and quotation sizes, *The Review of Financial Studies* 7, 149-178.

Harrison, J. Michael and David M. Kreps, 1978, Speculative investor behavior in a stock market with heterogeneous expectations, *Quarterly Journal of Economics* 92, 323-336.

Hong, Harrison, José Scheinkman, and Wei Xiong, 2006, Asset float and speculative bubbles, *The Journal of Finance* 61, 1073-1117.

Keim, Donald B. and Ananth Madhavan, 1997, Transactions costs and investment style: an inter-exchange analysis of institutional equity trades, *Journal of Financial Economics* 46, 265-292.

Lee, Charles M. C. and Balkrishna Radhakrishna, 2000, Inferring investor behavior: evidence from TORQ data, *Journal of Financial Markets* 3, 83-111.

Lesmond, D. A., J. P. Ogden and C. A. Trzcinka, 1999, A new estimate of transaction costs, *Review of Financial Studies* 12, 1113-1141.

Lesmond, D. A., 2005, Liquidity of emerging markets, *Journal of Financial Economics* 77, 411-452.

Li, Kai, Tan Wang, Yan-Leung Cheung and Ping Jiang, 2007, Removing market friction and sharing the gain: evidence from the split share structure reform in China, *Working paper*.

Longstaff, Francis A., 1995, How much can marketability affect security values? *The Journal of Finance* 50, 1767-1774.

Lynch, Anthony W., and Richard R. Mendenhall, 1997, New evidence on stock price effects associated with changes in the S&P 500 index, *The Journal of Business* 70, 351-383.

MacKinlay, Craig A., 1997, Event studies in economics and finance, *Journal of Economic Literature* 35, 13-39.

Mei, Jianping, José Scheinkman, and Wei Xiong, 2005, Speculative trading and stock prices: Evidence from Chinese A-B share premium, *working paper*.

Miller, Edward, 1977, Risk, uncertainty and divergence of opinion, *The Journal of Finance* 32, 1151-1168.

Ofek, Eli and Matthew Richardson, 2003, Dotcom mania: The rise and fall of internet stock prices, *The Journal of Finance* 58, 1113-1137.

Pagano, Marco, 1989, Trading volume and asset liquidity, *The Quarterly Journal of Economics* 104, 255-274.

Scheinkman, José, and Wei Xiong, 2003, Overconfidence and speculative bubbles, *Journal of Political Economy* 111, 1183-1219.

Schultz, Paul H., 2006, Downward sloping demand curves, the supply of shares, and the collapse of internet stock prices, AFA 2007 Chicago Meetings Paper.

Shleifer, Andrei, 1986, Do demand curves for stocks slope down? *The Journal of Finance* 41, 579-590.

Silber, William L., 1991, Discounts on restricted stock: The impact of illiquidity on stock prices, *Financial Analysts Journal* 47, 4, 60-64.

Stoll, Hans R. and Robert E. Whaley, 1983, Transaction costs and the small firm effect, *Journal of Financial Economics* 12, 57-79.

Sun, Qian and Wilson Tong, 2000, The effect of market segmentation on stock prices: the China syndrome, *Journal of Banking and Finance* 24, 1875-1902.

Sun, Qian and Wilson Tong, 2003, China share issue privatization: The extent of its success, *Journal of Financial Economics* 70, 183-222.

Walter, C. E., and Howie, F. J. T., 2003, Privatizing china: The stock markets and their role in corporate reform. Singapore: John Wiley & Sons (Asia).

Wurgler, Jeffrey, and Ekaterina Zhuravskaya, 2002, Does arbitrage flatten demand curves for stocks? *The Journal of Business* 75, 583-609.

Table 1.1: Illustration of the process to implement the Share Structure Reform by a common Chinese listed firm

Full Name	BEIJING TONGRENTANG CO., LTD		
Security Short Name	Tong Ren Tang		
Security Code	600085		
List Exchange	Shanghai Stock Exchange		
Major Products	Traditional Chinese medicine and cosmetic		
Restructuring Process			
	Date	Milestone	Share Price (RMB)
Start of restructuring (D0)	2005-10-15	<ul style="list-style-type: none">Share structure reform announced;Non-tradable and tradable shareholders held 64.19% (state-owned) and 35.81% of total shares respectively.	20.38
First trading suspension period	2005-10-17	<ul style="list-style-type: none">Share trading suspended;Draft reform plan published;Non-tradable shareholders pay tradable shareholders 0.22 shares for every share held by tradable shareholders.	
	2005-10-26	<ul style="list-style-type: none">Revised reform plan confirmed;Non-tradable shareholders pay tradable shareholders 0.25 shares for every share held by tradable shareholders.	
D1	2005-10-27	<ul style="list-style-type: none">Share trading resumed	19.90
D2	2005-11-10	<ul style="list-style-type: none">Rights of receiving the bonus shares recorded	19.92
Second trading suspension period	2005-11-11	<ul style="list-style-type: none">Share trading suspended	
	2005-11-18	<ul style="list-style-type: none">Online voting starting	
	2005-11-22	<ul style="list-style-type: none">Online voting ending	
	2005-11-25	<ul style="list-style-type: none">Plan implemented;Non-tradable and tradable shareholders held 55.24% (state-owned) and 44.76% of total shares	
End of restructuring (D3)	2005-11-30	<ul style="list-style-type: none">Share trading resumed;All shares held by tradable shareholders, including the bonus shares received, can be traded freely;All shares held by non-tradable shareholders can be traded only after 1, 2, or 3 years.	15.40

Table 1.2: Progress of the Share Structure Reform

A total of 509 firms initiated their share restructuring process in the first 21 batches after the China Securities Regulatory Commission announced the Share Structure Reform on April 29 2005. This table reports the date of announcing the start of the reform for firms in a batch, the number of firms in a batch, the number of firms that completed restructuring before the end of March 2006, the number of firms that completed restructuring before the end of March 2006 and adopted a consideration plan that includes only bonus shares from non-tradable-share owners to tradable-share owners, the shortest and longest number of days between announcement and completion by firms in the same batch.

Batch	Announcement Date	# of Firms in the batch	# of Firms Completed	# of Firms Completed and Paid only Bonus Shares	Shortest # of days between Announcement and Completion	Longest # of days between Announcement and Completion
1	2005-05-09	4	4	2	50	81
2	2005-06-19	42	42	34	45	80
3	2005-09-12	40	40	34	39	77
4	2005-09-18	38	38	34	38	72
5	2005-09-26	21	21	18	39	56
6	2005-10-10	21	21	18	38	66
7	2005-10-16	21	21	18	44	73
8	2005-10-24	18	18	14	42	81
9	2005-10-31	18	18	10	45	84
10	2005-11-06	20	20	17	42	73
11	2005-11-13	20	20	19	38	70
12	2005-11-20	17	17	14	38	88
13	2005-11-27	22	20	15	42	87
14	2005-12-04	19	19	15	42	73
15	2005-12-11	21	20	17	39	81
16	2005-12-18	27	27	22	36	80
17	2005-12-22	38	37	29	46	89
18	2005-12-31	19	15	12	44	74
19	2006-01-08	13	12	9	43	67
20	2006-01-15	24	17	11	43	53
21	2006-01-22	46	31	22	39	59
Total		509	478	384		

Table 1.3: Descriptive statistics

Our sample consists of 309 firms that satisfied three requirements: 1) the firm completed share restructuring before March 25 2006, 2) the firm used only bonus shares in the consideration plan, and 3) we can obtain data for all the following variables. Share Price (in RMB) is the closing price on April 28 2005, the day before CSRC announced the plan to reform split-share structure. Trading Volume (in million RMB) is the average daily dollar volume for the one-year period before April 29 2005. Market Capitalization (in million RMB) is equal to the closing price on April 28 2005 multiplied by the number of tradable A-shares before share restructuring. Tradable Proportion is the proportion of tradable A-shares to the total number of A-shares before share restructuring. Bonus Ratio is the number of shares paid by non-tradable shareholders for each tradable share. Price Premium of Tradable Shares is the price difference between tradable shares and non-tradable shares scaled by the price of non-tradable shares, which is computed according to Equation (1). Return on Equity (ROE) and Return on Assets (ROA) are for the fiscal year ending on December 31, 2004. Percentage of Zero Returns equals the percentage of zero return trading days in the one-year period before April 29 2005. Return Volatility is the standard deviation of daily returns in the one-year period before April 29 2005. We collect data from the official website designated by the CSRC and the Bloomberg data system. This table reports descriptive statistics of these variables.

	# of tradable A-shares (in million)	Tradable Proportion	Bonus ratio	Price Premium	Share Price (in RMB)	Volume (in million RMB)	Market Cap (in million RMB)	ROE	ROA	Percentage of Zero Return Days	Return Volatility
Mean	135.967	34.92%	0.313	0.608	5.567	9.002	731.972	8.48%	4.05%	3.69%	2.39%
Median	99.009	35.59%	0.300	0.576	4.679	5.183	456.500	7.43%	3.41%	3.43%	2.34%
Std. Dev.	120.561	10.30%	0.063	0.203	3.121	10.639	812.319	8.23%	4.61%	1.79%	0.45%
Min.	13.318	7.15%	0.100	0.162	1.720	0.687	87.757	-41.53%	-18.56%	0.42%	0.99%
Q1	63.879	28.50%	0.280	0.483	3.591	2.925	288.215	4.47%	1.76%	2.17%	2.08%
Q3	165.362	40.70%	0.350	0.684	6.566	10.561	822.622	12.11%	6.01%	4.68%	2.68%
Max.	982.800	75.69%	0.500	1.801	27.640	89.011	8055.791	52.97%	42.50%	11.49%	3.70%

Table 1.4: Speculative component in the price premium of tradable shares

This table reports evidence on liquidity premium and speculation component in the price of tradable shares. The Price Premium of tradable shares is, by definition, the price difference between tradable shares and non-tradable shares scaled by the price of non-tradable shares. We calculate the price premium according to Equation (1). We regress the price premium on the following factors: the reciprocal of Share Price, the logarithm of Trading Volume, the logarithm of Market Cap, ROE, ROA, the Percentage of Zero Return Days, and Return Volatility. Share Price (in RMB) is the closing price on April 28 2005, the day before CSRC announced the plan to reform the split-share structure. Trading Volume (in million RMB) is the average daily dollar volume for the one-year period before April 29 2005. Market Capitalization (in million RMB) is equal to the closing price on April 28 2005 multiplied by the number of tradable A-shares before share restructuring. Return on Equity (ROE) and Return on Assets (ROA) are for the fiscal year ending on December 31 2004. Percentage of Zero Return Days equals the percentage of zero return trading days in the one-year period before April 29 2005. Return Volatility is the standard deviation of daily returns in the one-year period before April 29 2005. Our sample consists of 309 firms that completed share restructuring before March 25 2006, paid only bonus shares as a consideration, and have complete data for the above variables. We collect data from the official website designated by the CSRC and the Bloomberg data system. Panel A reports correlation coefficients between these variables and Panel B reports the regression results.

Panel A: Correlation coefficients

	1/Price	Ln (Volume)	Ln (Market Cap)	ROE	ROA	Percentage of Zero Return Days	Return Volatility
Price Premium	0.22 ^a	0.07	0.07	-0.12 ^b	-0.12 ^b	-0.04	0.02
1/Price	1.00	-0.30 ^a	-0.33 ^a	-0.42 ^a	-0.42 ^a	0.38 ^a	0.12 ^b
Ln (Volume)	-0.30 ^a	1.00	0.76 ^a	0.24 ^a	0.26 ^a	-0.35 ^a	0.20 ^a
Ln (Market Cap)	-0.33 ^a	0.76 ^a	1.00	0.28 ^a	0.29 ^a	-0.07	-0.34 ^a
ROE	-0.42 ^a	0.24 ^a	0.28 ^a	1.00	0.86 ^a	-0.06	-0.24 ^a
ROA	-0.42 ^a	0.26 ^a	0.29 ^a	0.86 ^a	1.00	-0.08	-0.23 ^a
Percentage of Zero Return	0.38 ^a	-0.35 ^a	-0.07	-0.06	-0.08	1.00	-0.41 ^a
Volatility	0.12 ^b	0.20 ^a	-0.34 ^a	-0.24 ^a	-0.23 ^a	-0.41 ^a	1.00

^{a b c} , , Correlation is significant at the 0.01, 0.05 and 0.10 levels (2-tailed).

Panel B. Regressions

The dependent variable is the price premium of tradable shares. Because ROE is highly correlated with ROA and Ln(Volume) is highly correlated with Ln(Market Cap), we include them in separate regressions.

Model	1	2	3	4
Intercept	0.22 0.92	-0.19 -0.47	0.20 0.87	-0.21 -0.52
ROE	-0.28 ^b -2.17	-0.24 ^c -1.90		
ROA			-0.41 ^c -1.93	-0.35 ^c -1.69
Return Volatility	-5.74 -1.55	-2.23 -0.62	-5.57 -1.50	-2.06 -0.57
Percentage of Zero-return Days	-1.45 ^b -1.95	-1.58 ^b -2.21	-1.50 ^b -1.99	-1.62 ^b -2.24
1/Price	0.62 ^a 3.28	0.64 ^a 3.31	0.65 ^a 3.36	0.67 ^a 3.38
ln(Volume)	0.03 ^b 2.45		0.03 ^b 2.43	
ln(Market Cap)		0.04 ^b 2.21		0.04 ^b 2.23
Dummy	-0.13 ^a -5.17	-0.13 ^a -4.90	-0.12 ^a -5.05	-0.12 ^a -4.81
Adj. R ²	0.106	0.109	0.104	0.107
# of obs.	309	309	309	309

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 1.5: Inferences from share turnover

This table reports evidence on the impact of share restructuring reform on share turnover. Our sample consists of 309 firms that completed share restructuring before March 25, 2006, paid only bonus shares as a consideration, and have the required data. We measure the change in share turnover as (Average daily turnover after reform) / (Average daily turnover before reform) - 1. Daily turnover is equal to the daily number of A-shares traded divided by the total number of tradable A-shares. The average daily turnover before reform is based on the 30 trading days immediately before April 29, 2005. We choose this pre-reform period because trading after April 29 2005 is likely affected by CSRC's announcement of the reform plan. The average daily turnover after reform is based on the first 30 trading days after the restructured firm completed the reform. We classify "highly speculated firms" as the restructured firms whose average daily dollar volume before the reform are above the median, and "less speculated firms" as the restructured firms whose average daily dollar volume before the reform are below the median. We classify "high liquidity firms" as the restructured firms whose percentage of zero return days before the reform are below the median, and "low liquidity firms" as the restructured firms whose percentage of zero return days before the reform are above the median. We test the difference between highly speculated and less speculated firms by conventional t and Wilcoxon tests. In addition, to overcome the potential correlation among sample observations, we conduct a randomization test using control firms. Section 4.4 gives the details on the randomization test. The last three columns give the 1st, 5th, and 10th percentile of the empirical distribution of the mean (median) difference generated by the randomization test.

		Highly speculated firms	Less speculated firms	Difference	t and Wilcoxon tests	Randomization test		
						1%	5%	10%
Whole sample	# of obs.	154	155					
	Mean	1.295	2.255	-0.960	-4.57 ^a	-0.415	-0.137	0.004
	Median	1.010	1.987	-0.977	-4.70 ^a	-0.349	-0.307	-0.254
High liquidity firms	# of obs.	90	65					
	Mean	1.250	2.133	-0.883	-3.01 ^a	0.116	0.505	0.604
	Median	0.864	1.691	-0.827	-2.94 ^a	-0.329	-0.200	-0.133
Low liquidity firms	# of obs.	64	90					
	Mean	1.358	2.342	-0.984	-3.05 ^a	-1.418	-1.069	-0.926
	Median	1.093	2.122	-1.029	-3.44 ^a	-0.652	-0.439	-0.380

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 1.6: Inferences from trading volume

This table reports evidence on the impact of share restructuring reform on trading volume. Our sample consists of 309 firms that completed share restructuring before March 25, 2006, paid only bonus shares as a consideration, and have the required data. We measure the change in daily dollar volume as (Average daily dollar volume after reform) / (Average daily dollar volume before reform) - 1. The average daily dollar volume before reform is based on the 30 trading days immediately before April 29, 2005. The average daily dollar volume after reform is based on the first 30 trading days after the restructured firm completed the reform. We classify “highly speculated firms” as the restructured firms whose average daily dollar volume before the reform are above the median, and “less speculated firms” as the restructured firms whose average daily dollar volume before the reform are below the median. We classify “high liquidity firms” as the restructured firms whose percentage of zero return days before the reform are below the median, and “low liquidity firms” as the restructured firms whose percentage of zero return days before the reform are above the median. We test the difference between highly speculated and less speculated firms by conventional t and Wilcoxon tests. In addition, to overcome the potential correlation among sample observations, we conduct a randomization test using control firms. Section 4.4 gives the details on the randomization test. The last three columns give the 1st, 5th, and 10th percentile of the empirical distribution of the mean (median) difference generated by the randomization test.

		Highly speculated firms	Less speculated firms	Difference	t and Wilcoxon tests	Randomization test		
						1%	5%	10%
Whole sample	# of obs.	154	155					
	Mean	1.544	2.740	-1.196	-4.17 ^a	-0.421	-0.261	-0.051
	Median	1.130	2.096	-0.966	-4.90 ^a	-0.464	-0.325	-0.276
High liquidity firms	# of obs.	90	65					
	Mean	1.540	2.620	-1.080	-2.81 ^a	-0.001	0.361	0.545
	Median	1.125	1.865	-0.740	-2.79 ^a	-0.402	-0.243	-0.084
Low liquidity firms	# of obs.	64	90					
	Mean	1.549	2.826	-1.277	-2.80 ^a	-1.302	-1.104	-0.924
	Median	1.157	2.363	-1.206	-3.97 ^a	-0.841	-0.619	-0.525

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 1.7: Inferences from stock price

This table reports evidence on the impact of share restructuring reform on price of tradable shares. Our sample consists of 309 firms that completed share restructuring before March 25 2006, paid only bonus shares as a consideration, and have the required data. We measure the price change as (Price of tradable shares after reform) / (Price of tradable shares before reform) -1. Price before reform is the closing price on April 28 2005. Price after reform is the closing price on the first trading day after the completion of share structure reform. We classify “highly speculated firms” as the restructured firms whose average daily dollar volume before the reform are above the median, and “less speculated firms” as the restructured firms whose average daily dollar volume before the reform are below the median. We classify “high liquidity firms” as the restructured firms whose percentage of zero return days before the reform are below the median, and “low liquidity firms” as the restructured firms whose percentage of zero return days before the reform are above the median. We test the difference between highly speculated and less speculated firms by conventional t and Wilcoxon tests. In addition, to overcome the potential correlation among sample observations, we conduct a randomization test using control firms. Section 4.4 gives the details on the randomization test. The last three columns give the 1st, 5th, and 10th percentile of the empirical distribution of the mean (median) difference generated by the randomization test.

		Highly speculated firms	Less speculated firms	Difference	t and Wilcoxon tests	Randomization test		
						1%	5%	10%
Whole sample	# of obs.	154	155					
	Mean	-15.12%	-9.77%	-5.35%	-2.59 ^a	-5.47%	-3.41%	-2.51%
	Median	-17.16%	-12.58%	-4.58%	-2.89 ^a	-7.68%	-5.57%	-4.42%
High liquidity firms	# of obs.	90	65					
	Mean	-14.01%	-8.70%	-5.31%	-1.83 ^c	-7.18%	-4.92%	-3.70%
	Median	-14.54%	-11.81%	-2.73%	-1.90 ^c	-9.14%	-6.73%	-4.72%
Low liquidity firms	# of obs.	64	90					
	Mean	-16.68%	-10.54%	-6.14%	-2.10 ^b	-8.41%	-5.70%	-4.16%
	Median	-19.64%	-13.05%	-6.59%	-2.56 ^a	-9.66%	-7.68%	-6.38%

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 1.8: Inferences from shareholder wealth

This table reports evidence on the impact of share restructuring reform on shareholder wealth. Our sample consists of 309 firms that completed share restructuring before March 25 2006, paid only bonus shares as a consideration, and have the required data. We measure the change in shareholder wealth of a restructured firm by $(\text{Price of tradable shares} \times \text{the total number of tradable shares after reform}) / (\text{Price of tradable shares} \times \text{the total number of tradable shares before reform}) - 1$. The total number of tradable shares after reform is the total number of tradable shares before reform *plus* the bonus shares non-tradable-share owners paid to tradable-share owners. Price of tradable shares before reform is the closing price on April 28 2005. Price after reform is the closing price on the first trading day after the completion of share structure reform. We classify “highly speculated firms” as the restructured firms whose average daily dollar volume before the reform are above the median, and “less speculated firms” as the restructured firms whose average daily dollar volume before the reform are below the median. We classify “high liquidity firms” as the restructured firms whose percentage of zero return days before the reform are below the median, and “low liquidity firms” as the restructured firms whose percentage of zero return days before the reform are above the median. We test the difference between highly speculated and less speculated firms by conventional t and Wilcoxon tests. In addition, to overcome the potential correlation among sample observations, we conduct a randomization test using control firms. Section 4.4 gives the details on the randomization test. The last three columns give the 1st, 5th, and 10th percentile of the empirical distribution of the mean (median) difference generated by the randomization test.

