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STOCK MARKET EFFICIENCY IN CHINA: EVIDENCE FROM THE SPLIT-SHARE REFORM

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Abstract

We perform an event study to investigate the efficiency of the Chinese stock market. We study the reaction of stock returns and trading volumes to the 2005-2006 structural reform which allowed the transformation of non-tradable shares (NTS) into tradable shares (TS) through payment of a compensation to holders of TS. We find evidence of positive abnormal returns in the few days before the announcement of which companies will undergo the reform process and in the ten days after the readmission to trading of participating companies following the determination of the compensation, but no abnormal returns after the payment itself. From a methodological viewpoint, our contribution is the introduction of a bootstrap procedure that is designed to replicate the actual degree of covariance across firms.

JEL Classification: G14, N25.
Keywords: Chinese stock market, market efficiency, event study, bootstrap.

Contents

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1 Introduction

The efficiency of the Chinese stock market is a very important issue given its large capitalization ($3.9 trillion at end January 2014) and China's rapid growth. One of the main functions of the stock market is to improve the allocation of capital by signaling its relative scarcity in different sectors via equity prices. This crucial purpose may be attained only if prices are valuation efficient. In this paper we assess valuation efficiency by studying price reactions to a recent stock market reform, through an event study. This methodology is particularly useful given that the Chinese stock market only opened in 1991 (with a small number of traded companies representing a severe limitation in respect of statistical methods that require long time-series to produce reliable estimates. Moreover, as reported by Carpenter et al. (2014), the Chinese stock market has experienced a sequence of structural breaks associated with different institutional and regulatory reforms. Time-series models are not suited to dealing with structural breaks, unless the dates of the break are known and specific corrections are implemented. Instead, we take a different approach and exploit the cross-sectional pricing implications of the 2005-2006 transformation of non-tradable shares (NTS) into tradable shares (TS) to study efficiency.

The reform entailed a process whereby NTS holders paid compensation to TS holders in exchange for the right to sell their shares in the future. Compensation is consistent with the idea that the transformation of NTS into TS may damage the current TS holders, who in the past decided to hold shares under the assumption that NTS would have never been turned into TS (see Chen and Xiong, 2001). After successful initial experiments with a small number of firms, in August 2005 the Chinese authorities extended the reform to all companies listed in the Shanghai and Shenzhen markets, setting the end of 2006 as the deadline for its completion. Each participating company had to respect a schedule implying two trading suspensions and subsequent readmissions. The first suspension predated the announcement of the value of the compensation to be paid to holders of TS, the second suspension took place before the actual payment. Typically (almost 80% of the cases) compensation was represented by the transfer of shares from NTS holders to TS holders. In theory this form of compensation does not affect a company's market valuation. However, if the demand function is downward sloping, there can be negative effects on the price of the shares associated with an increase in supply, or positive effects associated with the increased liquidity and visibility of the stocks. We carry out an event study and measure the cumulative abnormal returns (CARs) of stocks as well as turnover, to understand whether the stock price reaction was roughly consistent with these rational models of pricing behavior.

Our main findings are as follows: risk-adjusted stock prices increased both in the days immediately prior to the first suspension (by more than 2%) and in the ten days after the first readmission (about 1.7%). Prices fell after the end of the reform, but compensation-corrected abnormal returns were not statistically different from zero for the subsequent ten-day period. Turnover increased substantially in all the event periods, particularly after the second readmission. Our findings are coherent with the existence of inside information about the identity of the participating companies, because a risk premium would not suddenly materialize on the day/four days before the first announcement. The increase in the price after the first readmission may be due to a decrease in expected returns associated with expectations of improved liquidity and/or to the existence of a visibility (Merton) effect. It is noteworthy that prices show no abnormal pattern after the end of the reform. The results are robust to a variety of tests, notably the estimation of a multi-factor model for the Chinese stock market.

The selection of a CARs methodology rather than a regression-based methodology (for an extended comparison see Kothari and Warner, 2005), is due to the specificity of our data. The reform was implemented through two periods of trading suspension for each stock. It was therefore impossible to estimate a linear regression involving dummy variables that control for the change in the intercept during the event periods. Moreover, the set-up of the reform required careful treatment of cross-sectional correlation across firms. Hein and Westfall (2004) deal with bootstrap methods to improve statistical testing in the presence of clustering when using the multivariate regression model. Lyon, Barber and Tsai (1999) suggest a bootstrap version of a skewness-adjusted t-statistic to control for the skewness in their tests of long-run abnormal returns in a CARs setting. We also used a bootstrap methodology to make our statistical inference robust to the presence of clustering.