		Highly speculated firms	Less speculated firms	Difference	t and Wilcoxon tests	Randomization test		
						1%	5%	10%
Whole sample	# of obs.	154	155					
	Mean	10.68%	18.91%	-8.23%	-3.07 ^a	-5.47%	-3.41%	-2.51%
	Median	7.83%	15.69%	-7.86%	-3.39 ^a	-7.68%	-5.57%	-4.62%
High liquidity firms	# of obs.	90	65					
	Mean	13.29%	21.07%	-7.78%	-2.02 ^b	-7.18%	-4.92%	-3.70%
	Median	12.07%	16.93%	-4.86%	-2.16 ^b	-9.14%	-6.73%	-4.72%
Low liquidity firms	# of obs.	64	90					
	Mean	7.01%	17.36%	-10.35%	-2.85 ^a	-8.41%	-5.70%	-4.16%
	Median	3.11%	14.37%	-11.26%	-3.09 ^a	-9.66%	-7.68%	-6.78%

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 1.9: Wealth gain and liquidity improvement

This table reports evidence on the relation between shareholder wealth gain and liquidity improvement after share restructuring reform. Our sample consists of 309 firms that completed share restructuring before March 25 2006, paid only bonus shares as a consideration, and have the required data. We measure the change in shareholder wealth of a restructured firm by $(\text{Price of tradable shares} \times \text{the total number of tradable shares after reform}) / (\text{Price of tradable shares} \times \text{the total number of tradable shares before reform}) - 1$. The total number of tradable shares after reform is the total number of tradable shares before reform *plus* the bonus shares non-tradable-share owners paid to tradable-share owners. Price of tradable shares before reform is the closing price on April 28 2005. Price after reform is the closing price on the first trading day after the completion of share structure reform. We regress the change in shareholder wealth on three variables that proxy for the change in liquidity: the change in daily turnover, the change in dollar volume, and the change in the percentage of zero-return days. We need a six-month period to calculate the percentage of zero-return days after the reform. This data requirement reduces our sample size from 309 to 188 in the third regression.

Model	1	2	3
Intercept	0.10 ^a 6.05	0.02 ^a 1.22	0.22 ^a 10.17
Change in Turnover	2.98 ^a 3.31		
Change in Dollar Volume		0.14 ^a 8.63	
Change in Percentage of Zero-Return Days			-2.59 ^a -3.88
ln(Volume)	-0.03 ^b -2.35	0.00 0.21	-0.03 -1.56
Dummy	0.07 1.26	0.07 1.33	0.08 0.93
1/P	0.09 0.60	0.01 0.07	0.61 ^b 2.40
Adj. R ²	.057	0.184	0.115
# of obs.	309	309	188

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 1.10: Impact on the B-share market

A total of 90 Chinese listed firms have issued both A- and B-shares. We exclude 31 of them from our analysis because they do not satisfy our data requirement. Twenty-seven of the remaining 59 firms have completed share restructuring before March 25 2006 and the other 32 have not started the restructuring process.

Panel A reports summary statistics on the change in B-share price and the change in daily B-share turnover of restructured firms and benchmark firms. The change in B-share price for both restructured and benchmark firms is the difference between the post-reform price of March 24 2006 and the pre-reform price of April 28 2005 divided by the pre-reform price. The change in daily B-share turnover is the difference between the post-reform turnover and the pre-reform turnover scaled by the pre-reform turnover. Daily turnover is the ratio of the number of B-shares traded to the total number of B-shares outstanding. The pre-reform turnover is the average of daily turnover over the 30 trading days immediately before April 28 2005, and the post-reform turnover is the average of daily turnover over the 30 trading days immediately after March 24 2006.

Panel B reports summary statistics on the pre- and post-reform B-share discounts of restructured firms and benchmark firms, separately. The B-share discount before reform is the price difference on April 28 2005 between A-shares and B-shares scaled by the B-share price. The B-share discount after reform is the price difference on March 24 2005 between A-share and B-share scaled by the B-share price.

Because these variables are measured over the same time period for all restructured and benchmark firms, they are likely correlated. In order to assess the statistical significance of the difference, we conduct a randomization test to overcome the correlation among sample observations. For example, to test the significance of the mean change in share turnover of restructured firms in Panel A, we randomly sample with replacement from the benchmark firms to construct 200 pseudo samples of size 27 and calculate the mean change in turnover of each pseudo sample. These 200 mean changes constitute an empirical distribution against which the significance of the observed mean change in turnover of the restructured firms can be obtained. Because the 95th percentile of the empirical distribution generated from benchmark firms is only 98.74% in Panel A, the mean change in turnover of the restructured sample is 170% and significantly different from that of the benchmark firms at 5% level.

Panel A. Change in turnover and share price in the B-share market

	Change in turnover			Change in price		
	Restructured	Benchmark	95% percentile	Restructured	Benchmark	95% percentile
# of obs.	27	32		27	32	
Mean	169.69%	73.93%	98.74%	21.90%	10.86%	20.04%
Median	132.12%	53.99%	91.40%	18.86%	6.25%	16.12%
Std. Dev.	229.67%	80.57%		28.67%	28.05%	
Min.	-62.52%	-41.70%		-25.48%	-31.13%	
Q1	29.78%	17.89%		-0.86%	-9.22%	
Q3	229.34%	117.68%		45.86%	30.44%	
Max.	1142.03%	308.54%		77.33%	79.71%	

Panel B. Change in the B-share discount

	Before reform			After reform		
	Restructured	Benchmark	5% percentile	Restructured	Benchmark	5% percentile
# of obs.	27	32		27	32	
Mean	43.79%	43.07%	37.75%	30.31%	43.45%	38.07%
Median	44.73%	44.71%	37.73%	29.32%	42.66%	39.11%
Std. Dev.	14.97%	16.82%		15.99%	16.14%	
Min.	12.58%	4.06%		1.21%	1.38%	
Q1	35.63%	35.30%		17.78%	36.59%	
Q3	57.85%	55.53%		44.34%	57.59%	
Max.	63.95%	68.60%		56.70%	69.50%	

Chapter 2: Strategic Trading by Informed Institutions: Evidence from Chinese Stock Markets

Abstract

The Share Structure Reform in China allows us to investigate how informed institutions trade on their private information and how informed trades move prices in Chinese markets where legal cost of insider trading is not threatening. Holden and Subrahmanyam (1992) model that informed traders trade aggressively to compete for the profits associated with private information. However, Barclay and Warner (1993) and Chakravarty (2001) document that informed traders tend to hide their information in medium-size trades in U.S. market. Due to the strong penalty against insider trading, such stealth-trading is more prevalent in U.S. market when information is from illegal sources. With high-frequency data, we find that institutions do possess private information. They trade on the private information aggressively. The strategic informed trading is more effectively implemented on the stocks with medium institutional holdings. Unlike the stealth-trading observed in U.S. market, Chinese informed institutions trade competitively with large-size trades for sole profit-maximizing purpose. The large-size trades cause the largest cumulative price changes in the days immediately before reform announcements. We attribute such difference to the different law enforcements in U.S. and China.

2.1 Introduction

A fundamental role of financial market is to aggregate information into price through trading. Financial economists are particularly interested to know how informed investors trade on the basis of their private information because their trading behavior affects the informativeness of market prices. Existing studies of the U.S. market document evidence that informed investors concentrate their trades in medium-size category. Barclay and Warner (1993) examine a sample of 108 tender offers between 1981 and 1984 and find that medium-size trades display a disproportionately large cumulative price changes relative to their overall proportion of volume during the pre-tender offer announcement period. Using audit-trail data for a sample of NYSE firms, Chakravarty (2001) show that medium-size trades are associated with the highest cumulative stock price change (about 79%) across all trade sizes. Upon further decomposition of trades into those initiated by institutions and by individuals, he finds that almost all of the 79% cumulative stock price change is associated with medium-size trades initiated by institutions, which implies that institutions are informed traders.

In cases where private information is from illegal sources, medium-size trades are more prevalent. Cornell and Sirri (1992) and Meulbroek (1992) document trades by insiders who are later prosecuted for illegal trading prior to tender-offer announcements. Cornell and Sirri (1992) study an insider trading prosecution that involves 38 traders. Their data show that 78.2% of the insider trades are of medium size, compared with only 38.4% of all trades in the same stock. For a large sample of firms with insider trading prosecutions, Meulbroek (1992) reports that the median daily insider share accumulation

represents 11.3% of total volume, corresponding to roughly 2,000 shares for a typical NYSE firm in 1984. Most trades in her sample fall in the medium-size category.

It is often said that trading in medium size is consistent with the theory in Kyle (1985). In a multi-period model of a single informed trader, Kyle (1985) shows that the trader trades in a gradual manner so that his information is incorporated into prices at a slow rate. However, several theoretical models predict more aggressive trading by informed investors. For example, in a multi-period model with multiple informed traders who have common information, Holden and Subrahmanyam (1992) find that informed traders will compete aggressively and cause most of their common private information to be revealed very rapidly. In a more general model, Foster and Viswanathan (1996) allow multiple informed traders to have heterogeneous information. They find that the trading strategy of informed traders depends on the correlation of informed traders' information signals. When the initial correlation is high, there is an incentive to compete aggressively. However, with low initial correlation, there is also an incentive to postpone trades.¹⁸

In U.S., the law enforcement against insider trading is very strong. Meulbroeck (1992) report that during 1980-1989, the Securities and Exchange Commission brought charges against 464 individuals involved in 183 insider trading episodes. In China, trading on insider information is also illegal. The China Securities Regulatory Commission (CSRC) was formed in 1992 to regulate the securities markets in China. In a public release on September 6 2005, the CSRC reported that during 1992 to June 2005, it uncovered only 7 insider trading cases. Apparently, the China regulators are less active in taking actions against insider trading. According to the theory in Holden and

¹⁸ Back et al. (2000) develop a continuous time version of Foster and Viswanathan (1996) and show that the theoretical implications in the continuous time framework are essentially the same as in discrete time framework.

Subrahmanyam (1992) and Foster and Viswanathan (1996), if an agent receives insider information and is afraid that other agents may have the same information, he will trade aggressively to maximize profits. In U.S., a high probability of being caught for illegal insider trading is likely to force the agent to trade stealthily. Whereas, in China, the probability of a law suit against insider trading is so small that informed investors may behave just like a profit-maximizing economic agent. The distinction in law enforcement between U.S. and China may cause different trading strategies of informed investors.

We study the trading behavior of Chinese institutions around a unique event in China. Since April 2005, Chinese listed firms are required by the government to convert their non-tradable shares to tradable shares. We find that one can earn a substantial return by buying shares before a firm announces the start of its restructuring process and selling shares after the firm completes the process. It is thus advantageous to know which firm will start its restructuring process in the next batch -for it represents an opportunity to generate significant profits. According to the government regulation, the list of firms on the next batch is finalized only a few days before the announcement day and must be kept confidential until public release. However, anecdotal evidence in news paper suggests that the list may be leaked out and financial institutions seem to profit from the information. We examine the trading activities of institutions around this period to test whether institutions know this information, and to investigate how institutions trade on this information and the price impact of their trades.

Our main findings are the following. First, in the two days before announcement, institutions buy more shares of the firms on the list than in the normal trading days. It does not seem to be due to random speculation because the control firms do not

experience similar increase in buying activities. Second, institutions trade these firms in large quantities. The cumulative price change due to large-size trades as a proportion to the total price change in a day is significantly higher in the two days before announcement. Institutions trade less aggressively in firms that are mainly held by individuals probably due to the concern over large price impact of their trades. Third, institutions sell shares after the firm completes share restructuring. This is consistent with the profit-taking behavior and these institutions' need for cash to buy stocks of firms that will start the reform process in the next round.

The findings indicate that some Chinese institutions are informed of the list of restructuring firms and trade on the information aggressively in large quantities. This is in contrast to the observation in U.S. that informed investors use medium-size trades. We attribute this difference to the stronger law enforcement against insider trading in U.S.

Other than providing new evidence to the study on informed investors' trading strategy, our paper is also related to the following literature. Firstly, our study complements the researches on insider trading. Lorie and Niederhoffer (1968), Jaffe (1974), Finnerty (1976), and Rozeff and Zaman (1988) investigate the insider transactions listed in the Official Summary of Stock Transactions published by SEC. They find that insiders can earn abnormal returns in the period subsequent to the reporting of their transactions. Wisniewski and Bohl (2005) observe substantially higher returns in the market with lax law enforcement. With a more comprehensive sample of reported insider transactions, Jeng et al. (1999) find that insiders can only earn abnormal returns subsequent to buy transactions; and Lakonishok and Lee (2001) find long-run returns to insiders only in stocks of smaller firms. All these studies claim that insiders

can earn abnormal returns because their transactions are based on inside information. However, they cannot provide direct evidence. Elliott and Morse (1984) and Givoly and Palmon (1985) find that most insider transactions seem to be unrelated to firm-specific information events. They conclude that insiders do not trade on inside information. Unlike the above studies on, by definition, legal insider transactions, our study examines the trades before the release of clearly identified private information in China. We can directly observe the informed transactions on the basis of illegal inside information.

Secondly, our study is related to the researches on institutions' timing ability. Treynor and Mazuy (1966), Henriksson and Merton (1981), Henriksson (1984), Lee and Rahman (1990) and Chen (2006) run nonlinear regressions between funds' returns and functions of contemporaneous market returns to examine whether funds' managers can timely earn profits from future market booming and avoid the losses in future market recessions. Daniel et al. (1997), Wermers (2000), and Jiang et al. (2006) decompose the returns on funds' portfolio holdings to components measuring various abilities of fund managers. Except in a few studies¹⁹ on focused funds, or with conditional returns, fund managers are found lack of timing abilities in most other papers²⁰. "Timing" is characterized, in Admati et al (1985), by the response of informed fund managers to the private information they obtain. Past researches draw conclusions about the existence of timing ability by observing the returns, which are the combined effects of "possessing private information" and "properly responding". Our study can separately investigate

¹⁹ For example, see Ferson and Schadt (1996) with returns conditional on public information; Bollen and Busse (2001) on mutual funds with daily returns; Chen (2006) on hedge funds in bonds, currency and equity markets; Jiang et al (2006) on actively managed US domestic equity funds; Chen and Liang (2006) on market timing hedge funds.

²⁰ For example, see Henriksson (1984) on open-end funds; Lee and Rahman (1990) on mutual funds; Graham and Campbell (1996) on newsletter strategies; Blake et al (1999) on UK pension funds; Coggin et al (1993) on US equity pension funds.

whether institutions have private information and whether they respond to the information properly. In addition, the private information in our study is illegal information before it is released to the public.

The rest of the paper is organized as follows. Section 2.2 introduces the institutional background in China and develops our research hypotheses. Section 2.3 describes our data and methodology. Section 2.4 presents our empirical results. Section 2.5 summarizes and concludes the paper.

2.2 Institutional background and hypothesis development

2.2.1 Institutional background

Prior to April 2005, only one third of the shares issued by exchange-listed companies in China are publicly tradable. The other two thirds, primarily owned by Chinese government agencies or government-linked enterprises, are prohibited from public trading. This split share structure is the result of partial privatization of state-owned enterprises (SOE) by Chinese government. Chinese government started the SOE reform in 1978 by allowing employees and domestic institutions to own shares of SOEs. Because of the desire to conform to the communist public ownership principle, Chinese government kept the majority of shares under direct or indirect state control and disallow these shares from public trading. These shares are known as state shares or legal-person shares. China established the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) in December 1990 and April 1991, respectively, to facilitate public

trading of tradable shares. Only 14 firms were listed on both exchanges at the end of 1991. As of April 2005, 1353 firms list their shares on these two exchanges, the total market value of tradable shares equal to RMB 987 billion.

On April 29 2005, Chinese government announced a reform plan that aims to abolish the split share structure by converting all non-tradable shares to be publicly tradable. An important feature of this reform plan is that non-tradable-share owners are required to pay a consideration to tradable-share owners before their shares become tradable. All companies are required to carry out the reforms and the reforms are announced to start in batches almost every week. Detailed procedures before reform announcements are very important for us to understand the nature of the information and how the information is obtained by institutions. We explain this procedure in detail based on the governmental regulation.

According to Chapter 2 of *“Management of the Share Structure Reform of Listed Companies”* published by CSRC on September 4, 2005, four steps need to be completed before the announcements of every batch of reforms.

Firstly, the intention to reform is proposed by non-tradable shareholders who hold aggregately at least two thirds of all non-tradable shares. Non-tradable shareholders must inform board of directors in writing about their intention and delegate them to work on the reform.

Secondly, after receiving the written delegation letter from non-tradable shareholders, board of directors should hire a sponsor to help draft the reform plan and issue sponsor views. The board should also hire a law agency to examine the regulations with the reform and issue legal views. Meanwhile, all parties involved in the reform plan

drafting, including board of directors, non-tradable shareholders, the sponsor and the law agency, are required to keep the plan confidential until the reform is announced and the plan is published.

Thirdly, the sponsor, delegated by the board, should consult with the stock exchange regarding the technical feasibility of the reform plan and the schedule of the reform. Stock exchanges play the role of deciding which firms are in the next batch of reforms, and fixing the time of shareholders' meetings.

Lastly, according to the schedule arranged with the exchange, the board announces to hold shareholder meeting, publishes reform plan, independent director views, sponsor views and legal views, and applies for the stock suspension. The share structure reform starts. Since the reforms are scheduled by stock exchanges, they can ensure that the reforms start in batches every week as we observe. Stock exchanges also do some necessary announcements about the reforms.

From the above description about the steps before reform announcements, we can find some important facts that are closely related to the motivation of this paper. All parties involved in the reform plan drafting are required to keep the plan confidential before the reform announcements. Therefore, the information about which firms are on the list of reforms in the next batch is private before the announcement. However, this information may leak to institutions via some private channels, e.g. private talks between fund managers and company directors. One of our tasks in the following sections is to test whether institutions can obtain the private information before the announcements of next batch of reforms.

2.2.2 Hypothesis development

Existing studies document evidence that institutions have professional resources and advantage to obtain private information. Chakravarty (2001) finds that most of the cumulative stock price change is associated with medium-size trades initiated by institutions, which implies that institutions are informed traders. El-Gazzar (1998) argues that institutions have strong incentives to search for private pre-disclosure information about companies in their portfolios. Institutions' mining of pre-disclosure information explains the negative relationship between the market price response to the earnings announcements and the institutional holdings. Ke and Petroni (2004) show that transient institutions (i.e., institutions that trade actively to maximize short-term profits) predict the break in a string of consecutive quarterly earnings increases at least one quarter in advance of the break quarter. Hribar et al (2005) find that transient institutions are able to forecast earnings restatements and significantly reduce their holdings in a restating firm at least one quarter prior to the quarter of the restatement. Ali et al. (2004) document that the change in institutional ownership of a company during a calendar quarter is positively associated with the three-day abnormal returns at the time of the subsequent announcement of the company's quarterly earnings.

Our analysis shows that investors who buy shares of restructured firms at the closing price on the last day before the initiation of the restructuring process and sell the shares at the closing price on the first day after the restructuring process is completed will gain, on average, a return of 10% on such a round-trip transaction. If Chinese institutions know the list of upcoming reform firms and foresee the potential profits of buying these

firms' shares, we expect they will buy shares of the restructured firms in the days before the reform. We hypothesize that:

Hypothesis 1: *In the days immediately before reform announcements, institutions buy significantly more shares of these firms than they normally do.*

If institutions know which firms will be on the upcoming list, they will be able to buy shares of these target firms. Otherwise, they may have to guess and spread their investment on shares of similar firms. We study whether institutions possess private information by comparing the institutions' trading activities on restructured firms in the days before the reform announcements with those on control firms in the same days. If institutions possess private information about next batch of reform firms, we expect to see they trade differently on firms that will be announced to start reforms soon, from control firms in the same days. Control firms are in the same industry as the restructured firm, have the closest market capitalizations and have not started reforms yet. We have the following hypothesis to address this task.

Hypothesis 2: *Institutions trade shares of restructured firms in the days before reform announcements significantly differently from their trading behavior on control firms during the same period.*

While institutions trade to profit from this opportunity, some have to be on the other side of the trade. Although not every institution knows the list of the upcoming

firms, we expect that other institutions can tell the information from observing the trades by informed institutions. Therefore the informed institutions may not be able to acquire shares from other institutions. The net buys of institutions before reforms are expected to be less significant for firms most heavily held by institutions. The best way to acquire shares is from individuals.

At the same time, institutions tend to avoid stocks that their trading will have a big price impact, i.e. stocks of low depth and high transaction cost. In the model of Kyle (1985), market depth refers to the ability of the market to absorb quantities without having a large effect on price. It is one of the important conditions of market liquidity. With the measure of depth developed by Glosten and Harris (1988), Brennan and Subrahmanyam (1998) find that investors tend to lower down their trade size on stocks of lower depth. Ke and Ramalingegowda (2005) find that market depth and indirect cost reduce institutions' arbitrage activities around earnings announcements. Therefore, we expect that institutions will be less likely to trade on the stocks with low depth.

To study the effects of the above two factors on institutions' informed trading, we split the whole sample into three groups with different prior-reform aggregate institutional holdings. According to Falkenstein (1996), we expect that the stocks with least institutional holding are small stocks with lowest prices. Institutions' trades on these stocks are more likely to have large impacts on prices due to the low market depth. Therefore, institutions' informed trades tend to avoid stocks with most or least institutional holding. We hypothesize that:

Hypothesis 3: *Institutions trade most actively on stocks with medium institutional holdings than on other stocks.*

The events provide a unique opportunity to study how Chinese institutions trade on their private information and how their trading impacts the stock prices. Evidence in U.S. market conforms to the stealth trading hypothesis proposed by Barclay and Warner (1993). They argue that informed traders are unlikely to use small-size trades because the profit potential from these positions is small, and they are also unlikely to use large-size trades because large-size trades reveal too much information to the market and may suffer from the need to give price concessions.

On the other hand, several theoretical models predict more aggressive trading by informed investors. For example, in a multiperiod model with multiple informed traders who have common information, Holden and Subrahmanyam (1992) find that informed traders will compete aggressively and cause most of their common private information to be revealed very rapidly. In more general models, Foster and Viswanathan (1996) and Back et al. (2000) allow multiple informed traders to have heterogeneous information. They find that the trading strategy of informed traders depends on the correlation of the informed traders' information signals. When the initial correlation is high, there is an incentive to compete aggressively.

In our study, institutions obtain private information from illegal sources. In U.S. market, Meulbroek (1992) and Cornell and Sirri (1992) document trades by insiders who are later prosecuted for illegal trading prior to tender-offer announcements. Both studies

find that the majority of the insider trades are of medium size.²¹ However, the U.S. evidence may not apply to Chinese markets. Law enforcement against insider trading is less strong in China. The China Securities Regulatory Commission (CSRC) was formed in 1992 to regulate the securities markets in China. In a public release on September 6 2005, the CSRC reported that during 1992 to June 2005, it uncovered only 7 insider trading cases. It suggests that informed investors may use large-size trades in Chinese markets and large-size trades may impact the price more. Therefore, we hypothesize the following.