Our paper differs from previous studies. We neither study the relation between bubbles and speculation, as in Mei, Scheinkman and Xiong (2009), nor do we consider the cross-section of stock returns from a predictive viewpoint, as in Baker and Wurgler (2006). Instead, we consider company-specific event windows, involving periods of trading and non-trading, and examine whether the reaction of prices to well-identified announcements and corporate actions is compatible with market efficiency. Several papers have looked at the efficiency of the Chinese and Asian stock markets, applying various methodologies (see Charles and Darné, 2009, for a list of contributions). Kim and Shamsuddin (2008) test for the martingale hypothesis in the stock prices and find weak-form efficiency for Hong Kong but inefficiency for other Asian stock markets. Charles and Darné (2009) apply the variance ratio

test to the Chinese market and find that B-shares are significantly inefficient although A-shares seem more efficient. Groenewold, Tang and Wu (2003) study the predictability of returns and find deviations from market efficiency; evidence of predictability of stock returns is also found in the presence of volatility clustering by Chen and Hong (2003). Gao and Kling (2005) find evidence of calendar effects in the Chinese market with excess returns in March and in April and on Fridays, while Chong, Lam and Yan (2011) study the profitability of trading strategies and suggest that China's stock market has become more efficient since the reform. DeBondt et al. (2010) identify booms and busts using a fundamental-based model. Chen et al. (2010) look at a variety of characteristics drawn from the literature and show that their predictive ability is weaker than in the U.S.A., which they interpret as evidence of persistent mispricing. Carpenter et al. (2014) argue that the Chinese stock market is increasingly able to provide stock price informativeness and is characterized by anomalies resembling those prevailing in the U.S. market.

Several other papers study the split-share reform. Lu, Balatbat and Czernkowski (2012) examine the reaction of prices both to the reform's general announcement and the company-specific announcements, with particular regard to compensation characteristics for a sample of firms. Li, Wang, Cheung and Jiang (2011) study the reform on the basis of a general equilibrium model explaining compensation on the basis of company and shareholders characteristics; Haveman and Wang (2008) also discuss the struggle to reach agreement among different types of shareholders. Liao, Li, Liu and Wang (2011) study what happens to prices on the day of the lockup expiration and Huang, Su and Ching (2008) apply structural break tests to prices before and after the reform. Our paper is different: we study all Chinese stocks and consider all the different phases of the reform. Moreover we assess the data's relevance to the study of asset pricing and efficiency.

Section 2 discusses the Chinese stock market, describes the reform process and the theoretical behavior of prices of the participating companies. Section 3 describes the methodological issues, the structure of the event study and the empirical results. Section 4 concludes.

2 The reform of the Chinese dual-share structure

Chinese firms typically issue multiple classes of shares. The existence of multiple classes of shares (A-shares, B-shares, overseas listed shares, legal-person shares, State shares) can be traced back to the restructuring of State-Owned Enterprises (SOEs) in the 1990s and to the related interest on the part of the State of not relinquishing total control of

firms. Until 2003, A-shares could only be traded by domestic investors. Since then the possibility of trading domestic renminbi-denominated securities has been extended to Qualified Foreign Institutional Investors (QFII) and RMB Qualified Foreign Institutional Investors (RQFII), though with some limitations.[1] B-shares are denominated in foreign currencies and until February 2001 were reserved to foreign investors.[2] Overseas listed shares are issued by Chinese companies on securities markets outside mainland China (i.e. H-shares listed in Hong Kong, N-shares listed in New York, L-shares listed in London, and S-shares listed in Singapore). Legal-person shares have been given to domestic institutions, most of which are partially owned by the central or local government. State shares are owned by the State Council. Legal-person shares and State shares are together known as non-tradable shares. At the beginning of 2006, NTS accounted for about 63% of the total number of shares outstanding. NTS have the same cashflow and voting rights as TS.