Hypothesis 4: *Institutions trade aggressively and large-size trades are associated with disproportionately high cumulative price changes.*

Institutions must sell the shares of restructured firms in order to realize profit from the transaction. Selling shares also allows them to replenish their cash inventory so as to buy shares of other upcoming reform firms. Therefore, we have the following hypothesis.

Hypothesis 5: *After the share structure reforms complete, institutions will sell shares of firms that have completed the restructuring.*

²¹ In U.S., illegal insider trading is closely watched and heavily penalized. Under the Insider Trading and Securities Fraud Enforcement Act of 1988, charges against insider trading may bring the maximum fine of \$1,000,000 and the maximum jail term of 10 years. Refer to Meulbroek (1992) for more details.

2.3 Data sources and methodology

2.3.1 Data sources

The intraday trading data are organized and provided by SinoFin Financial Information Service²², who acquires the transaction information from Shanghai and Shenzhen Stock Exchanges. Transactions in the two exchanges are order-driven without market maker or specialist. Two types of orders, market or limit order, can be submitted via phones or computer systems by investors to their brokerage firms. These orders from various brokerage firms are channeled to exchanges to engage in the price auction. The exchanges adopt a centralized computerized order matching system to execute these orders. The trade directions are indicated by the exchanges. Trades in which buyer actively increases the bid price to hit the ask price are identified to be buy trades. Trades in which seller actively decreases the ask price to hit the bid price are identified to be sell trades. We collect trades, with stock code, name, number of shares traded and trading volume, trading direction, trading date and time, and bid and ask prices, between January 1, 2005 and June 30, 2006 for all restructured (309 firms) and control firms (538 firms). This sample of restructured firms is the same as what we use in Chapter 1. Although 509 firms have already started the share structure reforms till March 25, 2006, some firms apply complex plans. Our calculation in the first Chapter can only show that the average shareholder wealth gains associated with these 309 firms are positive. Positive shareholder wealth gains in reforms are the incentives for the institutions' net buying

²² SinoFin Financial Information Service experts at collecting and providing financial data for researches on Chinese issues. The data are maintained by Center of China Economic Research.

activities before reforms. We find five control firms for every restructured firm. Some restructured firms may share one common control firm.

We also use the institutions' holding data. Chinese institutions consist of closed-end and open-end funds, stock transaction brokerage firms, Qualified Foreign Institutional Investors (QFII), insurance companies, financial companies, trust companies and social security funds. Funds industry only developed in China for less than 10 years. The first closed-end fund was introduced in March 1998. There were no open-end funds until October 2001. QFII has an even shorter history. The first QFII was approved to invest in Chinese market in Nov 2002. By December 31, 2005, a total of 34 QFIIs are approved to invest in Chinese market with the investment capital capped at US\$6.8 billion. Despite their short histories in the market, Chinese institutions play an increasingly important role in equity market. At the end of 2005, totally 52 management firms were managing 218 funds, 54 closed-end funds with assets amounting to RMB 82.2 billion and 164 open-end funds with assets amounting to RMB 386.9 billion. We collect the proportion of shares of every stock held by every institution to the total tradable shares outstanding, and the number of shares and amount held from the WIND database²³. For every stock, we collect the half-year-end holdings by all institutions from December 31, 2004 to December 31, 2005²⁴.

We collect the information about share restructuring from the information disclosure website officially designated by the China Securities Regulatory

²³ WIND database is also a comprehensive financial database used by 80% of financial institutions in China and many research institutions. It is also being used by some regulatory governmental departments and some famous international financial institutions, including Goldman Sachs, Merrill Lynch.

²⁴ In China, every institutional investor is required to disclose the top ten stocks most heavily held at the end of the first and third quarters. The whole portfolio with all stocks included is available only at half-year-end.

Commission²⁵. We also collect profitability measures such as the return on equity (ROE) and the return on assets (ROA) from the same website for the fiscal year ending on December 31, 2004. We obtain daily stock prices and daily trading volume from the Bloomberg system.

2.3.2 Methodology

This section describes our measures of institutions' and individuals' trading behaviors around reforms. Following the literature, we identify the trader type with trade size proxies. Two types of trade-size proxies have been used in prior studies: dollar-based cutoffs proposed by Lee (1992) and share-based cutoffs proposed and used by Cready (1988) and Cready and Mynatt (1991). With TORQ data²⁶, Lee and Radhakrishna (2000) suggest that the dollar-based cutoffs have greater discriminatory power. They also suggest that misclassifications can be reduced by using a buffer zone of medium-size trades, and that classification accuracy can be further enhanced by conditioning the cutoff values on firm size. In studying the trading behavior of Chinese institutions, Xu (2004) documents that tradable shares outstanding and stock price may impact the trade size proxies. A trade of 10,000 shares may be large and more likely to be initiated by institutions for a stock with only 50 million shares outstanding; but may be small and more likely to be initiated by individuals for a stock with 2 billion shares outstanding. Investors also need to pay more for stocks with higher prices. We use the methods in Xu (2004) to find the cutoff values.

²⁵ The URL of the website is <http://www.cninfo.com.cn>.

²⁶ The TORQ dataset contains trades, quotes, order processing, and audit trail data for a sample of 144 NYSE stocks for the three months from November 1990 through January 1991. The trader type is indicated in the dataset.

The medians of the number of shares outstanding and stock prices on April 28, 2005 are about 0.1 billion and RMB 5.5 respectively. Table 2.1 reports the mean and median trade sizes across all trades in March 2005²⁷ for four sub-samples classified by the number of shares outstanding and stock prices. We can see that the mean and median trade sizes for the sub-sample with the largest number of shares outstanding and the highest stock prices are larger than those for the sub-sample with the smallest number of shares outstanding and the lowest stock prices. Table 2.1 reports the cutoff values for the four sub-samples in the last two columns. For stocks with over 0.1 billion shares outstanding and over RMB 5.5 share price, trades with volume higher than RMB 100,000 are identified to be initiated by institutions; those with volume lower than RMB 1,800 are identified to be initiated by individuals. For the other three sub-samples, the two cutoffs are adjusted slightly downward to be in accordance with the mean (median) trade sizes. All the four cutoffs for institutional trades are between 90th and 95th percentiles of trade sizes across the specific sub-samples they belong to. The four cutoffs for individual trades are between 5th and 10th percentiles respectively.²⁸

Six groups of variables are used to measure the institutions' and individuals' trading behaviors around reforms. We use the sub-sample with over 0.1 billion shares outstanding and over RMB 5.5 share price to interpret our variable definitions. In all definitions, institutional buy (sell) trades represent the buy (sell) trades with volume higher than RMB 100,000. Individual buy (sell) trades represent the buy (sell) trades

²⁷ The high-frequency data are provided in months. We are not able to combine the trades for all months in one file which will be too large. We examine only the trade size for March 2005, the month before the month of the reform announcement by CSRC.

²⁸ To examine the robustness of our results, we choose a set of new cutoff values and replicate our analysis. The new cutoff value is RMB85,000 for the trades initiated by institutions and RMB1,650 for the trades initiated by individuals. The new results are similar to what we find in Tables 2.2, 2.3 and 2.4. The new results are available upon request.

with volume lower than RMB 1,800. All variables are calculated for every stock in every day.

- *Number of buy (sell) trades and net trades*

We find number of institutional and individual buy (sell) trades firstly. Number of institutional (individual) net trades is defined as the difference between number of institutional (individual) buy trades and number of institutional (individual) sell trades.

- *Number of shares bought (sold) and net traded shares*

Number of shares bought (sold) by institutions is defined as the summed number of shares in buy (sell) trades initiated by institutions. Number of shares bought (sold) by individuals is defined as the summed number of shares in buy (sell) trades initiated by individuals. Number of institutional (individual) net traded shares is defined as the difference between number of shares bought by institutions (individuals) and number of shares sold by institutions (individuals).

- *Buy (sell) volume and net volume*

Institutional buy (sell) volume is defined as the summed dollar volume in buy (sell) trades initiated by institutions. Individual buy (sell) volume is defined as the summed dollar volume in buy (sell) trades initiated by individuals. Institutional (individual) net volume is defined as the difference between institutional (individual) buy volume and institutional (individual) sell volume.

- *Percentage number of buy (sell) trades and percentage number of net trades*

Percentage number of institutional buy (sell) trades is defined as the ratio of number of institutional buy (sell) trades to the total number of trades in a whole day. Percentage number of individual buy (sell) trades is defined as the ratio of number of

individual buy (sell) trades to the total number of trades in a whole day. Percentage number of institutional (individual) net trades is defined as the difference between percentage number of institutional (individual) buy trades and percentage number of institutional (individual) sell trades.

- *Percentage number of shares bought (sold) and number of net traded shares*

Percentage number of shares bought (sold) by institutions is defined as the ratio of number of shares bought (sold) by institutions to the total number of shares traded in a whole day. Percentage number of shares bought (sold) by individuals is defined as the ratio of number of shares bought (sold) by individuals to the total number of shares traded in a whole day. Percentage number of institutional (individual) net traded shares is defined as the difference between percentage number of shares bought by institutions (individuals) and percentage number of shares sold by institutions (individuals).

- *Percentage buy (sell) volume and percentage net volume*

Percentage institutional buy (sell) volume is defined as the ratio of institutional buy (sell) volume to the total trading volume in a whole day. Percentage individual buy (sell) volume is defined as the ratio of individual buy (sell) volume to the total trading volume in a whole day. Percentage institutional (individual) net volume is defined as the difference between the percentage institutional (individual) buy volume and institutional (individual) sell volume.

2.4 Empirical results

2.4.1 Trades before reforms across all restructured firms

This section studies the institutional and individual trading activities before reform announcements of all restructured firms. For every firm, we define the event window $(-15, -1)$ as 15 active trading days immediately before the reform is announced. We firstly examine the trading activities graphically. If institutions' trades are informed, we expect to find more institutional buying activities in days immediately before the reforms start. For every day, the percentage number of trades, percentage number of shares traded and percentage trading volume are averaged across all restructured firms. Figure 2.1 and Figure 2.2 plots these averages versus the days in the event window $(-15, -1)$ for both institutional and individual trades²⁹.

The first graph in Figure 2.1 displays the pattern of the percentage number of institutional buy trades, sell trades and net trades. In the days within event window $(-15, -3)$, the bars for number of net trades is either very close to or below zero. In contrast, we can observe significant excess buy trades over sell trades in event window $(-2, -1)$. The second and third graphs in Figure 2.1 display the patterns of the percentage number of shares bought (sold and net traded) and the percentage buy (sell and net trading) volume. The number of shares bought and the buy volume in the two day immediately before reforms are substantially larger than the number of shares sold and the sell volume. In event window $(-15, -3)$, the percentage number of shares net traded by institutions and the percentage net trading volume are basically negative. The findings in the three graphs are consistent with our Hypothesis 1.

²⁹ We also plot the aggregate number of buy trades (sell and net trades), number of shares bought (sold and net traded) and buy (sell and net trading) volume versus days in the event window. The patterns are basically the same.

The three graphs in Figure 2.2 show individuals' buying and selling activities before reforms. We can observe from the first graph that the bars about number of net trades are evidently below the zero reference line in window (-2, -1). The same pattern can be observed in the second and third graphs about the percentage number of shares traded by individuals and percentage trading volume. Individuals' trading patterns in window (-2, -1) are completely different from institution's in the same event window.

In Table 2.2 and Table 2.3, we statistically test whether institutions are buying more shares immediately before reform announcements than they do in normal trading days. If average institutions have private information about which firms will start reforms soon, we expect to observe statistically significantly more institutional buying activities in window (-2, -1) than in (-15, -3). Firstly we will present evidence about buy and sell trades respectively; and then the net effects of buy and sell trades.

Left-hand side of Panel A in Table 2.2 reports the variables measuring the institutional buying activities before reforms. Means and medians for the 2-day and 13-day averages across all stocks are reported in the first two columns. Means and medians for the differences between 2-day and 13-day averages are also reported. The t test and Wilcoxon test show that all the differences are significant at 1% significance level. It indicates that average institutions buy significantly more shares in the two days immediately before the announcement of reforms than they do in the previous 13 days.

Right-hand side of Panel A in Table 2.2 reports the variables measuring the individual buying activities before reforms. All means of the differences between 2-day and 13-day averages are negatively significant at 1% or 5% significance levels; and all medians of the differences are negatively significant at 1% significance level. Unlike

institutions, individuals are buying significantly fewer shares in the two days before reforms than they do in the previous 13 days.

Left-hand side of Panel B in Table 2.2 reports the variables related to the institutional selling activities before reforms. All medians for the differences between the 2- and 13-day averages are negative, although not very significant. The mean differences in number of sell trades, number of shares sold and sell volume are positively significant; however, correct conclusion cannot be drawn without combining the selling activities in Panel B and buying activities in Panel A. The higher aggregate measures for sell trades in the two days immediately before reform announcements are possibly accompanied by higher aggregate measures for buy trades in the same days because of high volumes in those days. We will study the net effects of buy and sell trades shortly in this section.

Right-hand side of Panel B in Table 2.2 reports measures about individual selling activities before reforms. We observe positive differences between 2-day and 13-day averages of aggregate measures, but negative differences between percentage measures. These contradictions are caused by the especially large institutional trades in the two days immediately before reforms relative to previous 13 days. Although individuals are selling more in aggregate values in the two days, once scaled by the total trades, they become to be selling less in percentage values.

In Panel A of Table 2.2, we find some evidence that institutions are buying more and individuals are buying fewer in the two days before reforms. However, we also observe some mixed evidence in Panel B of Table 2.2 about the sell measures. It is necessary for us to carefully examine the net effects of buy and sell trades. Table 2.3 reports both institutional and individual net trades before reforms.

Left-hand side of Table 2.3 reports the measures for institutional net trades in days before reforms. All the mean and median differences between 2-day and 13-day averages of measures for net trades are positively significant at 1% significance level. It indicates that institutions are aware of the positive gains of holding reform firms and trade timely before the announcement of next batch of reforms. They net buy more shares to exploit the positive gains. Chinese institutions have similar ability in acquiring private information as Chakravarty (2001), Ke and Petroni (2004), Hribar et al (2005) and Ali et al. (2004) document.

Right-hand side of Table 2.3 presents measures for individual net trades before reforms. All the mean and median differences between 2-day and 13-day averages are negatively significant at 1% significance level. Immediately before reforms, average individuals are net selling more shares of firms in the next batch of reforms. Individuals play the role of providing the liquidity to institutions. They do not seem to gain from the wealth appreciation associated with the reforms.

In summary, this section presents the buying, selling and net trading activities by both institutions and individuals before reform announcements. Institutions buy more immediately before the reform announcements than they do in normal days. Although we observe, in aggregate values, institutions are also selling more, the net effects show that they are buying significantly more than selling. Empirical evidence statistically confirms our Hypothesis 1. Institutions' trading activities before reforms are consistent with the argument that they may have private information..

2.4.2 Comparison between trades on restructured and control firms

In Section 2.4.1, we find that institutions are buying more shares in the two days immediately before reforms. The significant institutional buying activities can be due to the private information obtained by institutions. It is also possible that institutions just spread their investment in many similar stocks and wait for the information release. We exclude the latter possibility by comparing the institutions' trading activities on restructured firms with those on control firms. We firstly graphically display the trading patterns on control firms over the same days as restructured firms, as we do in Section 2.4.1. Then we statistically compare the trades on restructured firms with those on control firms.

For every restructured firm, we find five control firms which are in the same industry as the restructured firm, have the closest market capitalizations and have not started reforms yet. The six groups of measures defined in Section 2.3.2 are computed for all the five control firms in days before the reform announcement of corresponding restructured firm. We then take averages on the measures of institutional (individual) buy trades, sell trades, and net trades across all these control firms. The averages across five control firms may reduce the noise of randomness in selecting the single control firm³⁰. Figure 2.3 and Figure 2.4 plot the average percentage number of trades, the percentage number of shares traded and the percentage trading volume by both institutions and individuals in these control firms.

From the three graphs of Figure 2.3, we cannot observe similar institutional trading pattern in the two days immediately before reforms, as we find in Section 2.4.1

³⁰ For every restructured firm, we also find single control firm in the same industry and with the closest market capitalization. We then plot similar graphs on these control firms. The patterns remain unchanged.

about restructured firms. We either cannot find any particular individual trading pattern in the same two days from Figure 2.4. The distinct trading patterns between restructured and control firms indicate that institutions indeed have the private information about the firms in the next batch of reforms. They trade actively on the information by concentrating their investments in the upcoming reform firms. Figure 2.3 also shows that, in most of the days before reforms, institutions are selling more shares of control firms than buying. This phenomenon is likely to occur because institutions shift their investments from other firms to upcoming reform firms.

Before we draw statistical inferences about the trades on restructured and control firms, we need to take care of the “clustering” problem in event studies, i.e. the overlapped event windows across stock observations. Bernard (1987) and MacKinlay (1997) address the negative effect of cross-sectional dependence caused by clustering on statistical inference. Randomization approach is useful in solving this problem³¹. In our study, reforms are announced to start in batches every week. “Clustering” problem also exists since the event days for the same batch of firms are exactly the same. To solve this problem, for every restructured firm, we randomly select one control firm from the five control firms to construct a randomized control sample. We then compute the means and medians of the differences between 2-day and 13-day averages of net trades traded by institutions and individuals across these control firms. Such a random-selection process is repeated 200 times to simulate the distribution of these means and medians.

³¹ Bernard (1987) argues that statistics within event periods can be compared with distributions of statistics generated from randomly selected nonevent periods to form a basis for a significance test. This methodology was also used in Noreen and Sepe (1981) and Lys (1984). We can use this approach to compare the trades on restructured firms to those on control firms.

Panel A of Table 2.4 shows the evidence about the comparison between institutional trades on restructured and control firms. The first column reports the differences between 2-day and 13-day averages of net trades traded by institutions on restructured firms. The last five columns report the information about the distribution for means and medians of differences between 2-day and 13-day averages for randomized control sample. The majority of these differences for restructured firms are larger than 99th percentiles of the distributions of randomized control samples. Panel B of Table 2.4 presents the evidence about the comparison between individual trades. All the differences between 2-day and 13-day averages on restructured firms are lower than the 1st or 5th percentiles of the distribution of randomized control samples. In the two days before reforms, institutions are net buying more shares of upcoming reform firms than they do to control firms. Individuals are net selling more.

In summary, both graphical and statistical evidences are consistent with the hypothesis that institutions are informed. Consistent with Hypothesis 2, we find that informed institutions trade on stocks of restructured firms differently from those of control firms in the two days immediately before announcements. They can distinguish the firms which will start reforms in the next batch from other firms. Investments are concentrated in these upcoming reform firms, rather than spread among similar firms.

2.4.3 Two factors that may affect strategic informed trading

This section presents evidence about two factors that may affect strategic informed trading and testify Hypothesis 3. We separate 309 restructured firms into three groups according to the percentage institutional holding at the closest half-year end

before reforms. Table 2.5 presents the characteristics summary for the three groups of stocks. Table 2.6, Table 2.7 and Table 2.8 report measures of net trades traded by both institutions and individuals for groups of stocks with highest, medium, and lowest prior-reform institutional holdings.

Three panels in Table 2.5 summarize the characteristics measures for the three groups of stocks respectively. Return on Equity (ROE) and Return on Assets (ROA) are for the fiscal year ending on December 31, 2004. Share Price (in RMB) is the closing price on April 28, 2005, the day before CSRC announced the plan to reform the split-share structure. Market Capitalization is equal to the closing price on April 28, 2005 multiplied by the number of tradable A-shares before share restructuring. Trading Volume is the average daily dollar volume for the one-year period before April 29, 2005. Past return is equal to the difference between the closing prices on April 28, 2005 and April 29, 2004 scaled by the price on April 29, 2004. Return Volatility is the standard deviation of daily returns in the one-year period before April 29, 2005.

Across stocks with lowest prior-reform institutional holding, institutions only hold averagely 0.05% of all outstanding tradable shares. ROE (ROA), stock price and daily trading volume are the lowest. Market capitalization is the smallest. These stocks perform the worst in the one-year period before April 28, 2005 with lowest past cumulative returns. The stock returns are the most volatile. The characteristic preferences of Chinese institutions are largely consistent with the findings in U.S. market as documented in Falkenstein (1996), Gompers and Metrick (2001), and Japan market as documented in Kang and Stulz (1997). The preferences are also largely consistent with the findings in Ng and Wu (2006).

Left-hand side of Table 2.6 reports the measures for institutional net trades in stocks most heavily held by institutions. In the two days before reforms, although institutions are still net buying more than they do in previous 13 days, such buying activities are much less significant than in the case across all restructured firms in Section 2.4.1. Right-hand side of Table 2.6 reports the measures for individual net trades. In the two days before reforms, individuals are still net selling significantly more shares than they do in previous 13 days. It seems that informed institutions encounter difficulty in buying shares from other uninformed institutions who can learn from the trades of informed ones and place similar buy orders. Although institutions can acquire some shares from individuals, there are not sufficient large sell orders to match these large buy orders.

Left-hand side of Table 2.7 reports the measures for institutional net trades in stocks with medium prior-reform institutional holding. The mean and median differences between 2-day and 13-day averages before reforms are all significant at 1% significance level. The institutions' net buying activities in this group of stocks are the most evident both in magnitude and in statistical significance. The trading behavior of individuals does not change too much. Informed institutions implement their strategy more conveniently in stocks with medium prior-reform institutional holding.

Left-hand side of Table 2.8 reports the measures for institutional net trades in stocks with lowest prior-reform institutional holding. It is interesting to find that institutions' net buying activities before reforms are also less significant than in the case across all restructured firms. Recall that the stocks heavily held by individuals are small-size ones with lowest stock prices. Price concessions in trading small-size stocks are

very large (see Chan and Lakonishok (1995)), especially for large-size trades (see Kraus and Stoll (1972)). Low priced stocks are also known to have greater percentage transaction cost. Informed institutions trade less actively on these stocks because of the large price impact and transaction cost.

In summary, this section examines the trading activities across groups of stocks with different institutional holdings. Consistent with Hypothesis 3, the most effective strategic informed trading is observed in the group with medium prior-reform institutional holding. For the stocks heavily held by institutions, competitions among informed institutions and learning of uninformed institutions substantially restrict the informed buy trades. Informed buy trades are also not active in stocks heavily held by individuals due to the low market depth and high transaction cost of this group of stocks.

2.4.4 Cumulative price changes due to trades of different sizes

In previous sections, institutions are found to possess private information and trade on the information with large-size trades before it is released to the public. Does it mean that the large-size buy trades initiated by institutions before reforms move prices more than the trades in other size categories do? This section provides evidence on the cumulative price changes due to trades of different sizes.

In the 15 days before reforms and 15 days after reforms, all trades are classified into large-size, medium-size and small-size trades. Large-size and small-size trades are defined in the same way as we define the institutional and individual trades in Section 2.3.2. The remaining trades are classified as medium-size trades of one stock in the same day. All trades are sorted according to the time the trades happened. As Charkravarty

(2001) does, we define a stock price change corresponding to a specific trade as the difference between that trade's price and the price of the previous trade. For every stock, the percentage of cumulative price change for trades of a given size category is the sum of all stock price changes occurring on trades in that size category divided by the total cumulative price change in that stock. For every day, the weighted cross-sectional mean of the cumulative stock price change are then estimated where the weights are the absolute value of the cumulative price change of each stock in the sample³².

$$Weighted - PCPC_L = \frac{\sum_{i=1}^n |CPC_i| \cdot PCPC_{L,i}}{|CPC_1| + |CPC_2| + \dots + |CPC_n|}$$

Here, $PCPC_{L,i}$ represents the percentage of cumulative price change for the large-size trades for stock i ; CPC_i denotes the total cumulative price change for stock i . There are n stocks in the whole sample or sub-samples. The weighted means for medium-size and small-size trades are defined in the same way. We also compute the proportion of trade (volume), which is defined as the number of transactions (the sum of volume) in a given size category divided by the total number of trades (the total volume). The mean proportions of trades and volume across the whole sample or sub-samples are then computed. We finally take averages of the weighted mean percentage cumulative price change and mean proportion of trade (volume) across the days in the 2-day and 13-day event windows before reforms.

Table 2.9 reports the cumulative price change by trade sizes for stocks with non-zero price change before reforms. Firstly, we examine the cumulative price change in the

³² Barclay and Warner (1993) address in detail the necessity of weighting to reduce the heteroscedasticity in these percentages.

13 normal trading days before reforms. The contributions of medium-size and large-size trades to the price changes are very close across the whole sample, 51.15% versus 51.98%. Across sub-samples, the contribution of large-size trades increases monotonously with the institutional holdings. For the group with the highest institutional holding, more informed institutions tend to use more large-size trades; therefore the large-size trades contribute the most to the price changes in this group.

Secondly, we compare the 2-day averages with 13-day averages. As the announcement day of next batch of reforms approaches, institutions trade more aggressively with more large-size trades. The 2-day averages of percentage cumulative price change and proportions of trades and volume are substantially larger than the 13-day averages across both the whole sample and sub-samples. In the two days, percentage cumulative price changes due to large-size trades exceed those due to medium-size trades. Institutions do not hide their information. They compete to maximize their profits directly with large-size trades before the information release; therefore the large-size trades carry more information in the two days immediately before reforms.

Lastly, we compare the 2-day averages between three sub-samples. For the sub-sample with lowest institutional holding, the percentage cumulative price change due to large-size trades increases from 37.68% during the 13 normal trading days to 55.56% during the 2 days immediately before reforms (an increase by 17.88%); For the sub-sample with medium (highest) institutional holding, percentage cumulative price change due to large-size trades increase by 32.29% (6.87%). Contribution due to large-size trades increases the most in the sub-sample with medium institutional holding. This finding can be linked to what we find in Section 2.4.3 about the constraints to informed

trading. Informed institutions net buy most actively in large quantities in stocks with medium institutional holding; therefore the cumulative price change due to large-size trades increases the most for this group in the days before reforms.

In summary, consistent with Hypothesis 4, informed institutions are found to trade aggressively in large quantities in the two days immediately before reform announcements. Large-size trades are found to contribute most to the price changes, especially in the sub-sample with medium institutional holding. We do not find evidence of stealth-trading. Although informed institutions are trading with illegal insider information, they do not hide their information in medium-size trades. We attribute this unique finding to the less strong law enforcement in China against illegal insider trading.

2.4.5 Trades after reforms

In previous sections, we investigate institutions' strategic informed trading before reforms. It will also be interesting to know what institutions and individuals are doing after reform plans are implemented.

Panel A of Table 2.10 reports institutional net trades across the whole sample and three sub-samples after the reforms. Averagely across the whole sample, institutions are mainly significantly selling more shares than buying in the 2 days and following 13 days. For the three sub-samples, almost all the 2-day and 13-day averages are negative and most of them are significant at conventional significance levels.

Panel B of Table 2.10 reports individual net trades. Individuals are buying significantly more shares in the days after reforms regardless of the characteristics of stocks. All of the 2-day and 13-day averages are significant at 1% significance level.

Individuals especially buy more shares of stocks with the lowest prior-reform institutional holdings, which can be observed by comparing the magnitude of these 2-day and 13-day averages between sub-samples. We know that these stocks are small illiquid stocks with the worst past performance. Individuals are buying them without any knowledge or concern of the characteristics.

2.5 Conclusion

Barclay and Warner (1993) document the informed investors' stealth trading with medium-size trades. Chakravarty (2001) find that the informed institutions' medium-size trades move prices more. Stealth trading is more prevalent in the cases the private information is illegal (see Meulbroek (1992) and Cornell and Sirri (1992), due to the strong penalty against insider trading in U.S.). Stealth trading is consistent with the model of Kyle (1985), in which the single informed trader in the monopoly position can take advantage of the information gradually over a long horizon. In other models like Holden and Subrahmanyam (1992), Foster and Viswanathan (1996) and Back et al. (2000), informed traders trade aggressively to compete for the profits embedded in the information. Strong law enforcement in U.S. may force these informed traders to trade stealthily with medium-size trades. Our study adds to the literature with some uniqueness of Chinese markets where the law enforcement is less strong and the legal cost of insider trading is not so threatening. With clearly identified information, share structure reform in China provides us a unique opportunity to investigate how institutions trade on their private information and how the trades impact prices.

With high-frequency data, our empirical study addresses our hypotheses properly. Institutions do possess private information. They trade on the basis of private information aggressively. The strategic informed trading is more effectively implemented in the stocks with medium institutional holdings because informed institutions can acquire shares easily and do not need to be concern about the big price impact of their large-size trades. Institutions trade competitively with large-size trades with the sole purpose of maximizing their profits. The large-size trades cause the largest cumulative price changes in the days immediately before reforms.

Reference:

Admati, Anat R., Sudipto Bhattacharya, Paul Pfleiderer and Stephen A. Ross, 1985, On timing and selectivity. *The Journal of Finance* 41, 715-730.

Ali, Ashiq, Cindy Durtschi, Baruch Lev and Mark Trombley, 2004, Changes in institutional ownership and subsequent earnings announcement abnormal returns. *Journal of Accounting, Auditing & Finance* 19, 221-248.

Back, Kerry, C. Henry Cao, and Gregory A. Willard, 2000, Imperfect competition among informed traders. *The Journal of Finance* 55, 2117-2155.

Barclay, Michael J. and Jerold B. Warner, 1993, Stealth trading and volatility: which trades move prices? *Journal of Financial Economics* 34, 281-305.

Bernard, Victor L., 1987, Cross-sectional dependence and problems in inference in market-based accounting research, *Journal of Accounting Research* 25, 1-48.

Bernhardt, Dan and Jianjun Miao, 2004, Informed trading when information becomes stale. *The Journal of Finance* 59, 339-390.

Blake, David, Bruce N. Lehmann and Allan Timmermann, 1999, Asset allocation dynamics and pension fund performance. *The Journal of Business* 72, 429-461.

Bollen, Nicolas P.B. and Jeffrey A. Busse, 2001, On the timing ability of mutual fund managers. *The Journal of Finance* 56, 1075-1094.

Brennan, Michael J. and Avanidhar Subrahmanyam, 1998, The determinants of average trade size. *The Journal of Business* 71, 1-25.

Chakravarty, Sugato, 2001, Stealth-trading: which traders' trades move stock prices? *Journal of Financial Economics* 61, 289-307

Chae, Joon, 2005, Trading volume, information asymmetry, and timing information. *The Journal of Finance* 60, 413-442.

Chan, Louis K.C. and Josef Lakonishok, 1995, The behavior of stock prices around institutional trades. *The Journal of Finance* 50, 1147-1174.

Chen, Yong, 2006, Timing ability in the focus market of hedge funds. *Journal of Investment Management* forthcoming.

Chen, Yong and Bing Liang, 2006, Do market timing hedge funds time the market? *Journal of Financial and Quantitative Analysis* forthcoming.

- Coggin, T. Daniel, Frank J. Fabozzi and Shafiqur Rahman, 1993, The investment performance of U.S. equity pension fund managers: an empirical investigation. *The Journal of Finance* 48, 1039-1055.
- Cornell, B. and Sirri, E., 1992, The reaction of investors and stock prices to insider trading. *The Journal of Finance* 47, 1031-1059.
- Covrig, Vicentiu and Lilian Ng, 2004, Volume autocorrelation, information, and investor trading. *Journal of Banking & Finance* 28, 2155-2174
- Cready, W.M., 1988, Information value and investor wealth: the case of earnings announcements. *Journal of Accounting Research* 26, 1-27.
- Cready, W.M., Mynatt, P.G., 1991, The information content of annual reports: a price and trading response analysis. *Accounting Review* 66, 291-312.
- Daniel, Kent, Mark Grinblatt, Sheridan Titman and Russ Wermers, 1997, Measuring mutual fund performance with characteristic-based benchmarks. *The Journal of Finance* 52, 1035-1058.
- El-Gazzar, Samir M., 1998, Predisclosure information and institutional ownership: a cross-sectional examination of market revaluations during earnings announcement periods. *The Accounting Review* 73, 119-129.
- Elliott, John, Dale-Morse and Gordon Richardson, 1984, The association between insider trading and information announcements. *Rand Journal of Economics* 15, 521-536.
- Falkenstein, Eric G., 1996, Preferences for stock characteristics as revealed by mutual fund portfolio holdings. *The Journal of Finance* 51, 111-135.
- Ferson, Wayne E. and Rudi W. Schadt, 1996, Measuring fund strategy and performance in changing economic conditions. *The Journal of Finance* 51, 425-461.
- Finnerty, Joseph E., 1976, Insiders and market efficiency. *The Journal of Finance* 31, 1141-1148.
- Foster F. Douglas and S. Viswanathan, 1996, Strategic trading when agents forecast the forecasts of others. *The Journal of Finance* 51, 1437-1478.
- Givoly, Dan and Dan Palmon, 1985, Insider trading and the exploitation of insider information: some empirical evidence. *The Journal of Business* 58, 69-87.
- Glosten, Lawrence R. and Harris, Lawrence E., 1988, Estimating the components of the bid/ask spread. *Journal of Financial Economics* 21, 123-142.

Gompers, Paul and Andrew Metrick, 2001, Institutions investors and equity prices. *Quarterly Journal of Economics* 116, 229-259.

Graham, John R. and Campbell R. Harvey, 1996, Market timing ability and volatility implied in investment newsletters' asset allocation recommendations. *Journal of Financial Economics* 42, 397-421.

Henriksson, Roy D., 1984, Market timing and mutual fund performance: an empirical investigation. *The Journal of Business* 57, 73-96.

Henriksson, Roy D. and Robert C. Merton, 1981, On market timing and investment performance. II. statistical procedures for evaluating forecasting skills. *The Journal of Business* 54, 513-533.

Holden, Craig W. and Avanidhar Subrahmanyam, 1992, Long-lived private information, and imperfect competition. *The Journal of Finance* 47, 247-270.

Hong, Harrison, and Sven Rady, 2002, Strategic trading and learning about liquidity. *Journal of Financial Markets* 5, 419-450.

Hribar, Paul, Jenkins, Nicole Thorne and Wang, Juan, 2005, Institutional Investors and Accounting Restatements. AAA 2005 FARS Meeting Paper.

Jaffe, Jeffrey F., 1974, Special information and insider trading, *The Journal of Business* 47, 410-428.

Jeng, Leslie A. and Andrew Metrick, 1999, The profits to insider trading: a performance-evaluation perspective. *NBER Working Paper* No. 6913.

Jiang, George J., Tong Yao and Tong Yu, 2006, Do mutual funds time the market? evidence from portfolio holdings. *Journal of Financial Economics* forthcoming.

Kang, Jun-Koo and Rene M. Stulz, 1997, Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan. *Journal of Financial Economics* 46, 3-28.

Ke, Bin and Kathy Petroni, 2004, How informed are actively trading institutional investors? Evidence from their trading behavior before a break in a string of consecutive earnings increases, *Journal of Accounting Research* 42, 895-927.

Ke, Bin, and Santhosh Ramalingegowda, 2005, Do institutional investors exploit the post-earnings announcement drift? *Journal of Accounting and Economics* 39, 25-53.

Kraus, Alan and Hans Stoll, 1972, Price impacts of block trading on the NYSE. *The Journal of Finance* 27, 569-588.

Kyle, Albert S., 1985, Continuous auctions and insider trading. *Econometrica* 53, 1315-1335.

Lakonishok, Josef and Inmoo Lee, 2001, Are insider trading informative? *The Review of Financial Studies* 14, 79-111.

Lee, Charles M.C., 1992, Earnings news and small traders. *Journal of Accounting and Economics* 15, 265-302.

Lee, Charles M.C. and Balkrishna Radhakrishna, 2000, Inferring investor behavior: Evidence from TORQ data. *Journal of Financial Markets* 3, 83-111.

Lee, Cheng-Few and Shafiqur Rahman, 1990, Market timing, selectivity, and mutual fund performance: an empirical investigation. *The Journal of Business* 63, 261-278.

Lorie, James H. and Victor Niederhoffer, 1968, Predictive and statistical properties of insider trading. *Journal of Law and Economics* 11, 35-53.

Lys, T, 1984, Mandated accounting changes and debt covenants: the case of oil and gas accounting. *Journal of Accounting and Economics*, 39-65.

MacKinlay, Craig A., 1997, Event studies in economics and finance, *Journal of Economic Literature* 35, 13-39.

Mendelson, Haim and Tunay I. Tunca, 2004, Strategic trading, liquidity, and information acquisition. *The Review of Financial Studies* 17, 295-337.

Meulbroek, L., 1992, An empirical analysis of illegal insider trading. *The Journal of Finance* 47, 1661-1699.

Ng, Lilian and Fei Wu, 2006, Revealed stock preferences of individual investors: evidence from Chinese equity markets, *Pacific-Basin Finance Journal* 14, 175-192.

Noreen, E. and J. Sepe, 1981, Market reactions to accounting policy deliberations: the inflation accounting case. *The Accounting Review*, 253-269

Rozeff, Michael S. and Mir A. Zaman, 1988, Market efficiency and insider trading: new evidence. *The Journal of Business* 61, 25-44.

Treynor, Jack L. and Kay K. Mazuy, 1966, Can mutual funds outguess the market? *Harvard Business Review* 44, 131-136.

Wermers, Russ, 2000, Mutual fund performance: an empirical decomposition into stock-picking talent, style, transactions costs, and expenses. *The Journal of Finance* 55, 1655-1695.

Wisniewski, Tomasz P. and Martin T. Bohl, 2005, The information content of registered insider trading under lax law enforcement. *International Review of Law & Economics* 25, 169-185.

Xu, Longbing, 2004, Institutional investors' trading behavior on China stock markets through multi-securities accounts. 10th Joint Research with Shanghai Stock Exchange, in Chinese.

Figure 2.1: Institutional trades on restructured firms before reforms

The figure plots the institutional trading behavior before reforms. For every stock in everyday, percentage number of institutional buy (sell) trades, shares bought (sold) and buy (sell) volume are defined as the ratio of the summed institutional buy (sell) trades to the total number of trades, shares traded and trading volume in a whole day. Number of net trades, number of net traded shares and net volume denote the difference between the summed institutional buy and sell trades. Percentage number of net trades, net traded shares and net volume are defined as the difference between the ratios of the summed institutional buy and sell trades to the total number of trades, shares and volume in a whole day. For every restructured firm, event window (-15, -1) represent 15 days before the reform announcement. We take averages on the measures of institutional buy trades, sell trades, and net trades across all restructured firms. We plot the average percentage number of trades, percentage number of shares traded and percentage trading volume over 15 days before reforms in the following figures.

Figure 2.1 (continued)

Figure 2.2: Individual trades on restructured firms before reforms

The figure plots the individual trading behavior before reforms. For every stock in everyday, percentage number of individual buy (sell) trades, shares bought (sold) and buy (sell) volume are defined as the ratio of the summed individual buy (sell) trades to the total number of trades, shares traded and trading volume in a whole day. Number of net trades, number of net traded shares and net volume denote the difference between the summed individual buy and sell trades. Percentage number of net trades, net traded shares and net volume are defined as the difference between the ratios of the summed individual buy and sell trades to the total number of trades, shares and volume in a whole day. For every restructured firm, event window (-15, -1) represent 15 days before the reform announcement. We take averages on the measures of individual buy trades, sell trades, and net trades across all restructured firms. We plot the average percentage number of trades, percentage number of shares traded and percentage trading volume over 15 days before reforms in the following figures.

Figure 2.2 (continued)

Proportion of Shares Traded by Individuals to Total Shares Traded

Proportion of Individual Dollar Trading Volume to Total Dollar Volume

Figure 2.3: Institutional trades on control firms before reforms

For every stock in everyday, percentage number of institutional buy (sell) trades, shares bought (sold) and buy (sell) volume are defined as the ratio of the summed institutional buy (sell) trades to the total number of trades, shares traded and trading volume in a whole day. Number of net trades, number of net traded shares and net volume denote the difference between the summed institutional buy and sell trades. Percentage number of net trades, net traded shares and net volume are defined as the difference between the ratios of the summed institutional buy and sell trades to the total number of trades, shares and volume in a whole day.

For every restructured firm, we find five control firms which are in the same industry as restructured firms, have the closest market capitalizations and have not started reforms yet. We take averages on the measures of institutional buy trades, sell trades, and net trades across these control firms. We plot the average percentage number of trades, percentage number of shares traded and percentage trading volume over 15 days before reforms in the following figures.

Figure 2.3 (continued)

Figure 2.4: Individual trades on control firms before reforms

For every stock in everyday, percentage number of individual buy (sell) trades, shares bought (sold) and buy (sell) volume are defined as the ratio of the summed individual buy (sell) trades to the total number of trades, shares traded and trading volume in a whole day. Number of net trades, number of net traded shares and net volume denote the difference between the summed individual buy and sell trades. Percentage number of net trades, net traded shares and net volume are defined as the difference between the ratios of the summed individual buy and sell trades to the total number of trades, shares and volume in a whole day.

For every restructured firm, we find five control firms which are in the same industry as restructured firms, have the closest market capitalizations and have not started reforms yet. We take averages on the measures of individual buy trades, sell trades, and net trades across these control firms. We depict the average percentage number of trades, percentage number of shares traded and percentage trading volume over 15 days before reforms in the following figures.

Figure 2.4 (continued)

Table 2.1: Trade size cutoffs for trades initiated by institutions and individuals

We separate the whole sample to four sub-samples by the number of shares outstanding and the share prices on April 28, 2005. Means (medians) of trade sizes are taken across all trades in March, 2005, the month before the month of reform announcement by CSRC. Mean (median) trade sizes and the cutoff values are reported in thousands RMB. For the first sub-sample with number of shares outstanding no less than 0.1 billion and share price no lower than RMB 5.5, trades with volume higher than RMB 100,000 are identified to be initiated by institutions; trades with volume lower than RMB 1,800 are identified to be initiated by individuals. For the other three sub-samples, the two cutoffs are adjusted slightly downward to account for different average trade sizes in different sub-samples.

Sub-sample	# of shares outstanding	Share price	Mean (median) trade size	Cutoff for trades initiated by institutions	Cutoff for trades initiated by individuals
1	≥ 0.1 billion	≥ 5.5	38.52 (12.64)	100	1.8
2	≥ 0.1 billion	< 5.5	21.02 (7.6)	80	1.6
3	< 0.1 billion	≥ 5.5	21.73 (8.46)	90	1.7
4	< 0.1 billion	< 5.5	13.48 (5.86)	70	1.5

Table 2.2: Buy and sell trades for all restructured firms before reforms

Institutional buy or sell trades are defined as those with dollar volume higher than RMB 100,000; and individual buy or sell trades are defined as those with dollar volume lower than RMB 1,800. For every stock in everyday, percentage number of institutional (individual) buy or sell trades, shares bought or sold and buying or selling volume are defined as the ratios of the summed institutional or individual buy and sell trades to the total number of trades, shares traded and dollar volume in a whole day. For every stock, the six groups of variables about the institutional and individual buy or sell trades are averaged across 2 days (day -2 and -1) and 13 days (day -15 to -3) before the reform announcements. The following table reports the means and medians for these averages across all 309 stocks of restructured firms. Shares traded and dollar volumes are reported in thousands. The t test and Wilcoxon median test are applied to compare the 2-day and 13-day averages.