Since the mid-1990s it has been possible to transfer NTS through irregularly scheduled auctions and over-the-counter transactions. According to Green and Black's (2003) analysis of 840 transactions in the Shenzhen market in the period 1994-2003, such transfers often involved large blocks of shares affecting the control of companies. The dominant sellers were State-controlled shareholding companies and the dominant buyers were private companies. In 2001 and 2002 the deals associated with a change in control amounted to 32% and 46% respectively. Chen and Xiong (2001) find a large discount (price of NTS as a ratio of TS price) averaging about 80%. The discount is lower for large firms, firms with a high return on equity, firms with high earnings-price or book-price ratios, firms with low debt-equity ratios, and firms with low stock return volatility.

On 29 April 2005 the China Securities Regulatory Commission (CSRC) announced a pilot program to transform NTS into TS. In its final version, the reform involved two suspension periods for each company. During the first suspension period NTS holders discussed a compensation proposal to be submitted to the TS holders. The company then published a notice providing full details of the proposal to shareholders. Once the shares resumed trading, no further revisions could be made to the proposal submitted for shareholder approval. The shares were then suspended for a second time after the closing date of

[1] There is a limit to the breadth of the regulation in that (i) an individual QFII may not hold more than 10% of the total outstanding shares of any single listed company and (ii) in any single listed company, the total combined shares held by all QFIIs may not exceed 30% of the total outstanding shares of the listed company.
[2] Chinese investors must use the foreign exchange reserve in their banking accounts to buy B-shares. Overall, the market capitalization of B-shares was about 3% of the capitalization of A-shares in 2005.

registration for participation at the shareholders' meeting. Trading was resumed after the meeting ratifying the completion of the reform process. At the same time compensation was paid. The reform proposal was approved if (a) at least two-thirds of the combined votes of NTS holders and holders of A-shares were in favor (b) at least two-thirds of the votes cast by holders of A-shares who participated in the meeting were in favor.

Compensation to TS holders could be paid in various ways: (a) through new shares offered directly by NTS holders, (b) new shares offered by the company, (c) cancellation of shares on the part of NTS holders, (d) compensation in cash or warrants. Offers were usually expressed as a percentage of 10 originally held TS. The typical case (79.1% of the cases) involved a direct transfer of shares: on average TS holders got 3.12 shares for every 10 shares originally held. The second most popular method (8.9%) involved new issues assigned to TS holders only. In this case TS holders got on average 5.90 shares for every 10 shares originally held.

Companies took part in the reform in various batches.[3] There were four companies in the first batch. On 17 June 2005 the CSRC initiated the second round of the program, involving 42 companies. On August 19, this second round was concluded. On August 24, the government issued guidelines to extend the reform project to the rest of the stock market, setting a deadline for the end of 2006. Figure 1 shows the timing of the various batches as well as the number of companies included in each batch, highlighting how they have been rather regular both in terms of timing (2-3 batches every month) and in terms of the number of companies (about twenty in each batch) since October 2005.[4] On February 2007, 1.301 listed companies had either completed or initiated their NTS reform process.

[INSERT FIGURE 1 HERE]

The crucial phases of the reform implementation were: (i) the initial announcement for all the companies at time t^0 (24 August 2005), (ii) the suspension of trading for company i at time t_i^1, (iii) at time t_i^2 the company's readmission to trading, along with an announcement

[3] See Wan, Yuan and Ha (2005), Inoue (2005) and Jingu (2006) for detailed accounts of the institutional aspects of the reform process.

[4] In order to provide further incentives for companies to participate in the reform, the CSRC stated that reform-compliant companies would be given priority to raise new capital (new issues of shares and IPOs had been frozen since April 2005). To facilitate the reform, the Chinese government has also taken a series of measures to help stabilize the stock market. The legislative department also amended the Company Law and the Securities Law to perfect the legal framework governing the capital market. At the end of January 2006 there was a further rule change making it easier for strategic investors to buy stakes in listed companies; under the new rules the purchase of A-shares is no longer reserved to a small group of qualified investors but is extended to all investors willing to buy a minimum stake of 10% of the company and hold the shares for more than three years.