Panel A: Institutional and individual buy trades for the whole sample before reform announcements							
		Institutional investors			Individual investors		
		2-day average	13-day average	Difference	2-day average	13-day average	Difference
# of trades	Mean	17.840	12.455	5.385***	15.688	16.373	-0.685**
	Median	7.000	6.333	0.200***	14.000	14.769	-1.000***
# of shares	Mean	663.38	451.80	211.58***	3.34	3.58	-0.24***
	Median	238.38	198.86	4.58***	2.72	3.00	-0.18***
Volume	Mean	4166.89	2659.19	1507.69***	15.13	15.97	-0.85**
	Median	1067.39	955.77	28.63***	13.44	13.65	-0.95***
Percentage # of trades	Mean	3.11%	2.54%	0.57%***	4.45%	5.03%	-0.58%***
	Median	2.04%	1.80%	0.22%***	4.13%	4.79%	-0.68%***
Percentage # of shares	Mean	18.53%	16.08%	2.44%***	0.29%	0.36%	-0.07%***
	Median	16.60%	13.88%	1.65%***	0.21%	0.29%	-0.05%***
Percentage volume	Mean	18.57%	16.12%	2.45%***	0.29%	0.36%	-0.07%***
	Median	16.66%	13.90%	1.59%***	0.21%	0.29%	-0.05%***
Panel B: Institutional and individual sell trades for the whole sample before reform announcements							
# of trades	Mean	16.456	12.563	3.894***	17.888	16.275	1.613***
	Median	6.500	6.692	-0.423	16.000	15.250	0.654***
# of shares	Mean	573.22	443.33	129.89***	3.86	3.60	0.26***
	Median	191.46	195.29	-19.65	3.13	2.96	0.05**
Volume	Mean	3628.30	2602.99	1025.31***	17.33	15.73	1.61***
	Median	914.94	911.01	-83.22	15.12	13.74	0.45***
Percentage # of trades	Mean	2.85%	2.61%	0.25%***	5.07%	5.10%	-0.03%
	Median	1.90%	1.96%	-0.04%	4.40%	4.75%	-0.14%
Percentage # of shares	Mean	16.67%	17.18%	-0.50%	0.34%	0.36%	-0.02%*
	Median	14.56%	15.06%	-1.11%*	0.24%	0.30%	-0.02%***
Percentage volume	Mean	16.65%	17.15%	-0.50%	0.34%	0.36%	-0.02%*
	Median	14.50%	15.07%	-1.12%*	0.24%	0.30%	-0.02%***

***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively

Table 2.3: Net trades for all restructured firms before reforms

For every stock in everyday, number of institutional or individual net trades (number of net traded shares and net trading volume) denotes the difference between the summed institutional or individual buy and sell trades. Percentage number of institutional or individual net trades, number of net traded shares traded and net volume are defined as the difference between the ratios of the summed institutional or individual buy and sell trades to the total number of trades, shares traded and dollar volume in a whole day. For every stock, the six groups of variables about the institutional or individual net trades are averaged across 2 days (day -2 and -1) and 13 days (day -15 to -3) before the reform announcements. The following table reports the means and medians for these averages across all 309 stocks of restructured firms. Shares traded and dollar volumes are reported in thousands. The t test and Wilcoxon median test are applied to compare the 2-day and 13-day averages.

		Institutional investors			Individual investors		
		2-day average	13-day average	Difference	2-day average	13-day average	Difference
# of net trades	Mean	1.383	-0.108	1.491***	-2.201	0.098	-2.299***
	Median	0.500	-0.152	1.048***	-1.500	0.154	-1.500***
# of net traded shares	Mean	90.16	8.47	81.69***	-0.52	-0.02	-0.50***
	Median	22.67	-1.37	31.41***	-0.20	0.05	-0.29***
Net volume	Mean	538.59	56.21	482.38***	-2.20	0.25	-2.45***
	Median	102.69	0.20	165.25***	-1.42	0.27	-1.43***
Percentage # of net trades	Mean	0.26%	-0.07%	0.32%***	-0.62%	-0.07%	-0.55%***
	Median	0.07%	-0.14%	0.24%***	-0.48%	0.05%	-0.38%***
Percentage # of net traded shares	Mean	1.85%	-1.09%	2.95%***	-0.05%	0.00%	-0.04%***
	Median	1.27%	-1.34%	2.49%***	-0.02%	0.00%	-0.01%***
Percentage net volume	Mean	1.92%	-1.03%	2.95%***	-0.05%	0.00%	-0.04%***
	Median	1.35%	-1.33%	2.45%***	-0.02%	0.00%	-0.01%***

***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively

Table 2.4: Comparison between trades on restructured firms and control firms

This table shows evidence whether institutions possess private information before the announcements of reforms. For every stock in everyday, number of institutional or individual net trades (number of net traded shares and net trading volume) denotes the difference between the summed institutional or individual buy and sell trades. Percentage number of institutional or individual net trades, number of net traded shares traded and net volume are defined as the difference between the ratios of the summed institutional or individual buy and sell trades to the total number of trades, shares traded and dollar volume in a whole day. For every stock, the six groups of variables about the institutional or individual net trades are averaged across 2 days (day -2 and -1) and 13 days (day -15 to -3) before the reform announcements. The means and medians for the differences between the two averages are reported in the first column of the following table. Shares traded and dollar volumes are reported in thousands.

For every restructured firm, we find 5 control firms which are in the same industry as restructured firms, have the closest market capitalizations, and have not started reforms yet. We then randomly select one control firm from the five control firms for every restructured firm to construct a randomized control sample. For every control sample, we compute the means and medians of differences between 2-day and 13-day averages of institutional and individual net traded trades across control firms before reforms of corresponding restructured firms. Such a process is repeated 200 times to simulate the distribution of these means and medians. Percentiles of the distributions are reported. We then compare the means and medians across 309 restructured firms in the first column to the percentiles to testify the significance of these mean and median differences of restructured firms. Panel A displays the comparison for institutional net trades; Panel B displays the comparison for individual net trades.

Panel A: Distribution for mean and median differences between 2-day and 13-day averages of institutional net trades before reform announcements

		For restructured firms	Distribution of means and medians for randomized control samples				
			Average	50 th percentile	90 th percentile	95 th percentile	99 th percentile
Difference in # of net trades	Mean	1.491***	-0.126	-0.134	0.334	0.426	0.703
	Median	1.048***	-0.226	-0.2	-0.027	0	0.114
Difference in # of net traded shares	Mean	81.69***	1.839	3.07	30.99	37.72	47.50
	Median	31.41***	-11.206	-10.999	-1.36	0.94	7.23
Difference in net volume	Mean	482.38***	16.163	10.772	132.85	171.73	224.50
	Median	165.25***	-46.656	-42.664	-7.36	3.98	25.62
Difference in percentage # of net trades	Mean	0.32%**	0.01%	0.01%	0.24%	0.30%	0.47%
	Median	0.24%***	-0.06%	-0.07%	0.03%	0.04%	0.11%
Difference in percentage # of net traded shares	Mean	2.95%***	-0.24%	-0.25%	0.51%	0.75%	1.02%
	Median	2.49%***	-0.24%	-0.15%	0.41%	0.60%	0.99%
Difference in percentage net volume	Mean	2.95%***	-0.24%	-0.26%	0.50%	0.74%	1.01%
	Median	2.45%***	-0.25%	-0.17%	0.46%	0.63%	0.98%

Panel B: Distribution for mean and median differences between 2-day and 13-day averages of individual net trades before reform announcements

		For restructured firms	Distribution of means and medians for randomized control samples				
			Average	50 th	1 st	5 th	10 th
				percentile	percentile	percentile	percentile
Difference in # of net trades	Mean	-2.299***	-0.412	-0.43	-1.34	-1.141	-0.933
	Median	-1.500***	-0.607	-0.595	-1.35	-1.15	-1.08
Difference in # of net traded shares	Mean	-0.50***	-0.118	-0.116	-0.42	-0.36	-0.32
	Median	-0.29***	-0.093	-0.09	-0.27	-0.22	-0.18
Difference in net volume	Mean	-2.45***	-0.299	-0.275	-1.22	-0.91	-0.79
	Median	-1.43***	-0.44	-0.447	-1.17	-0.96	-0.86
Difference in percentage # of net trades	Mean	-0.55%**	-0.25%	-0.25%	-0.62%	-0.54%	-0.45%
	Median	-0.38%**	-0.11%	-0.11%	-0.42%	-0.35%	-0.31%
Difference in percentage # of net traded shares	Mean	-0.04%**	0.08%	0.04%	-0.05%	-0.04%	-0.03%
	Median	-0.01%**	0.00%	0.00%	-0.02%	-0.01%	-0.01%
Difference in percentage net volume	Mean	-0.04%**	0.08%	0.04%	-0.05%	-0.04%	-0.03%
	Median	-0.01%**	0.00%	0.00%	-0.02%	-0.01%	-0.01%

*, **, *** denote larger than 90th, 95th, and 99th percentiles in Panel A;

*, **, *** denote smaller than 10th, 5th, and 1st percentiles in Panel B;

Table 2.5: Characteristics summary for stocks in three sub-samples

We separate the 309 restructured firms into three sub-samples by the percentage institutional holding for the closest half-year end before reforms. For stock i , the percentage institutional holding ($PROP_i$) at half-year end is defined as,

$$PROP_i = \sum_{j=1}^N \frac{Own_{i,j}}{Total_i}$$

Here, $Own_{i,j}$ represents the number of shares of stock i held by institution j . $Total_i$ represents the total number of tradable shares outstanding for stock i . Return on Equity (ROE) and Return on Assets (ROA) are for the fiscal year ending on December 31, 2004. Share Price (in RMB) is the closing price on April 28, 2005, the day before CSRC announced the plan to reform the split-share structure. Market Capitalization is equal to the closing price on April 28, 2005 multiplied by the number of tradable A-shares before share restructuring. Trading Volume is the average daily dollar volume for the one-year period before April 29, 2005. Past return is equal to the difference between the prices on April 28, 2005 and April 29, 2004 scaled by the price on April 29, 2004. Return Volatility is the standard deviation of daily returns in the one-year period before April 29, 2005. Panel A, B and C report the summary information about the characteristics for sub-samples with lowest, medium and highest prior-reform institutional holding.

Panel A: For the sub-sample with lowest institutional holding								
	Holding Percentage	ROE	ROA	Price	ln(Mkt. Cap.)	ln(Volume)	Past Return	Volatility
mean	0.05%	6.16%	2.83%	4.25	19.50	15.02	-39.19%	2.53%
std. Dev.	0.05%	9.06%	4.93%	1.53	0.51	0.69	13.13%	0.45%
median	0.07%	5.67%	2.37%	3.94	19.51	14.99	-40.49%	2.47%
Max.	0.14%	53.00%	42.50%	10.37	21.36	16.81	8.90%	3.70%
Q3	0.10%	9.62%	3.89%	4.90	19.84	15.52	-33.29%	2.83%
Q1	0.00%	3.29%	1.29%	3.24	19.11	14.56	-47.40%	2.19%
Min.	0.00%	-41.50%	-9.70%	1.72	18.29	13.44	-69.40%	1.36%
Panel B: For the sub-sample with medium institutional holding								
mean	1.95%	7.56%	3.52%	4.89	20.10	15.66	-32.53%	2.45%
std. Dev.	1.60%	7.59%	4.10%	1.81	0.67	0.92	18.23%	0.40%
median	1.43%	6.87%	2.98%	4.54	20.08	15.56	-34.44%	2.40%
Max.	5.85%	34.30%	21.40%	10.76	21.78	18.30	79.20%	3.25%
Q3	3.04%	10.29%	5.01%	5.44	20.53	16.26	-26.68%	2.73%
Q1	0.62%	4.10%	1.63%	3.44	19.66	14.96	-43.21%	2.19%
Min.	0.15%	-33.00%	-18.40%	2.39	18.34	13.70	-60.20%	1.40%
Panel C: For the sub-sample with highest institutional holding								
mean	25.54%	11.71%	5.80%	7.56	20.57	15.99	-10.78%	2.20%
std. Dev.	17.31%	6.92%	4.27%	4.19	0.78	0.89	30.70%	0.43%
median	19.60%	10.99%	5.66%	6.72	20.44	15.98	-15.97%	2.14%
Max.	78.38%	31.30%	17.40%	27.64	22.81	17.94	98.90%	3.70%
Q3	36.94%	16.47%	8.07%	9.95	21.19	16.68	6.71%	2.42%
Q1	11.01%	8.03%	3.37%	4.69	19.96	15.34	-31.57%	1.92%
Min.	5.87%	-22.90%	-18.60%	2.37	19.12	13.99	-67.60%	0.99%

Table 2.6: Net trades for the group with highest prior-reform institutional holding before reforms

This table shows evidence about one of the constraints to institutions' strategic informed trading. We separate the 309 restructured firms into three sub-samples by the percentage institutional holding for the closest half-year end before reforms. For stock i , the percentage institutional holding ($PROP_i$) at half-year end is defined as

$$PROP_i = \sum_{j=1}^N \frac{Own_{i,j}}{Total_i}$$

Here, $Own_{i,j}$ represents the number of shares of stock i held by institution j . $Total_i$ represents the total tradable shares outstanding for stock i .

For every stock in everyday, number of institutional or individual net trades (number of net traded shares and net trading volume) denotes the difference between the summed institutional or individual buy and sell trades. Percentage number of institutional or individual net trades, number of net traded shares traded and net volume are defined as the difference between the ratios of the summed institutional or individual buy and sell trades to the total number of trades, shares traded and dollar volume in a whole day. For every stock, the six groups of variables about the institutional or individual net trades are averaged across 2 days (day -2 and -1) and 13 days (day -15 to -3) before the reform announcements. The following table reports the means and medians for these averages across the 103 stocks with the *highest* prior-reform percentage institutional holding. Shares traded and dollar volumes are reported in thousands. The t test and Wilcoxon median test are applied to compare the 2-day and 13-day averages.

		Institutional investors			Individual investors		
		2-day average	13-day average	Difference	2-day average	13-day average	Difference
# of net trades	Mean	1.519	-0.479	1.998**	-1.806	0.790	-2.595***
	Median	0.000	-0.582	0.271*	-1.000	0.077	-1.769***
# of net traded shares	Mean	105.61	12.44	93.17*	-0.35	0.17	-0.52***
	Median	25.69	-5.38	8.66	-0.12	0.08	-0.17***
Net volume	Mean	747.35	102.17	645.17*	-1.81	1.10	-2.90***
	Median	177.23	-7.42	109.68	-1.24	0.52	-1.45***
Percentage # of net trades	Mean	0.31%	-0.06%	0.37%*	-0.45%	-0.03%	-0.43%**
	Median	0.03%	-0.34%	0.06%	-0.24%	0.17%	-0.25%**
Percentage # of net traded shares	Mean	1.64%	-1.01%	2.64%*	-0.03%	0.00%	-0.03%***
	Median	1.27%	-1.67%	1.47%	-0.01%	0.01%	-0.01%**
Percentage net volume	Mean	1.72%	-0.93%	2.65%*	-0.03%	0.00%	-0.03%***
	Median	1.35%	-1.58%	1.48%	-0.01%	0.01%	-0.01%**

***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively

Table 2.7: Net trades for the group with medium prior-reform institutional holding before reforms

This table shows evidence about one of the constraints to institutions' strategic informed trading. We separate the 309 restructured firms into three sub-samples by the percentage institutional holding for the closest half-year end before reforms. For stock i , the percentage institutional holding ($PROP_i$) at half-year end is defined as

$$PROP_i = \sum_{j=1}^N \frac{Own_{i,j}}{Total_i}$$

Here, $Own_{i,j}$ represents the number of shares of stock i held by institution j . $Total_i$ represents the total tradable shares outstanding for stock i .

For every stock in everyday, number of institutional or individual net trades (number of net traded shares and net trading volume) denotes the difference between the summed institutional or individual buy and sell trades. Percentage number of institutional or individual net trades, number of net traded shares traded and net volume are defined as the difference between the ratios of the summed institutional or individual buy and sell trades to the total number of trades, shares traded and dollar volume in a whole day. For every stock, the six groups of variables about the institutional or individual net trades are averaged across 2 days (day -2 and -1) and 13 days (day -15 to -3) before the reform announcements. The following table reports the means and medians for these averages across the 103 stocks with the *medium* prior-reform percentage institutional holding. Shares traded and dollar volumes are reported in thousands. The t test and Wilcoxon median test are applied to compare the 2-day and 13-day averages.

		Institutional investors			Individual investors		
		2-day average	13-day average	Difference	2-day average	13-day average	Difference
# of net trades	Mean	1.738	-0.018	1.756***	-2.820	-0.446	-2.375***
	Median	0.500	-0.118	1.598***	-2.000	-0.231	-2.538***
# of net traded shares	Mean	122.19	5.48	116.71***	-0.71	-0.18	-0.54***
	Median	35.58	-5.97	64.07***	-0.37	-0.06	-0.31***
Net volume	Mean	679.29	37.94	641.34***	-2.71	-0.26	-2.44***
	Median	145.25	-6.28	301.59***	-1.81	-0.36	-1.72***
Percentage # of net trades	Mean	0.28%	-0.09%	0.37%***	-0.82%	-0.17%	-0.65%***
	Median	0.16%	-0.11%	0.46%***	-0.78%	-0.21%	-0.49%***
Percentage # of net traded shares	Mean	2.71%	-1.52%	4.24%***	-0.05%	-0.01%	-0.04%*
	Median	1.83%	-1.70%	3.18%***	-0.03%	-0.01%	-0.01%*
Percentage net volume	Mean	2.78%	-1.47%	4.25%***	-0.05%	-0.01%	-0.04%**
	Median	1.89%	-1.67%	3.14%***	-0.03%	-0.01%	-0.01%**

***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively

Table 2.8: Net trades for the group with lowest prior-reform institutional holding before reforms

This table shows evidence about one of the constraints to institutions' strategic informed trading. We separate the 309 restructured firms into three sub-samples by the percentage institutional holding for the closest half-year end before reforms. For stock i , the percentage institutional holding ($PROP_i$) at half-year end is defined as

$$PROP_i = \sum_{j=1}^N \frac{Own_{i,j}}{Total_i}$$

Here, $Own_{i,j}$ represents the number of shares of stock i held by institution j . $Total_i$ represents the total tradable shares outstanding for stock i .

For every stock in everyday, number of institutional or individual net trades (number of net traded shares and net trading volume) denotes the difference between the summed institutional or individual buy and sell trades. Percentage number of institutional or individual net trades, number of net traded shares traded and net volume are defined as the difference between the ratios of the summed institutional or individual buy and sell trades to the total number of trades, shares traded and dollar volume in a whole day. For every stock, the six groups of variables about the institutional or individual net trades are averaged across 2 days (day -2 and -1) and 13 days (day -15 to -3) before the reform announcements. The following table reports the means and medians for these averages across the 103 stocks with the *lowest* prior-reform percentage institutional holding. Shares traded and dollar volumes are reported in thousands. The t test and Wilcoxon median test are applied to compare the 2-day and 13-day averages.

		Institutional investors			Individual investors		
		2-day average	13-day average	Difference	2-day average	13-day average	Difference
# of net trades	Mean	0.893	0.174	0.719	-1.976	-0.050	-1.926***
	Median	0.500	0.000	0.598	-1.000	0.846	-1.000***
# of net traded shares	Mean	42.68	7.49	35.20	-0.50	-0.06	-0.44**
	Median	2.34	-0.02	18.79**	-0.30	0.12	-0.34***
Net volume	Mean	189.13	28.51	160.63	-2.10	-0.09	-2.01***
	Median	6.92	6.57	82.37	-1.42	0.61	-1.33***
Percentage # of net trades	Mean	0.18%	-0.05%	0.23%*	-0.59%	-0.03%	-0.57%***
	Median	0.13%	-0.02%	0.24%**	-0.51%	0.20%	-0.34%**
Percentage # of net traded shares	Mean	1.21%	-0.75%	1.96%*	-0.06%	0.00%	-0.06%***
	Median	1.04%	-0.97%	2.29%**	-0.04%	0.01%	-0.02%***
Percentage net volume	Mean	1.26%	-0.69%	1.95%*	-0.06%	0.00%	-0.06%***
	Median	1.25%	-0.92%	2.33%**	-0.04%	0.01%	-0.02%***

***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively

Table 2.9: cumulative price change, trades and volume by trade sizes

The table provides the mean percentage of the cumulative stock price change, percentage of trades, and percentage of volume by trade size for the whole sample and three sub-samples. Large-size and small-size trades are defined in the same way as we define the institutional and individual trades. The remaining trades are classified as medium-size trades. A stock price change corresponding to a specific trade is defined as the difference between that trade's price and the price of the previous trade. For each stock, the percentage of cumulative price change for trades of a given size is the sum of all stock price changes occurring on trades in that size category divided by the total cumulative price change in that stock over the sample. The weighted cross-sectional mean of the cumulative stock price change are then estimated and reported below where the weights are the absolute value of the cumulative price change of each stock in the sample. The percentage of trade (volume) is the number of all transactions (the sum of volume), in a given size category, divided by the total number of trade (the total volume) in the sample. The sample only consists of stocks with *non-zero price change* in the days before reform announcements.

<i>Panel A: average across the whole sample</i>						
Trade size	13-day average before reforms			2-day average before reforms		
	% of cumulative price change	% of trades	% of volume	% of cumulative price change	% of trades	% of volume
Small	-3.13%	10.10%	0.72%	-4.77%	9.45%	0.62%
Medium	51.15%	85.26%	70.29%	34.77%	84.66%	65.62%
Large	51.98%	5.09%	31.40%	70.00%	6.31%	36.04%
<i>Panel B: average across the sub-sample with lowest institutional holding</i>						
Small	-4.14%	12.30%	1.03%	-2.19%	11.39%	0.87%
Medium	66.46%	85.25%	79.92%	46.63%	85.28%	76.50%
Large	37.68%	2.86%	22.18%	55.56%	3.89%	26.38%
<i>Panel C: average across the sub-sample with medium institutional holding</i>						
Small	-2.49%	9.95%	0.69%	-5.60%	10.14%	0.69%
Medium	57.60%	86.39%	73.98%	28.42%	85.36%	70.20%
Large	44.89%	3.83%	26.53%	77.18%	4.71%	30.49%
<i>Panel D: average across the sub-sample with highest institutional holding</i>						
Small	-2.72%	8.05%	0.43%	-5.53%	6.88%	0.30%
Medium	36.76%	84.16%	57.15%	32.69%	83.35%	50.61%
Large	65.97%	8.31%	44.42%	72.84%	9.85%	49.34%

Table 2.10: Net trades of sample and sub-sample restructured firms after reforms

For every stock in everyday, number of institutional or individual net trades (number of net traded shares and net trading volume) denotes the difference between the summed institutional or individual buy and sell trades. Percentage number of institutional or individual net trades, number of net traded shares traded and net volume are defined as the difference between the ratios of the summed institutional or individual buy and sell trades to the total number of trades, shares traded and dollar volume in a whole day. For every stock, the six groups of variables about the institutional or individual net trades are averaged across 2 days (day 1 and 2) and 13 days (day 3 to 15) after the reform plans are implemented. The following table reports the means and medians for these averages across the whole sample and sub-samples of restructured firms. Shares traded and dollar volumes are reported in thousands. The t test and Wilcoxon median test are applied to testify the significance of the means and medians of these 2- and 13-day averages after reforms.

Panel A: Institutional net trades (buys-sells) for the whole sample and sub-samples after the reform completions												
		All firms			Highest			Medium			Lowest	
		2-day average	13-day average		2-day average	13-day average		2-day average	13-day average		2-day average	13-day average
# of net trades	Mean	2.667 *	-1.200***		11.456***	-1.486***		-1.757	-1.572***		-1.699*	-0.543*
	Median	-2.000***	-0.894***		-1.000	-1.841***		-3.000**	-0.894***		-2.000***	-0.526***
# of net traded shares	Mean	-268.78	-3.16		-467.26	40.39		-142.23*	-41.20		-196.86***	-8.67
	Median	-124.41***	-32.55***		-122.29	-96.15***		-204.29***	-25.58*		-98.71***	-19.42*
Net volume	Mean	-918.28	-65.22		-1672.08	18.46		-453.34	-189.47*		-629.42***	-24.66
	Median	-448.85***	-137.19***		-638.69	-421.73***		-654.02***	-89.64*		-339.28***	-60.68
Percentage # of net trades	Mean	-0.15%	-0.35%***		0.37%	-0.44%***		-0.40%***	-0.33%***		-0.42%***	-0.27%***
	Median	-0.35%***	-0.33%***		-0.02%	-0.52%***		-0.44%***	-0.31%***		-0.50%***	-0.25%***
Percentage # of net traded shares	Mean	-4.55%***	-3.31%***		-4.48%***	-4.12%***		-3.96%***	-2.99%***		-5.22%***	-2.81%***
	Median	-4.21%***	-3.35%***		-3.94%***	-4.43%***		-4.62%***	-3.01%***		-4.21%***	-2.69%***
Percentage net volume	Mean	-4.46%***	-3.24%***		-4.44%***	-4.05%***		-3.89%***	-2.92%***		-5.06%***	-2.75%***
	Median	-4.14%***	-3.29%***		-3.85%***	-4.29%***		-4.63%***	-2.99%***		-4.14%***	-2.63%***

Table 2.10 (continued)

Panel B: Individual net trades (buys-sells) for the whole sample and sub-samples after the reform completions										
All firms										
			Highest		Medium		Lowest			
			2-day average	13-day average	2-day average	13-day average	2-day average	13-day average		
# of net trades	Mean	12.112***	3.720***	3.825***	11.883***	4.212***	13.505***	3.124***		
	Median	10.500***	2.923***	3.154***	10.000***	3.167***	12.000***	2.308***		
# of net traded shares	Mean	3.68***	1.15***	2.87***	3.57***	1.40***	4.60***	1.14***		
	Median	2.36***	0.63***	1.39***	2.43***	0.67***	3.03***	0.55***		
Net volume	Mean	12.26***	3.88***	4.32***	11.53***	4.41***	13.12***	2.91***		
	Median	10.48***	3.18***	4.07***	9.94***	2.86***	11.68***	1.72***		
Percentage # of net trades	Mean	1.52%***	0.60%***	0.67%***	1.37%***	0.60%***	1.82%***	0.53%***		
	Median	1.20%***	0.44%***	0.53%***	1.03%***	0.37%***	1.66%***	0.41%***		
Percentage # of net traded shares	Mean	0.07%***	0.03%***	0.03%***	0.06%***	0.04%***	0.10%***	0.04%***		
	Median	0.04%***	0.02%***	0.02%***	0.04%***	0.02%***	0.08%***	0.02%***		
Percentage net volume	Mean	0.07%***	0.03%***	0.03%***	0.06%***	0.04%***	0.10%***	0.03%***		
	Median	0.04%***	0.02%***	0.02%***	0.04%***	0.02%***	0.08%***	0.02%***		

***, **, * denotes significance at the 1%, 5%, and 10% levels, respectively

Chapter 3: Related Party Transactions in China before and after the Share Structure Reform

Abstract

We study the relationship between firm value and related party transactions (RPTs) in China. We find that firm value (as measured by Tobin's Q) is negatively related to RPTs but the relation becomes insignificant after controlling for corporate governance characteristics. Following Cheung, Rau and Stouraitis (2006), we use abnormal returns in response to announcements of RPTs as a direct measure of the impact of RPTs on firm value. We observe significantly negative abnormal returns before the Share Structure Reform. After the reform, the abnormal returns become insignificant. The evidence suggests that RPTs are not as detrimental to firm value after the reform as they were before the reform. This is consistent with our hypothesis that the reform increases the takeover pressure from external market and thus moderates controlling shareholders' propensity to tunnel wealth via RPTs.

3.1 Introduction

Related party transactions play a controversial role in corporate financial management. On one hand, related party transactions between members of a business group can effectively deal with difficulties or constraints imposed by imperfect external markets. Lincoln et al. (1996) find that related party transactions help avoid market uncertainty and reduce the variability of firm performance. Shin and Young (1999) find that borrowing or lending between member firms lessens external financing constraints of conglomerates. Khanna and Palepu (2000) suggest that individual firms in emerging markets often find it difficult to acquire necessary resources due to imperfect markets and lack of intermediary institutions. In consequence, firms form large business groups and benefit from transactions with members within the same group. La Porta, Lopez-de-Silanes, and Zamarripa (2003) argue that borrowing and lending between related parties can benefit both the borrower and the lender because of less information asymmetry and better alignment of incentives.

On the other hand, related party transactions may be used by controlling shareholders to expropriate wealth at the expenses of minority shareholders (La Porta, Lopez-de-Silanes, and Shleifer, 1999). “Tunneling” (i.e. wealth expropriation by controlling shareholders) is indeed a worldwide phenomenon and has been documented in U.S. (Barclay and Holderness, 1989), Europe (Johnson et al., 2000), Italy (Zingales, 1994), Korea (Bae et al., 2002), India (Bertrand et al., 2002), Bulgaria (Atanasov, 2005), and East Asia (Claessens et al., 2002).³³ Gordon, Henry and Palia

³³ Johnson et al. (2000) uses “tunneling” to describe the expropriation of controlling shareholders at the expense of minority shareholders.

(2004) find that related party transactions have a significant negative effect on industry-adjusted stock returns in U.S. market. Cheung, Rau and Stouraitis (2006) find that, in Hong Kong market, firms announcing related party transactions earn significant negative abnormal return, which suggests that such transactions on average are detrimental to firm value.

Chinese stock market has attracted a lot of interest in recent years because of its phenomenal growth and huge potential. An increasing number of papers examine related party transactions in China. Jian and Wong (2004) study a sample of 131 Chinese listed firms in the basic materials industry and find that firms controlled by a corporate group tend to divert profits to members in the same group via related party transactions. Aharony, Wang and Yuan (2006) examine a random sample of 140 Chinese listed firms and document strong empirical evidence on the negative impact of related party transactions on earnings informativeness and the quality of earnings forecasts. Cheung et al. (2007) analyze related party transactions between Chinese listed firms and their state-owned enterprises (SOEs) shareholders and find that firms with the highest state ownership and controlled by local government SOEs engaged in tunneling at the expenses of minority shareholders. Deng, Gan and He (2007) relate the prevalence of related party transactions in Chinese stock market to the unique “incomplete restructuring” process that most Chinese publicly listed firms have gone through. Under the old central-planning economic system, Chinese SOEs took orders from government for production and distribution of goods and services and were responsible to provide their employees all the necessary social welfare including child care, medical care, retirement benefits, etc. Since late 1970s, Chinese government started reforming the system to stimulate economic growth and restructured Chinese state-owned enterprises (SOEs) to become modern share-holding companies. To

make the new share-holding company attractive for outside investors, high quality performing assets of the old SOE were carved out and put on the balance sheet of the new company while the old SOE continue to carry the other obsolete assets and huge social liabilities and hold the controlling rights of the new company. After the new company became publicly listed in stock exchange, the parent company feel entitled to the profits of the list company and use its controlling power to siphon resources from the listed company through transactions between the listed company and the controlling parent or other subsidiaries of the parent company.

In this paper, we extend this line of research by examining two issues about related party transactions (RPTs) in China. The first issue concerns the impact of RPTs on market valuation of Chinese listed firms. Jian and Wong (2004) find that firm value is negatively related to RPTs for a sample of 131 Chinese firms in the basic materials industry. Cheung et al. (2007) find that tunneling by Chinese provincial or local government shareholders reduces firm value. We use a database of RPTs for more than 1,200 firms to examine the relation between firm value and RPTs. In addition, we follow Cheung, Rau and Stouraitis (2006) to study market reaction to the announcement of RPTs. Cheung, Rau and Stouraitis (2006) find a negative announcement effect in Hong Kong market. If RPTs in China are also detrimental to firm value, we should observe a negative effect as well.

The second issue is whether the Share Structure Reform changes the impact of RPTs and their impact on firm value. Before the Share Structure Reform, about two thirds of all outstanding shares are non-tradable and it is impossible to acquire control of a listed firm via open market purchases. Shielded from the external takeover threat, controlling shareholders can siphon assets away from a listed firm without being afraid of losing control of the firm. The Share Structure Reform reduced the

proportion held by controlling non-tradable shareholders and increased the proportion of tradable shares. This makes it easy for outside investors to acquire control of the listed firm. An increase in external takeover threat may help curb controlling shareholders' tunneling behavior and reduce the negative impact of RPTs. We provide empirical evidence on this issue by studying the relation between firm value and RPTs for all firms in the post-reform period, and the impact of the Share Structure Reform on the announcement effect for a sample of firms that have completed the Share Structure Reform.

Our main findings are the following. First, consistent with the view that RPTs are used for tunneling by controlling shareholders, we find the occurrence of RPTs in china is related to corporate governance. Firms with weak corporate governance have more RPTs. Second, firm values, as measured by Tobin's Q, are negatively related to some types of RPTs. However, the negative relation becomes insignificant after we control for corporate governance characteristics. This suggests that at least part of the negative impact of RPTs on firm value is due to the close relationship between RPTs and corporate governance. Third, we observe strong negative abnormal returns in response to the announcement of RPTs before the Share Structure Reform. This abnormal return is stronger for firms with high proportion of institutional investors. Fourth, after the Share Structure Reform, RPT activities increased in the total amount, but remained at the same level when scaled by total assets or total sales. This suggests that the post-reform increase in RPTs is mainly due to the contemporaneous increase in business activities. Last and more importantly, there is some evidence that the Share Structure Reform reduced the negative impact of RPTs. Firms that completed the reform have insignificant abnormal returns to the announcement of RPTs after the reform. In particular, firms with high proportion of institutional

investors have positive but insignificant abnormal returns in the post-reform period, in contrast to the significantly negative abnormal returns they had in the pre-reform period. The difference in abnormal returns between the pre-reform and the post-reform periods is significant. The evidence suggests that RPTs are not as detrimental to firm value after the reform as they were before the reform, especially for firms with high proportion of institutional holdings.

The remaining of the paper is organized as follows. Section 3.2 reviews the literature and proposes our hypotheses. Section 3.3 describes our data. Section 3.4 presents the main results. Section 3.5 concludes the whole paper.

3.2 Hypothesis development and related literature

Corporate governance is a set of mechanisms through which outside investors protect themselves against expropriation by insiders (La Porta et al. (2000)). Good corporate governance practices can help to limit the occurrence of RPTs that are used to tunnel wealth. Thus corporate governance practices may shape the role of RPTs in corporate financial management. Following the literature, we characterize corporate governance by variables in several categories. First, share concentration is one of the key determinants of corporate governance (Shleifer and Vishny (1997)). Large controlling shareholders have both incentives to prevent and engage in expropriation (Claessens et al. (2000) and Claessens et al. (2002)). However, in China, before the Share Structure Reform, controlling shareholders mainly hold non-tradable shares. These shares account for over half of all outstanding shares and cannot be traded freely in the open market. Open-market takeovers are almost impossible to happen. Takeovers are less likely to threaten the tunneling incentives of these controlling

shareholders. They are more likely to extract some wealth from listed companies at the expense of minority shareholders. We expect that corporate governance practices are better for firms with fewer shares concentrated in controlling shareholders. These firms may carry out fewer related party transactions.

Second, accounting standards, e.g. disclosure quality, play a critical role in corporate governance (La Porta et al. (1998)). Mitton (2002) argues that a firm has higher disclosure quality if it has a listed American Depositary Receipt (ADR) or an auditor from the biggest accounting firms. In China, a firm with B or H shares has higher disclosure quality (Bai et al. (2004)). We expect that firms with B or H shares and firms audited by the Big-Four accounting firms have relatively better corporate governance and do fewer RPTs. All above attributes, share structure and disclosure quality, related to corporate governance can affect RPTs to a large extent. We also use variables of board structure as measures of corporate governance attributes, including the size of the board of directors, the number of independent directors, and the size of the board of supervisors³⁴.

Besides the above corporate governance attributes, some other firm attributes may also affect the occurrence of RPTs. RPTs are more likely to occur in business groups (Jian and Wong (2004) and Bae et al. (2002)). Institutions may influence corporate governance, therefore RPTs, through private negotiations (Carleton et al. (1998)). We expect that firms owned by institutions in large proportions are better monitored and less likely to do RPTs. Size may also be closely related to RPTs. Regular businesses of larger firms are more active due to the larger market shares, stronger competitive power and broader scales. Therefore, we have the following hypothesis:

³⁴ According to the Company Law of China, board of supervisors is established to monitor the financial situation of companies, and the behavior of board of directors and managers.

Hypothesis 1: *RPTs are closely related to corporate governance attributes. Firms with small proportion of controlling shareholders or with large proportion of institutional shareholders tend to have fewer RPTs. Firms that have B or H shares and are audited by the Big-Four accounting firms are also likely to have fewer RPTs.*

Do RPTs affect market valuations of Chinese listed firms? On one hand, investors welcome RPTs that promote the efficiency of corporate financial management. Such transactions would have positive effect on firm value. On the other hand, RPTs are associated with increased probability of being misused by controlling shareholders. They may have a negative effect on firm value. In China, controlling shareholders are likely to use RPTs for tunneling wealth for historical reasons (Deng, Gan and He (2007)). We thus expect that firm value will be negatively related to RPTs before the Share Structure Reform.

Because RPTs are less likely to occur in firms with good corporate governance, the relationship between RPTs and firm value may partly be due to corporate governance attributes. Literature shows evidence that good corporate governance is associated with higher firm value at both country and firm levels. At country level, La Porta et al. (2002) find evidence of higher valuation of firms in countries with better protection of minority shareholders. At firm level, Klapper and Love (2004), Durnev and Kim (2005), and Mitton (2002) find that better corporate governance is associated with higher Tobin's Q or stock price performance. Bai et al. (2004) find positive relationship between corporate governance and market valuation in China. For the close relationships between RPTs and corporate governance, and between the corporate governance and firm value, it is possible that the association between RPTs

and firm value is due to the corporate governance attributes of the firms with these transactions. So we have the following hypothesis:

Hypothesis 2: *before the Share Structure Reform, firms with more RPTs have smaller firm values. This negative effect may be partly explained by corporate governance practices of these firms.*

It is interesting to know whether the Share Structure Reform affects the pattern of RPTs. After the Share Structure Reform, a portion of non-tradable shares become tradable immediately after reform completes. All non-tradable shares will become tradable after the lock-up period. Controlling shareholders hold fewer shares after they pay considerations to tradable shareholders in the reform. On one hand, reduced proportion of shares held by controlling shareholders weakens their controlling power. Restrictions on share trading are removed to certain degree. More potential takeovers may threaten the tunneling of controlling shareholders. The occurrence of RPTs may be reduced. On the other hand, RPTs may not be affected significantly if controlling benefits still far dominate the costs to controlling shareholders shortly after the reforms. It is an empirical issue whether the Share Structure Reform will affect the pattern of RPTs.

How the market reacts to the announcement of RPTs is an important measure of the impact of RPTs on market valuation of Chinese listed firms. Cheung, Rau and Stouraitis (2006) find that investors react negatively to the announcement of RPTs in Hong Kong market. In mainland China, before the Share Structure Reform, external takeover cannot threaten the tunneling of controlling shareholders with RPTs due to the trading restrictions imposed on non-tradable shares. Tunneling with RPTs is

detrimental to firm value. We expect that investors react negatively to the announcement of RPTs before the Share Structure Reform. The Share Structure Reform makes it easy for outside investors to acquire control of the listed firm. External takeover threat may help curb controlling shareholders' tunneling behavior and reduce the negative impact of RPTs. We expect that the Share Structure Reform reduces the negative market reactions to the announcement of RPTs. Because the takeover threat is stronger for firms with large proportion of institutional shareholders, we expect such firms are more strongly influenced by the reform. We have the following hypothesis:

Hypothesis 3: *The Share Structure Reform mitigates the negative impact of abnormal returns in response to the announcement of RPTs, especially for firms with high proportion of institutional holdings.*

3.3 Data

We collect the data of RPTs in years 2002-2006 from CCER (Center of China Economic Research). Chinese accounting standards³⁵ classify RPTs into eleven categories, e.g. purchases/sales of goods, purchases/sales of services, purchases/sales of other assets, lending/borrowing, loan guarantee, products and services delegation, asset lease, et al. Companies are required by regulations to disclose all RPTs in every year, including information about related parties, the amount and type of each transaction. CCER compiles the information from annual reports.

³⁵ "Accounting Standards for Business Enterprises-Related Parties and Related Party Transaction Disclosure" took effect on Jan. 1, 1997. The latest accounting standards took effect on Jan. 1, 2007. In the new standards, the disclosure requirements on the RPTs did not change.

CSMAR database provides us the data of share structure for the beginning of year 2004 and year 2006. For every listed company, we collect the proportion of shares held by the largest ten shareholders and the proportion of shares held by the largest ten tradable shareholders to all outstanding shares, the name and nature of the controlling shareholder, and the name of the auditor. The name and nature of the controlling shareholder show us whether it is a business group. The name of the auditor shows us whether the auditor is one of the biggest four accounting firms. We collect from WIND database the proportion of shares held by the non-tradable shareholders, the proportions of B or H shares, and the proportion of shares held by institutional investors to all outstanding shares.

Data of financial information and stock market performance are also collected from CSMAR database. We collect some items on the balance sheet and income statement, with which we can compute the leverage and profitability measures. Together with the market value of tradable shares, we can compute Tobin's Q ³⁶, which is used to measure firm value.

According to Chapter 10 of the *“Rules Governing the Stock Listing in Shanghai and Shenzhen Stock Exchanges”*, listed firms are required to announce timely RPTs with a total value of more than RMB 3 million or 0.5% of the firm's audited total equity, whichever is highest, through public press release. Details of the transactions should be disclosed in subsequent financial reports. CCER and CSMAR databases collect RPTs from annual reports, but do not have the announcement days of RPTs. We manually collect the announcement days from the official websites of Shanghai and Shenzhen Stock Exchanges. 228 firms completed reforms before Jan 1,

³⁶ Before the share structure reform, on average about 63% (see Panel A of Table 3.2) of all outstanding shares are non-tradable without observable market price. The calculation of Tobin's Q is slightly modified accordingly. Tobin's $Q = (\text{market value of tradable shares} + \# \text{ of non-tradable shares} \times \text{equity per share} + \text{book value of liabilities}) / \text{total assets}$.

2006. 511 announcements of RPTs of these firms in year 2004-2006 are used to study the announcement effect before and after the Share Structure Reform, among which 291 (220) announcements occurred before (after) reforms. Daily returns of individual stocks and daily market returns are collected from CSMAR.

3.4 Empirical results

3.4.1 Descriptive information about RPTs

In this section, we provide some descriptive information about RPTs in China. From year 2002 to year 2006, totally 68,300 RPTs occurred in our sample. These transactions amounted to RMB 3,739 billion in the five years. For every firm in every year, we sum the amounts of transactions and count the number of transactions by types of transactions. Panel A of Table 3.1 describes the amounts of 10 types of most prevalent RPTs. In the first two rows, we list the number of listed firms and the total amount of all types of transactions. For every type of transaction, we present the number of firms that conducted this type of transaction, the mean and median amounts of transactions across these firms, and the percentage of the total amount of this particular type of transaction to the total amount of all types of transactions. Panel B of Table 3.1 describes the number of RPTs.

From Panel A of Table 3.1, we can see that around half of the listed firms purchased from or sold goods to their related parties. Related party purchases of goods accounted for the largest proportion of the total amount of all types of RPTs, 25.15% in year 2002 and 26.76% in year 2006. The proportion of related party sales of goods accounted for 22.76% in year 2002 and 19.23% in year 2006. In terms of

the total amount, over 50% of all transactions took place in the operating businesses with related parties, i.e. related party purchases and sales of goods and services. Listed companies both offered and received loan guarantees frequently and in large amounts. They received more loan guarantees than they offered. In year 2006, 299 companies offered loan guarantees to their related parties, whereas 659 companies received loan guarantees from related parties. In the same year, the loan guarantees received accounted for 21.13% of the total amount of all transactions, which was about 4 times of the loan guarantees offered. This is consistent with the observation in Johnson et al. (2000) that controlling shareholders prop up listed companies by offering loan guarantees. Listed companies also borrowed money from or lent money to related parties occasionally.