about the size of the compensation, (iv) the company's second suspension from trading at time t_i^3, (v) payment of the compensation and readmission of the company to trading at time t_i^4. The path of rational prices of TS should be: (i) prices react to expected compensation as well as to expected changes in fundamentals at t^0. (ii) Between t^0 and t_i^1, prices react to revisions in expectations of compensation and other fundamentals. In a demand-supply framework prices may immediately drop due to the expectation of a positive supply shock in the future. In a present discounted value model framework prices may immediately increase due to the expectation of a positive liquidity shock that reduces the expected return. Prices may also decrease to allow for compensation risk, which implies the existence of a positive drift as a remuneration for such risk. There should be no other reasons for price changes, as all the relevant information (for example the negotiation power between NTS holders and TS holders) is known at t^0. (iii) At t_i^2, prices react to any compensation surprise. (iv) Nothing happens between t_i^2 and t_i^3 as no new information is released and there is no further risk. In principle, there is some risk between the day of the public announcement of the compensation and the day on which the shareholders meet to formally approve the reform package. However in practice there was no occurrence of shareholders rejecting the proposal. This can be explained on the basis of the high costs of not accepting a proposal that had been discussed and informally approved during the first suspension period. (v) Prices drop by the amount of compensation at t_i^4, making the corporate action equivalent to a split when compensation is paid by assignment of new shares.[5] Prices may also move due to supply and liquidity increasing.

3 Empirical analysis

3.1 Methodological issues

The event study uses residuals from a pricing model. The pricing model is estimated using observations between $t_i^1 - 120$ and $t_i^1 - 10$ [6], where t_i^1 is the day of the first suspension for stock *i.* The trading suspension prevents us from using a regression methodology that tests

[5] In the literature the split is considered to be a signal of insider information on the part of the managers (see McNichols and Dravid, 1990). In keeping with the signaling hypothesis, Ikenberry and Ramnath (2002) show that positive abnormal returns after a split are consistent with a positive revision of corporate profitability on the part of investors.

[6] We have also experimented with other estimation periods ($t_i^1 - 150$ and $t_i^1 - 10$, $t_i^1 - 90$ and $t_i^1 - 10$) but the results are not affected.

for the significance of a dummy variable in a regression also using event period data. The estimated parameters, $\hat{a}$ and $\hat{b}$, are used to compute cumulative abnormal returns (CARs) in the event windows.

We will now consider simple CAPM-adjusted returns, while the following section will deal with robustness analysis, allowing the estimation of multi-factor models. For all event windows, cumulative abnormal returns are averaged across companies to obtain the mean cumulative abnormal residuals (MCARs).

We measure the variance of MCARs in three ways. Following Campbell, Lo and MacKinlay (1997), under the assumption of independence across abnormal residuals ε_i of different firms, the variance of *MCARs* is:

$$Var(MCAR_T) = N^{-2}\sum_{i=1}^{N} V_i \; ; \tag{1}$$

where:

$$V_i = i'\left(\sigma_{\varepsilon_i}^2 I + \sigma_{\varepsilon_i}^2 X_i^*(X_i'X_i)^{-1}X_i^{*'}\right)i \; ; \tag{2}$$

is the variance of the *i*-th company (composed of a first term that accounts for the variance of abnormal returns and a second term that allows for estimation error), X_i (X_i^*) is the matrix of regressors used in the estimation period (the event window) and *i* is a vector of ones. We define this estimated variance as CLM variance. The null hypothesis of no abnormal returns is tested by means of the statistic:

$$J_t = \frac{MCAR_T}{\sqrt{Var(MCAR_T)}} \; ; \tag{3}$$

which is asymptotically distributed as a standard normal. The disadvantage of this estimator lies in its assuming independence of residuals across firms. Our event periods are occasionally overlapping across firms because the latter are divided into batches of companies going through the reform process within similar time frames. Campbell, Lo and MacKinlay (1997) discuss inference in event windows with clustering and notice that standard methods suffer from lack of power. We therefore compute two other estimators.

The second estimator is the cross-sectional variance (CS variance) across mean cumulative and average abnormal returns of the various companies (see Asquith, 1983and Lynch and Mendenhall, 1997). Campbell, Lo and MacKinlay (1997) point out that the use of the CS variance is justified under the weaker assumption of cross-sectionally uncorrelated residuals. Finally, Brown and Warner (1985) point out that the CS variance is robust to the possibility of increases in the variance of the securities during the event periods. The third

estimator is obtained by bootstrapping abnormal returns in such a way as to preserve their cross-correlation properties. For all the companies involved in the reform process we estimate a market model over a common estimation period (bootstrap estimation period). This includes 140 observations prior to 16 September 2004, an uneventful period preceding the start of the reform. Estimation of the market model over the same period allows us to retrieve a matrix of residuals respecting typical covariation across stocks in a period without the introduction of any reform.