Comparing RPTs across the five years, we observe an upward trend in the occurrence of almost all types of RPTs. In year 2002, 574 (576) firms purchased (sold) goods from (to) their related parties, which amounted to 197.81 (178.43) million per firm on average; in year 2006, 808 (792) firms purchased (sold) goods from (to) their related parties, which amounted to 387.40 (284.05) million per firm on average. Similar patterns can also be found in loan guarantees, assets transactions and loans, although there were slight fluctuations. Panel B of Table 3.1 shows similar patterns in the number of RPTs.

3.4.2 RPTs and corporate governance before the Share Structure Reform

This section presents evidence on the relationship between corporate governance attributes and RPTs. Based on observations in Table 3.1, the following empirical analyses will concentrate on the operating RPTs and net loan guarantees received by the listed companies. We define operating RPT as the summation of

related party sales and purchases of goods and services, and net loan guarantee received as the difference between loan guarantees received and loan guarantees offered. These transactions accounts for most of RPTs and capture the bulk of business and financing activities between listed companies and their related parties. To make it comparable across firms, we scale operating RPTs by sales and scale net loan guarantees by total assets. Panel A of Table 3.2 displays the summary statistics for the scaled RPTs, measures of corporate governance practices and some firm characteristics in year 2004, the year before the Share Structure Reform. Panel B of Table 3.2 displays the correlation coefficients between these variables.

From the first two columns of Panel A of Table 3.2, we see that both operating RPTs and net loan guarantees vary greatly across our sample. Operating RPTs scaled by sales vary between zero and 107% with a standard deviation of 19.24%. Net loan guarantees received scaled by total assets vary between -14.21% and 38.74% with a standard deviation of 9.27%. We also observe asymmetric distributions of the two variables across all sample companies. Over 25% of all companies did not conduct operating transactions with related parties at all, whereas some companies conducted these transactions in very large amount relative to sales. The asymmetric distributions caused much lower median than mean scaled amounts of both operating RPTs and net loan guarantees. Panel A of Table 3.2 also shows that on average 9% of all sample companies issued either B or H shares, and annual reports of 8% companies were audited by the Big-Four accounting firms. In year 2004, non-tradable shareholders on average held 63.25% of all outstanding shares. This percentage ranged from 40.1% to 85.28% across all sample firms with a median of 63.64% and a standard deviation of 11.43%. Controlling shareholders on average held 42.81% of all outstanding shares with large variation. About 45% of all sample

firms were controlled by business groups. Institutional investors held only 4.34% of all outstanding shares. Their holdings were very concentrated. Stocks of over half of the sample companies were only held by individuals. We do not expect that the correlations in Panel B of Table 3.2 would cause serious multi-collinearity problem in regressions.

Table 3.3 presents the regression results for the relationship between RPTs and corporate governance variables. The first three models of Table 3.3 report the association between the amount of operating RPTs scaled by sales and corporate governance measures before the Share Structure Reform. We control for size, growth potential, leverage, and profitability. In Model 1, we use proportion of non-tradable shares and the ratio of shares held by top 10 tradable shareholders to all non-tradable shares to represent the share structure. Proportion of non-tradable shares is significantly positively related to the amount of operating RPTs. Firms held by non-tradable shareholders in smaller proportions have fewer RPTs. We can also observe that firms with either B or H shares, firms that apply more transparent disclosure policies, are less likely to do operating RPTs. Firms monitored by the Big-Four accounting firms also had fewer operating RPTs. Consistent with Jian and Wong (2004), we find that the dummy for firms controlled by groups is significantly positively related to operating RPTs. In addition, firms with larger proportion of institutional holdings conduct fewer RPTs.

In Model 2 of Table 3.3, share structure is measured with proportion of shares held by the controlling shareholder, and the ratio of shares held by top 2 to top 5 shareholders to shares held by the controlling shareholder. Proportion of shares held by controlling shareholder is significantly positively related to the amount of

operating RPTs. It is more convenient for controlling shareholders to engage in RPTs when shares are more concentrated in their hands.

In Model 3 of Table 3.3, we use both proportion of non-tradable shares and proportion of shares held by the controlling shareholder to represent share structure. The coefficients of both proportions remain positively significant. The effect of split share structure on operating RPTs is not only due to the controlling effect of non-tradable shareholders, but also due to trading restrictions on the shares held by these controlling shareholders. In all first three models of Table 3.3, the relationship between size and the amount of operating RPTs remains significantly positive. Larger firms do more RPTs as our hypothesis predicts.

In Models 4, 5, and 6 of Table 3.3, we run regressions of net loan guarantees scaled by total assets in year 2004. Firms audited by the Big-Four accounting firms received significantly less net loan guarantees from related parties. Proportions of shares held by non-tradable shareholders and controlling shareholder are significantly positively related to net loan guarantees received. Before the Share Structure Reform, controlling non-tradable shareholders may offer loan guarantees to listed firms in trouble to facilitate their loaning, especially the firms whose shares are held by them in large proportions. Size of board of supervisors is marginally significantly negatively related to the scaled amount of net loan guarantee received.

In summary, the empirical evidence shows that firms with strong corporate governance have fewer RPTs. In particular, firms that have B or H shares and are audited by the Big-Four accounting firms are less likely to have RPTs. So are firms with small proportion of controlling shareholders or with large proportion of institutional shareholders.

3.4.3 RPTs and firm value before the Share Structure Reform

This section reports the empirical results on whether RPTs affect firm value and provide evidence on Hypothesis 2. Following previous literature such as Jian and Wong (2004), we use Tobin's Q to measure firm value and run regressions of Tobin's Q against measures of RPT activities. The first two models of Table 3.4 are about the relationship between operating RPTs and firm value in the pre-reform period. In Model 1, we do not include corporate governance measures. After we control for size, leverage and profitability, the dummy variable for firms that conducted non-zero operating RPTs is significantly negatively related to Tobin's Q at 10% significance level. Consistent with Hypothesis 2, the result indicates that operating RPTs reduce firm value. In Model 2, we add the corporate governance measures we used in previous section. The significance of the dummy for firms that conducted non-zero operating RPTs disappears. The strong association between operating RPTs and corporate governance practices can partially explain the negative effect of these transactions on firm values.

The last two models of Table 3.4 are about the relationship between net loan guarantees received and firm value. In both models, the firms that received positive net loan guarantees have smaller firm values. The negative impact of net loan guarantees on firm value is insignificant.

In summary, consistent with Hypothesis 2, we find that RPTs have a negative effect on firm value during the period before the Share Structure Reform. At least part of the observed negative impact of RPTs on firm value is due to the close relationship between RPTs and corporate governance.

3.4.4 Change in RPTs before and after the Share Structure Reform

In this section, we examine the influence of the Share Structure Reform on the occurrence of RPTs. There were 1324 firms listed in both year 2004 and 2006, 10 of which were financial firms. We divide the 1314 non-financial firms into two groups. One group consists of 228 firms which completed reforms before Jan 1st, 2006. RPTs of these firms in year 2006 were carried out after the reforms complete. The other group consists of the other 1086 firms which were still in the process of reforms or did not start reforms yet in year 2006. Table 3.5 reports the mean and median changes in share structures and the mean changes in RPTs from year 2004 to 2006 for the two groups. Table 3.6 reports the proportions of firms with positive changes in RPTs to the total number of firms in every group.

From Panel A of Table 3.5, we can see that proportion of non-tradable shares declined significantly more for the group which completed reforms than the group of remaining firms, due to the share structure reforms. Proportion of shares owned by controlling shareholder also declined significantly more for the group of firms which completed reforms. The top 10 tradable shareholders for the group of firms which completed reforms held fewer shares at the beginning of year 2006 than they did at the beginning of year 2004, whereas those for the group of firms which did not complete reforms held more. Proportion of shares held by institutions increased significantly more for the group of firms that completed reforms. As desired by the government, the Share Structure Reform changed the share structure between non-tradable and tradable shareholders and between controlling and minority shareholders significantly.

Panel B of Table 3.5 shows the mean changes in operating RPTs. We observe that both of the two groups of firms did more operating transactions with related

parties in year 2006 than they did in year 2004. The total amount and number of operating RPTs increased significantly more for the group which completed reforms than the group which did not complete reforms. However, we cannot observe significant differences in mean changes in the amount scaled by sales or assets between the two groups. The difference in significance between the comparisons of total and scaled amounts indicates that the larger increase in the total amount of operating RPTs for one group is mainly due to the larger increase in business activities for that group. The Share Structure Reform did not reduce operating RPTs on average.

Panel C of Table 3.5 shows the mean changes in net loan guarantees received from related parties. We can observe that the mean change in the amount of net loan guarantees received across the group of firms which completed reforms were significantly larger than that across the remaining firms at 1% significance level. However, the mean change in the scaled amount is not so significantly different between the two groups. Evidence shows that the Share Structure Reform did not reduce net loan guarantees received by listed companies either.

From Table 3.6, we can observe that, for all types of RPTs, the proportions of firms with positive changes in these transactions for the group which completed reforms are either significantly larger than, or indifferent from those for the remaining firms. Consistent with the results in Table 3.5, we do not observe significant reductions in RPTs after the Share Structure Reform.

In summary, we find that share structure indeed changed substantially after the Share Structure Reform. After the Share Structure Reform, RPT activities increased in the total amount, but remained at the same level when scaled by total assets or total

sales. The post-reform increase in RPTs is mainly due to the increase in business activities.

3.4.5 Market valuations of RPTs after the Share Structure Reform

RPTs and Tobin's Q after the Share Structure Reform

In this section, we present results about the relationship between RPTs and firm value after the Share Structure Reform. Table 3.7 reports the regression results. In all regressions, we control for size, corporate governance, leverage and profitability. We use data for 1213 firms that have positive total equity and available data in the regressions. We divide the whole sample into sub-samples according to whether the firm completed reform before Jan 1, 2006 and whether the firm conducted operating RPTs (or received positive net loan guarantees) in year 2006. We then use the dummy variable presenting these sub-samples in our regression model to examine the effect of the Share Structure Reform. In all regressions, we cannot observe significant differences between the effect of RPTs on firm values in firms that completed reform and the effect in firms that have not completed reforms. In the following section, we go one step further to study whether the Share Structure Reform changes the impact of RPTs on market valuation by investigating the announcement effect before and after the Share Structure Reform.

Announcement effect before and after the Share Structure Reform

In this section, we examine investors' reactions to the announcement of RPTs in both pre- and post-reform period to test Hypothesis 3. 228 firms completed reforms before Jan 1, 2006. 511 announcements of RPTs of these firms in year 2004-2006 are used to study the announcement effect. 291 (220) announcements occurred

before (after) reforms. For every announcement of every firm, we firstly estimate coefficients of the market model. We use an estimation period of 200 trading days, from day -210 to day -11, relative to the date of the announcement, day 0. We use the value-weighted average return of all stocks in both Shanghai and Shenzhen Stock Exchanges as market return. We then compute abnormal returns on day -2 through day 3 based on the estimated coefficients for every announcement event. To examine the robustness of our results, we use four event windows: (-2, 2), (-2, 3), (-1, 2) and (-1, 3). We include day -1 or day -2 in an event window to address the concern that some RPT deals may have been completed and become known to some investors before the public announcements. We calculate the average abnormal return for each event window as the summation of daily abnormal returns divided by number of days in that window.

Table 3.8 reports the average abnormal returns in the pre-reform and the post-reform periods, separately. In the pre-reform period, the mean average abnormal returns across 291 announcements are negatively significant at 5% or 10% significance levels for all four event windows. In the post-reform period, the mean average abnormal returns across 220 announcements are insignificant. The evidence indicates that, before the reform, investors view RPTs detrimental to firm values and react negatively to the announcements of RPTs. But after the reform, RPTs are not viewed as detrimental to firm value as before and thus do not cause significant loss in firm value.

Next, we divide the announcements in both pre- and post-reform periods into three equal-size sub-samples according to the listed firm's institutional holding at the nearest year-end before the announcements. Table 3.8 reports the average abnormal returns of firms with high, medium and low institutional holdings, respectively. For

the sub-sample with high institutional holding, in the pre-reform period, the mean average abnormal returns for all event windows are negatively significant at 5% significance level. In the post-reform period, all the mean average abnormal returns are positive but insignificant. Two sample t-tests show that the average abnormal returns are significantly smaller in the pre-reform period than in the post-reform period. For the sub-samples with medium and low institutional holdings, we cannot observe significant mean average abnormal returns in either pre- or post-reform periods. There is also no significant difference between average abnormal returns in the two periods.

In summary, before the Share Structure Reform, investors react significantly negatively to the announcements of RPTs. For firms with high institutional holding, investors react significantly negatively to the announcements of RPTs before the reform, but the negative announcement effect of RPTs disappeared after the reform. This is consistent with our Hypothesis 3 that the reform increases the takeover pressure from external market and thus moderates controlling shareholders' propensity to tunnel wealth via RPTs.

3.5 Conclusion

We study the relationship between firm value and related party transactions (RPTs) in China. We find that firm value (as measured by Tobin's Q) is negatively related to RPTs but the relation becomes insignificant after controlling for corporate governance characteristics. This is not a surprise in view of our findings that RPTs are more frequent in firms with weak corporate governance.

Following Cheung, Rau and Stouraitis (2006), we use abnormal returns in response to announcements of RPTs as a direct measure of the impact of RPTs on firm value. We observe significantly negative abnormal returns before the Share Structure Reform, but the abnormal returns become insignificant after the reform. The evidence suggests that investors do not view RPTs as detrimental to firm value after the reform as they were before the reform.

Furthermore, we find the difference in abnormal announcement returns between the pre-reform and the post-reform periods is the strongest among firms with high proportion of institutional holdings. This supports our hypothesis that the reform increases the takeover pressure from external market and thus moderates controlling shareholders' propensity to tunnel wealth via RPTs.

Reference:

Aharony, Joseph, Jiwei Wang and Hongqi Yuan, 2006, The impact of related party sales by listed Chinese firms on earnings informativeness and earnings forecasts. *Working paper*.

Atanasov, Vladimir, 2005, How much value can blockholders tunnel? Evidence from the Bulgarian mass privatization auctions. *Journal of Financial Economics* 76, 191-234.

Bae, Kee-Hong, Kang, Jun-Koo and Kim, Jin-Mo, 2002, Tunneling or value addition? Evidence from the Korean financial crisis. *Journal of Financial Economics* 71, 265-313.

Bai, Chong-En, Qiao Liu, Joe Lu, Frank M. Song and Junxi Zhang, 2004, Corporate governance and market valuation in China. *Journal of Comparative Economics* 32, 599-616.

Barclay, Michael J. and Clifford G. Holderness, 1989, Private benefits from control of public corporations. *Journal of Financial Economics* 25, 371-395.

Bertrand, Marianne, Paras Mehta and Sendhil Mullainathan, 2002, Ferreting out tunneling: an application to Indian business groups. *The Quarterly Journal of Economics* 117, 121-148.

Carleton, Willard T., James M. Nelson and Michael S. Weisbach, 1998, The influence of institutions on corporate governance through private negotiations: evidence from TIAA-CREF. *The Journal of Finance* 53, 1335-1362.

Cheung, Yan-Leung, P. Raghavendra Rau, and Aris Stouraitis, 2006, Tunneling, propping, and expropriation: evidence from connected party transactions in Hong Kong. *Journal of Financial Economics* 82, 343-386.

Cheung, Yan-Leung, Lihua Jing, P. Raghavendra Rau and Aris Stouraitis, 2007, How does the grabbing hand grab? Tunneling assets from Chinese listed companies to the state. Available at SSRN: <http://ssrn.com/abstract=673233>.

Claessens, Stijn, Simeon Djankov and Larry H.P. Lang, 2000, The separation of ownership and control in East Asian corporations. *Journal of Financial Economics* 58, 81-112.

Claessens, Stijn, Simeon Djankov, Joseph P.H. Fan and Larry H.P. Lang, 2002, Disentangling the incentive and entrenchment effects of large shareholdings. *The Journal of Finance* 57, 2741-2771.

Deng, Jianping, Jie Gan and Jia He, 2007, Privatization, large shareholders' incentive to expropriate, and firm performance. Available at SSRN: <http://ssrn.com/abstract=970056>.

- Durnev, Art and E. Han Kim, 2005, To steal or not to steal: firm attributes, legal environment, and valuation. *The Journal of Finance* 60, 1461-1493.
- Gordon, Elizabeth A., Elaine Henry and Darius Palia, 2004, Related party transactions: associations with corporate governance and firm value. *Working paper*.
- Jian, Ming and T.J. Wong, 2004, Earnings management and tunneling through related party transactions: evidence from Chinese corporate groups. *Working paper*.
- Johnson, Simon, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, 2000, Tunneling. *The American Economic Review* 90, 22-27.
- Khanna, Tarun and Krishna Palepu, 2000, Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. *The Journal of Finance* 55, 867-891.
- Klapper, Leora and Inessa Love, 2004, Corporate governance, investor protection, and performance in emerging markets. *Journal of Corporate Finance* 10, 703-728.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny, 1998, Law and Finance. *The Journal of Political Economy* 106, 1113-1155.
- La Porta, Rafael, Florencio Lopez-de-Silanes and Andrei Shleifer, 1999, Corporate ownership around the world. *The Journal of Finance* 54, 471-517.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny, 2000, Investor protection and corporate governance. *Journal of Financial Economics* 58, 3-27.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny, 2002, Investor protection and corporate valuation. *The Journal of Finance* 57, 1147-1170.
- La Porta, Rafael, Florencio Lopez-de-Silanes and Guillermo Zamarripa, 2003, Related lending. *The Quarterly Journal of Economics*, 231-268.
- Lincoln, James R., Michael L. Gerlach and Christina L. Ahmadjian, 1996, Keiretsu networks and corporate performance in Japan. *American Sociological Review* 61, 67-88.
- Mitton, Todd, 2002, A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis. *Journal of Financial Economics* 64, 215-241.
- Shin, Hyun-Han and Young S. Park, 1999, Financing constraints and internal capital markets: evidence from Korean "chaebols". *Journal of Corporate Finance* 5, 169-191.
- Shleifer, Andrei and Robert Vishny, 1997, A survey of corporate governance. *The Journal of Finance* 52, 737-783.
- Zingales, Luigi, 1994, The value of the voting right: a study of the Milan stock exchange experience. *The Review of Financial Studies* 7, 125-148.

Table 3.1: Description about RPTs in years 2002-2006

This table describes RPTs by types for years 2002-2006. In the five years, totally 68300 RPTs took place, which amounted to RMB 3,739 billion. Chinese accounting standards classify RPTs into eleven categories, e.g. purchases/sales of goods, purchases/sales of services, purchases/sales of other assets, lending/borrowing, loan guarantee, products and services delegation, asset lease, et al. This table lists ten types of the most frequent RPTs. For every firm in every year, the amount of transactions is summed and the number of transactions is counted by separate types. In Panel A, number of listed firms and total amount of all transactions for every year are listed in the first two rows. For every type of transactions, we first list the number of firms with non-zero transactions. The mean and median amounts are computed across the firms with non-zero transactions. Percentage of total amount for particular type of RPTs is defined as the ratio of the total amount of this type of transactions to the total amount of all types of transactions. In Panel B, number of listed firms and total number of all transactions for every year are listed in the first two rows. For every type of transactions, the mean and median numbers of transactions are computed across the firms with non-zero transactions. All amounts are in RMB millions.

Panel A: descriptive information for the amount of RPTs

		2002	2003	2004	2005	2006
	# of listed firms	1200	1263	1343	1358	1398
	Total amount	451489	602433	658260	857272	1169616
Related party purchases of goods	# of firms with trans.	574	655	691	692	808
	mean	197.81	264.21	301.54	333.95	387.40
	median	30.06	29.17	34.23	37.23	40.19
	% of total amount	25.15%	28.73%	31.65%	26.96%	26.76%
Related party sales of goods	# of firms with trans.	576	675	710	699	792
	mean	178.43	225.47	228.69	306.20	284.05
	median	34.22	28.58	30.04	32.55	33.98
	% of total amount	22.76%	25.26%	24.67%	24.97%	19.23%
Related party purchases of services	# of firms with trans.	351	448	456	511	592
	mean	53.07	56.35	50.13	64.13	98.59
	median	7.96	6.27	6.67	6.43	9.10
	% of total amount	4.13%	4.19%	3.47%	3.82%	4.99%
Related party sales of services	# of firms with trans.	180	222	243	244	332
	mean	30.63	32.71	44.89	49.58	60.69
	median	5.15	5.50	3.40	3.32	4.59
	% of total amount	1.22%	1.21%	1.66%	1.41%	1.72%
Related party purchases of other assets	# of firms with trans.	237	244	256	260	315
	mean	142.82	83.64	85.34	60.34	117.45
	median	35.73	22.30	19.75	14.58	24.19
	% of total amount	7.50%	3.39%	3.32%	1.83%	3.16%
Related party sales of other assets	# of firms with trans.	118	150	156	168	177
	mean	43.87	42.49	41.87	46.63	47.75
	median	16.26	10.48	11.81	10.74	14.25
	% of total amount	1.15%	1.06%	0.99%	0.91%	0.72%
Loan guarantee offered	# of firms with trans.	211	206	225	213	299
	mean	148.12	138.36	156.89	167.23	209.49
	median	59.20	50.00	50.00	60.40	84.34
	% of total amount	6.92%	4.73%	5.36%	4.15%	5.36%
Loan guarantee received	# of firms with trans.	384	474	447	546	659
	mean	258.05	249.50	285.21	355.81	374.96
	median	134.35	137.58	180.00	190.00	192.50
	% of total amount	21.95%	19.63%	19.37%	22.66%	21.13%
Related party lending	# of firms with trans.	83	98	84	100	161
	mean	76.76	159.24	71.13	115.86	305.94
	median	26.76	26.47	21.22	23.81	29.00
	% of total amount	1.41%	2.59%	0.91%	1.35%	4.21%
Related party borrowing	# of firms with trans.	49	64	83	120	210
	mean	97.06	171.42	66.19	127.53	303.74
	median	20.00	35.02	25.00	31.25	44.26
	% of total amount	1.05%	1.82%	0.83%	1.79%	5.45%

(Table 3.1-continued)

Panel B: descriptive information for the number of RPTs

		2002	2003	2004	2005	2006
	# of listed firms	1200	1263	1343	1358	1398
	# of all transactions	9515	11978	12125	14986	19696
Related party purchases of goods	# of firms with trans.	574	655	691	692	808
	mean	3.37	3.79	4.05	4.12	4.40
	median	2.00	3.00	3.00	3.00	3.00
Related party sales of goods	# of firms with trans.	576	675	710	699	792
	mean	4.13	4.27	4.61	5.01	4.97
	median	3.00	3.00	3.00	3.00	3.00
Related party purchases of services	# of firms with trans.	351	448	456	511	592
	mean	2.67	3.03	2.66	3.20	3.65
	median	2.00	2.00	2.00	2.00	2.00
Related party sales of services	# of firms with trans.	180	222	243	244	332
	mean	2.32	2.33	2.35	2.72	3.07
	median	1.00	2.00	2.00	2.00	2.00
Related party purchases of other assets	# of firms with trans.	237	244	256	260	315
	mean	1.68	1.60	1.65	1.65	1.78
	median	1.00	1.00	1.00	1.00	1.00
Related party sales of other assets	# of firms with trans.	118	150	156	168	177
	mean	1.61	1.41	1.42	1.39	1.51
	median	1.00	1.00	1.00	1.00	1.00
Loan guarantee offered	# of firms with trans.	211	206	225	213	299
	mean	3.18	3.14	2.52	4.64	5.69
	median	2.00	2.00	2.00	2.00	3.00
Loan guarantee received	# of firms with trans.	384	474	447	546	659
	mean	1.83	2.03	1.99	3.23	4.29
	median	1.00	1.00	1.00	2.00	2.00
Related party lending	# of firms with trans.	83	98	84	100	161161
	mean	2.04	1.83	1.73	1.81	2.20
	median	1.00	1.00	1.00	1.00	1.00
Related party borrowing	# of firms with trans.	49	64	83	120	210
	mean	2.08	1.39	1.29	1.70	2.20
	median	1.00	1.00	1.00	1.00	1.00

Table 3.2: Summary statistics and correlation matrix for all relevant variables

Operating RPTs include related party purchases and sales of goods and services. Net loan guarantees received represents the difference between loan guarantees received and loan guarantees offered. Operating RPTs are scaled by sales; net loan guarantees received are scaled by Total Assets.

Tobin's Q = (market value of tradable shares + # of non-tradable shares*equity per share + book value of liabilities) / total assets.

The summary statistics for Tobin's Q are only for companies with positive total equity. Dummy variable "*WhetherBorH*" is equal to 1 for companies with either B or H shares. Dummy variable "*WhetherBigFour*" is equal to 1 for companies whose annual reports were audited by the largest four international accounting companies. Dummy variable "*WhetherGroup*" is equal to 1 for companies that are controlled by groups. Proportion of institutional holding is defined as the ratio of shares held by all institutional investors to all outstanding tradable shares. Size is computed as the logarithm of total assets. All variables are computed for year 2004, the year before the Share Structure Reform.

Panel A: Summary statistics

	Operating RPTs	Net loan guarantee received	Tobin's Q	Whether BorH	Whether BigFour	WhetherB orH	Whether Group	Prop. of non-tradable	Prop. of control	Whether inst. holding	Board size	# of indpt. directors	Size of board of supervisors	Firm size
Mean	11.01%	3.71%	1.23	0.09	0.08	0.08	0.45	63.25%	42.81%	4.34%	9.91	3.18	4.29	21.18
Median	2.58%	0.00%	1.15	0.00	0.00	0.00	0.00	63.64%	41.66%	0.19%	9	3	5	21.10
Std.	19.24%	9.27%	0.27	0.29	0.28	0.28	0.50	11.43%	17.05%	9.08%	2.19	0.89	1.45	1.00
Min.	0.00%	-14.21%	0.89	0.00	0.00	0.00	0.00	40.10%	1.06%	0.00%	5	0	2	17.41
Q1	0.00%	0.00%	1.07	0.00	0.00	0.00	0.00	56.03%	28.79%	0.00%	9	3	3	20.55
Q3	12.10%	4.33%	1.29	0.00	0.00	0.00	1.00	70.80%	57.13%	3.70%	11	4	5	21.77
Max.	107.0%	38.74%	2.68	1.00	1.00	1.00	1.00	85.28%	85.00%	61.73%	19	7	12	26.85

Panel B: Correlation matrix

	Tobin's Q	Whether BorH	Whether BigFour	Prop. of non-tradable	Prop. of control	Whether Group	Prop. of inst. holding	Board size	# of indpt. directors	Size of board of supervisors	Firm size
Operating RPTs	-0.06 ^b	0.00	0.01	0.13 ^a	0.24 ^a	0.19 ^a	0.05 ^b	0.09 ^a	0.08 ^a	0.10 ^a	0.13 ^a
Net loan guarantee received	-0.02	-0.09 ^a	-0.10 ^a	-0.02 ^a	0.10 ^a	-0.04	-0.07 ^b	-0.06 ^b	-0.00	-0.08 ^a	-0.02
Tobin's Q	1.00	-0.19 ^a	-0.10 ^a	-0.18 ^a	-0.16 ^a	-0.04	0.00	-0.11 ^a	-0.09 ^a	-0.06 ^b	-0.49 ^a
WhetherBorH		1.00	0.38 ^a	0.46 ^a	-0.05 ^c	0.04	0.15 ^a	0.08 ^a	0.02	0.04	0.23 ^a
WhetherBigFour			1.00	0.29 ^a	0.10 ^a	0.10 ^a	0.24 ^a	0.06 ^b	0.04	0.07 ^b	0.28 ^a
Prop. of non-tradable				1.00	0.40 ^a	0.09 ^a	0.18 ^a	0.10 ^a	0.07 ^b	0.06 ^b	0.13 ^a
Prop. of control					1.00	0.24 ^a	0.17 ^a	-0.01	-0.00	0.07 ^a	0.26 ^a
WhetherGroup						1.00	0.12 ^a	0.11 ^a	0.05 ^c	0.10 ^a	0.19 ^a
Prop. of inst. holding							1.00	0.11 ^a	0.07 ^b	0.09 ^a	0.44 ^a
Board size								1.00	0.65 ^a	0.31 ^a	0.23 ^a
# of independent directors									1.00	0.18 ^a	0.18 ^a
Size of board of supervisors										1.00	0.18 ^a
size											1.00

^{a b c}, Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 3.3: RPTs and corporate governance before the Share Structure Reform

This table shows the regressions about the association between RPTs and corporate governance in year 2004, the year before the Share Structure Reform. We consider two types of RPTs: operating RPTs and net loan guarantees received. Operating RPTs are scaled by sales; net loan guarantees received are scaled by Total Assets. Dummy variable “*WhetherBorH*” is equal to 1 for companies with either B or H shares. Dummy variable “*WhetherBigFour*” is equal to 1 for companies whose annual reports were audited by the largest four international accounting companies. Dummy variable “*WhetherGroup*” is equal to 1 for companies that are controlled by groups. Proportion of institutional holding is defined as the ratio of shares held by all institutional investors to all outstanding tradable shares. We control for some firm characteristics, e.g. size, M/B ratio, leverage and ROE. The M/B ratio is measured as (market value of tradable shares + # of non-tradable shares*equity per share) / total equity. There are totally 1253 non-financial firms at the beginning of year 2004. We exclude those firms with non-positive total equity and those without available data of some variables. 1185 firms are used in the regressions.

(Table 3.3 continued)

Model	Operating related party trans.			Net loan guarantee received		
	1	2	3	4	5	6
Intercept	-0.79 ^a -3.95	-0.55 ^a -2.94	-0.62 ^a -3.11	0.09 1.24	0.15 ^b 2.10	0.17 ^b 2.26
WhetherBorH	-0.06 ^a -2.49	0.01 0.64	-0.02 -0.75	-0.03 ^a -2.69	-0.01 -1.40	-0.01 -0.89
WhetherBigFour	-0.05 ^b -2.01	-0.04 ^c -1.82	-0.04 ^c -1.85	-0.02 ^a -2.58	-0.02 ^a -2.53	-0.02 ^b -2.30
Prop_non-tradable	0.29 ^a 4.87		0.14 ^b 2.20	0.04 ^c 1.61		-0.02 -0.78
Top10_tradable / Non-tradable	0.09 1.53		0.10 ^c 1.68	0.02 0.64		0.02 0.75
Prop_controlling		0.32 ^a 5.84	0.21 ^a 5.36		0.08 ^a 3.19	0.09 ^a 4.74
Top2-5 / Top1		0.03 ^c 2.43			-0.00 -0.09	
WhetherGroup	0.05 ^a 4.68	0.04 ^a 3.63	0.04 ^a 3.73	-0.00 -0.90	-0.01 ^c -1.79	-0.01 ^c -1.86
Prop_institutions	-0.17 ^c -1.81	-0.09 -1.19	-0.17 ^c -1.81	-0.05 -1.30	-0.03 -0.99	-0.05 -1.33
Board size	0.00 0.08	0.00 0.61	0.00 0.54	-0.002 ^c -1.62	-0.00 -1.19	-0.00 -1.16
# of Independent director	0.01 0.99	0.01 1.15	0.01 1.15	0.004 1.25	0.005 1.34	0.00 1.44
Size of board of supervisors	0.01 1.57	0.01 1.50	0.01 1.48	-0.003 ^c -1.65	-0.003 ^c -1.82	-0.003 ^c -1.80
size	0.03 ^a 3.60	0.02 ^a 2.46	0.02 ^a 2.61	-0.004 -1.11	-0.007 ^b -2.16	-0.008 ^b -2.28
M/B	0.01 1.16	0.01 1.38	0.01 1.37	-0.01 -1.44	-0.01 -1.21	-0.01 -1.29
Leverage	-0.15 ^a -3.74	-0.12 ^a -3.12	-0.13 ^a -3.26	0.07 ^a 4.96	0.08 ^a 5.62	0.08 5.59
ROE	-0.08 -1.50	-0.08 -1.44	-0.09 ^c -1.67	0.04 1.35	0.03 1.26	0.03 1.23
Adj. R ²	0.086	0.106	0.107	0.031	0.048	0.048
# obs.	1185	1185	1185	1185	1185	1185

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 3.4: RPTs and firm value before the Share Structure Reform

This table shows the regressions about the association between RPTs and firm value in year 2004, the year before the Share Structure Reform of some firms. We consider two types of RPTs: operating RPTs and net loan guarantees received. Dummy variable “*WhetherRPT*” is equal to one for firms with non-zero operating RPTs. Dummy variable “*WhetherPositive*” is equal to one for firms that receive positive net loan guarantees. The corporate governance measures are defined in the same way as in Tables 3.2 and 3.3.

Model	Operating RPTs and Tobin's Q		Loan guarantees and Tobin's Q	
	1	2	3	4
Intercept	3.68 ^a 19.18	4.26 ^a 17.50	3.71 ^a 19.28	4.27 ^a 17.55
size	-0.11 ^a -12.19	-0.14 ^a -11.86	-0.12 ^a -12.55	-0.14 ^a -11.98
WhetherRPT	-0.02 ^c -1.61	-0.01 -0.70		
WhetherPositive			-0.01 -1.18	-0.01 -1.01
WhetherBorH		-0.14 ^a -8.17		-0.14 ^a -8.39
WhetherBigFour		0.04 ^b 2.13		0.04 ^b 2.18
Prop_controlling		-0.29 ^a -4.11		-0.29 ^a -4.10
Top2-5 / Top1		-0.07 ^a -3.78		-0.07 ^a -3.82
WhetherGroup		0.02 ^b 1.98		0.02 ^c 1.89
Prop_institutions		0.71 ^a 8.94		0.71 ^a 8.98
Board size		-0.001 -0.25		-0.001 -0.23
# of Independent director		-0.002 -0.19		-0.001 -0.19
Size of board of supervisors		0.01 1.22		0.005 1.17
Leverage	-0.06 -1.38	-0.02 -0.49	-0.05 -1.17	-0.02 -0.36
ROE	0.40 ^a 5.90	0.30 ^a 4.43	0.40 ^a 5.87	0.30 ^a 4.44
Adj. R2	0.237	0.310	0.236	0.310
# obs.	1284	1185	1284	1185

Table 3.5: Changes in RPTs before and after the Share Structure Reform

This table shows whether the Share Structure Reform affects the pattern of RPTs. We divide the 1314 non-financial firms into two groups. One group consists of 228 firms which completed reforms before Jan 1st, 2006. The other group consists of the remaining 1086 firms which were still in the process of reforms or did not start reforms yet in year 2006. Panel A reports the changes in share structures from 2004 to 2006 for the two groups. Mean and median changes are computed across the two groups respectively. t and Wilcoxon tests are conducted to test the significance of the differences between the two groups. Panel B reports only the mean changes in total operating RPTs. Panel C reports the mean changes in net loan guarantees received from related parties. For every type of RPTs, we report changes in total amounts, number of transactions and amounts scaled by both total sales and total assets. The total amounts are reported in millions.

Panel A: Change of share structures from year 2004 to year 2006				
		Firms which completed reforms	Firms which have not completed	test statistics
	# obs.	228	1086	
Proportion of non-tradable shares	mean	-10.16%	-0.64%	-26.18 ^a
	median	-10.71%	0.00%	-23.81 ^a
Prop. of shares held by Top 10 tradable	mean	-2.90%	2.19%	-7.98 ^a
	median	-1.84%	0.76%	-8.34 ^a
Prop. of shares held by controlling shareholder	mean	-8.31%	-1.01%	-12.22 ^a
	median	-8.75%	0.00%	-17.59 ^a
Prop. of shares held by institutions	mean	7.33%	3.49%	3.36 ^a
	median	0.83%	0.00%	4.63 ^a

Panel B: Change of total operating related party transactions from year 2004 to year 2006				
		Firms which completed reforms	Firms which have not completed	test statistics
	# obs.	228	1086	
Total amount		177.37	100.81	1.60 ^c
# of transactions		2.29	1.23	2.38 ^b
Amount scaled by sales		1.05%	0.77%	0.24

Panel C: Change of net related party loan guarantees received from year 2004 to year 2006				
Total amount		116.89	44.89	2.74 ^a
Amount scaled by assets		3.21%	-1.70%	1.36

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 3.6: Proportion of firms with increased RPTs

This table also shows whether the Share Structure Reform affects the pattern of RPTs. We divide the 1314 non-financial firms into two groups. One group consists of 228 firms which completed reforms before Jan 1st, 2006. The other group consists of the rest 1086 firms which were still in the process of reforms or did not start reforms yet in year 2006. For every group, we compute the proportions of firms with positive changes in RPTs from 2004 to 2006 to the total number of firms in that group. We do two-sample t-test to compare the proportions of the two groups. Different panels report the proportions and test statistics for different types of RPTs. For every type of RPTs, we report the proportions of firms with increased total amount, number of transactions, amount scaled by sales and amount scaled by assets.

Panel A: Change of total operating related party transactions from year 2004 to year 2006			
	Firms which completed reforms	Firms which have not completed	test statistics
# obs.	228	1086	
Total amount	64.04%	50.09%	3.96 ^a
# of transactions	55.26%	43.00%	3.39 ^a
Amount scaled by sales	49.12%	42.45%	1.84 ^c
Panel B: Change of related party loan guarantees received from year 2004 to year 2006			
Total amount	44.74%	32.41%	3.44 ^a
# of transactions	40.79%	31.77%	2.54 ^a
Amount scaled by assets	41.23%	31.95%	2.61 ^a
Panel C: Change of related party loan guarantees offered from year 2004 to year 2006			
Total amount	17.98%	18.23%	-0.09
# of transactions	17.54%	17.31%	0.08
Amount scaled by assets	17.98%	18.23%	-0.09
Panel D: Change of net related party loan guarantees received from year 2004 to year 2006			
Total amount	46.05%	34.53%	3.20 ^a
Amount scaled by assets	42.54%	33.52%	2.53 ^a

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 3.7: RPTs and firm value after the Share Structure Reform

This table shows the regressions about the association between RPTs and firm value in year 2006, the year after the Share Structure Reform of some firms. We exclude those firms with negative total equity and those firms with missing values in some variables. 1213 firms are used to run the regressions. We consider two types of RPTs: operating RPTs and net loan guarantees received. Dummy variable “*WhetherRPT*” is equal to one for firms with non-zero operating RPTs. Dummy variable “*WhetherPositive*” is equal to one for firms that receive positive net loan guarantees. To examine the effect of the Share Structure Reform on the impact of RPTs, we use dummy variables to divide the whole sample into four sub-samples: the firms that completed reforms and conducted non-zero operating RPTs (or receive positive net loan guarantees); the firms that completed reforms and conducted zero operating RPTs (or receive non-positive net loan guarantees); the firms that have not completed reforms and conducted zero operating RPTs (or receive non-positive net loan guarantees); and the firms that have not completed reforms and conducted non-zero operating RPTs (or receive positive net loan guarantees). We use the last group of firms as benchmark firms. For all the regressions, we control for corporate governance. The corporate governance measures are defined in the same way as in Tables 3.2 and 3.3.

(Table 3.7 continued)

Model	Tobin's Q versus Operating RPTs		Tobin's Q versus Loan guarantees	
	1	2	3	4
Intercept	4.96 ^a 18.11	4.95 ^a 17.92	4.95 ^a 18.25	4.94 ^a 18.28
size	-0.17 ^a -11.92	-0.17 ^a -11.95	-0.17 ^a -12.03	-0.17 ^a -12.02
WhetherRPT	0.01 0.35			
Dummy for firms that completed reforms and conducted non-zero operating RPTs		-0.01 -0.36		
Dummy for firms that completed reforms and conducted zero operating RPTs		0.08 1.12		
Dummy for firms that have not completed reforms and conducted zero operating RPTs		-0.03 -1.19		
WhetherPositive			-0.02 -1.15	
Dummy for firms that completed reform and receive positive net loan guarantees				-0.02 -0.58
Dummy for firms that completed reform and receive non-positive net loan guarantees				0.05 1.27
Dummy for firms that have not completed reform and receive non-positive net loan guarantees				0.01 0.49
Leverage	-0.11 ^c -1.72	-0.10 ^c -1.63	-0.10 -1.54	-0.10 -1.48
ROE	0.55 ^a 5.07	0.54 ^a 5.06	0.55 5.16	0.55 ^a 5.19
Corporate Governance Control Variables	Omitted	Omitted	Omitted	Omitted
Adj. R2	0.342	0.343	0.343	0.343
# obs.	1213	1213	1213	1213

^{a, b, c} Coefficient is significant at the 0.01, 0.05 and 0.10 levels.

Table 3.8: Announcement effect before and after the Share Structure Reform

This table shows the market reactions to the announcement of RPTs before and after the Share Structure Reform. For every announcement of every firm, we firstly estimate coefficients of the market model. We use an estimation period of 200 trading days, from day -210 to day -11, relative to the date of the announcement, day 0. We use the value-weighted average return of all stocks in both Shanghai and Shenzhen Stock Exchanges as market return. We then compute abnormal returns on day -2, through day 3 based on the estimated coefficients for every announcement event. Average abnormal return for specific event window is defined as the summation of daily abnormal returns divided by number of days in that event window. Mean average abnormal returns are computed across the announcements in pre- and post-reform periods respectively. We conduct t tests to statistically compare the mean average abnormal returns in the two periods. We use 511 announcements of 228 firms that completed reforms before Jan 1, 2006. We report the average abnormal returns for the whole sample and three equal-size sub-samples sorted by the nearest year-end institutional holding before the announcements.

		Window (-2, 2)			Window (-1, 2)			Window (-2, 3)			Window (-1, 3)		
		Before reform	After reform	Diff.	Before reform	After reform	Diff.	Before reform	After reform	Diff.	Before reform	After reform	Diff.
All sample	# of obs.	291	220										
	Mean	-0.13% ^c	-0.02%	-0.11%	-0.14% ^c	0.01%	-0.15%	-0.12% ^b	-0.03%	-0.09%	-0.13% ^c	-0.02%	-0.11%
	t-stat.	(-1.92)	(-0.22)	(-1.00)	(-1.73)	(0.11)	(-1.09)	(-2.07)	(-0.33)	(-0.97)	(-1.87)	(-0.20)	(-0.94)
High institutional holding	# of obs.	97	74										
	Mean	-0.28% ^b	0.09%	-0.37% ^c	-0.28% ^b	0.12%	-0.40% ^c	-0.26% ^b	0.08%	-0.34% ^c	-0.27% ^b	0.09%	-0.36% ^c
	t-stat.	(-2.24)	(0.58)	(-1.91)	(-1.99)	(0.61)	(-1.70)	(-2.30)	(0.56)	(-1.92)	(-2.11)	(0.53)	(-1.73)
Medium institutional holding	# of obs.	97	73										
	Mean	-0.03%	0.04%	-0.07%	-0.03%	0.06%	-0.09%	-0.04%	-0.03%	-0.01%	-0.03%	-0.04%	0.01%
	t-stat.	(-0.25)	(0.24)	(-0.34)	(-0.19)	(0.31)	(-0.36)	(-0.32)	(-0.18)	(-0.04)	(-0.24)	(-0.23)	(0.04)
low institutional holding	# of obs.	97	73										
	Mean	-0.08%	-0.19%	0.11%	-0.11%	-0.15%	0.04%	-0.08%	-0.13%	0.05%	-0.10%	-0.11%	0.01%
	t-stat.	(-0.73)	(-1.25)	(0.60)	(-0.82)	(-0.77)	(0.18)	(-0.88)	(-0.95)	(0.31)	(-0.88)	(-0.65)	(0.06)

^{a b c} , , Coefficient is significant at the 0.01, 0.05 and 0.10 levels.