We denote with $a_i^{(b)}, b_i^{(b)}$ (for companies *i=1,2...N*) the parameters estimated over the bootstrap estimation period:

(4) $$ar_{i,t} = r_{i,t} - a_i^{(b)} - b_i^{(b)} r_{M,t}\,.$$

In order to describe our bootstrap, we assume that there are only three firms, A, B and C, which are readmitted to trading respectively on 10 January, 15 January and 5 March 2006. In the event study we analyze their cumulative average abnormal returns over the periods 10-20 January, 15-25 January and 5-15 March. Firms A and B have a five-day overlap. Suppose we have estimated a market model for these three companies using data for the year 2005. We extract a (randomly selected) block of 10 consecutive observations from the cumulative abnormal residuals of A's stocks over the year 2005. We do that by randomly selecting a number between 1 and 241, say number *k*, from a uniform distribution and by considering the sequence of 10 residuals between *k* and *k+9*, selected from the bootstrap estimation period. In order to respect the cross-sectional dependence between companies A and B we then consider a sequence of 10 residuals for firm B between *k+5* and *k+14*. In this way there is a five-day overlap in bootstrapped residuals, corresponding to the overlap that takes place among residuals in event windows. As to firm C, we consider 10 residuals from the bootstrap estimation period between *j* and *j+9*, where *j* is another number randomly extracted from a uniform distribution between 1 and 241 (excluding k and k+14), because there is no cross-correlation to account for. We now have three artificial time-series of abnormal residuals for the three stocks, allowing for cross-sectional covariance among them. We repeat the procedure for all the firms and obtain a simulated series of abnormal returns under the null hypothesis respecting all the overlaps existing among all firms. We run the procedure 1,000 times and compute an empirical distribution of mean cumulative residuals, which is then used to carry out statistical inference about the value of MCARs obtained in our sample of data.

3.2 Data and summary statistics

We used three sources of data for our empirical work: DataStream, Shenzhen GTA Information Technology Co Limited and the data kindly provided by the Nomura Institute of Capital Market Research. Our original sample involved 1,440 companies but not all the data could be used for various reasons: (a) 62 companies closed before the beginning of the reform process, (b) 17 companies were suspended from trading as of February 2007 for unspecified reasons, (c) 26 companies were set up after September 2005, (d) 5 companies did not have NTS before the start of the reform process. This left us with a sample of 1,330 companies, 1,301 of which embarked on the reform process with 1,192 finishing the reform by February 2007. This sample was then reduced again: in 94 cases we had problems in pricing the compensation paid to shareholders and in another 91 cases the data were not fully convincing because of discrepancies across data sets in the percentage of TS held before and after the reform. Excluding these 185 companies left us with a sample of 1,007 completing the reform process by February 2007.

To correct for payment of the compensation we assume that the total wealth of tradable shareholders does not change when the compensation is paid, i.e.

$$p_0 QTS = p_1 [QTS + QTS \times SH] + QTS \times CASH , \tag{5}$$

where p_0 is the price before the compensation payment, p_1 is the price after the payment, *QTS* is the number of TS outstanding at the beginning of the reform process, *SH* is the number of shares that are transferred to TS holders and *CASH* is the cash compensation.[7] Few companies have paid compensation by assigning warrants. We have computed the theoretical price of warrants on the basis of the methodology proposed by Galai and Schneller (1978).

3.3 Qualitative characteristics of companies in the various batches of the reform

Table 1 reports some summary statistics for ten groups of companies participating in the reform process, roughly corresponding to company deciles.

[INSERT TABLE 1 HERE]

The first group includes 4 batches[8] and 120 companies, the second group includes 7 batches and 130 companies, and so on. Batches usually include a substantial number of companies, except for the first experimental batch, which only included 3 companies, and the latest

[7] This is not inconsistent with the existence of a compensation-induced increase in wealth of TS holders. However this wealth increase occurred when market prices incorporated the compensation expectation after the formal announcement, several days before the second readmission.

[8] We leave out the first two experimental batches from our analysis.

batches of our sample, which include several companies that had not completed the reform by February 2007. As figure 1 shows, the reform process continued without interruption for the period under consideration. Column 4 reports the length of the first suspension, a crucial period because shareholders had to agree on compensation. Greater length may signal the increasingly difficult process of reaching consensus by different classes of shareholders.

We analyze several characteristics of the various batches and present them in the remaining columns of the table. The percentage of legal shares (column five) decreases almost monotonically across batches. Existing evidence of positive correlation between legal shares and firm productivity, presented by Sun and Tong (2003), raises the possibility that the government tried to start the reform with better quality companies. The percentage of NTS (column six) does not seem to change across batches. More revealing is the analysis of compensation characteristics (column 7), i.e. the percentage of TS assigned to holders of NTS: average compensation is large for the first six batches, then decreases slightly and stays constant for a few batches and then, starting from batch thirty-one, decreases steadily.

The remaining columns provide information about economic and financial characteristics. In relevant cases we compute the same characteristic both before the beginning of the reform (average value in the year before August 2005) and during the reform period (from August 2005 until the day of the first suspension). Both size and the dividend ratio decrease with batch numbers. The pre-reform bid-ask spread, a rough indicator of illiquidity, increases with the batch number. We also compute (but do not report in the table) a second illiquidity indicator, due to Amihud (2002), as the ratio between absolute returns and the remnimbi volume. This indicator also increases with the number of batches and shows that illiquidity differentials among companies belonging to early and late batches are very large before the reform but decrease substantially thereafter. This is coherent with the reform having a positive impact on liquidity. The price range (the difference between the maximum and minimum price on a given day) slightly increases across batches (see columns 12 and 13).

3.4 Price reactions

Figure 2 describes the price of one specific company (Baotou Huazi Intl) before, during and after the reform. In this example, the stock price goes up before the first suspension, and again between the first and the second suspension.

[INSERT FIGURE 2 HERE]

There is an upward jump on the day of the first readmission and a downward jump on the day of the second readmission. This pattern was frequent across companies.

Table 2 and figure 3 report results of the CARs analysis for the 1,007 companies included in our sample.

[INSERT TABLE 2 HERE]

[INSERT FIGURE 3 HERE]

In the ten days before the first suspension abnormal prices increase by 2.20%, most sharply in the three days before each announcement. Cumulative returns are statistically significant if evaluated by means of t-tests, but are not significant, except for the last one, if judged on the basis of the bootstrap. This is not consistent with a risk explanation, as one would expect a positive risk premium to hold continuously throughout the period before the first readmission and any readjustment of prices due to expected demand/supply or liquidity factors to take place earlier than before the first suspension. Instead, we observe significant abnormal returns only two days before the announcement. The evidence is more consistent with information leakage/speculation than a risk story.

On the day of readmission there is a further 0.7% abnormal average return, with 67% of the companies showing an increase in the price. After the initial jump upon readmission, prices tend to increase by another (statistically significant) 1.06% in the subsequent nine trading days. While the readmission day abnormal return may be associated with a positive compensation surprise, the subsequent positive abnormal returns are not consistent with efficiency. The Merton (1987) effect, according to which investors limit the securities held in their portfolios to those "they are aware of", may be one explanation for this evidence. Media and investors are likely to be particularly interested in the stocks taking part in the reform process, particularly those that have been readmitted to trading after the first suspension. This may have created an increase in the base of investors. The large increase in the volume of trading, which will be documented in the next section, is coherent with this explanation, and may also have fostered expectations of higher stock liquidity and lower expected returns that are immediately beneficial to stock prices.

On the day of payment of the compensation, the average drop is 16.7%, but compensation-corrected prices obtained from equation (5) are on average 0.35% higher than they were when stocks were last traded before the second suspension. Prices drop 0.73% relative to the market in the ten days that follow. The decrease is significant when clustering is not taken into account but becomes less significant when clustering is allowed for and totally insignificant when the bootstrap is used. Overall, not much happens after the second readmission. This is consistent with the split having no real effects. In the literature the split is considered to be a signal of insider information on the part of managers, see McNichols

and Dravid (1990). In the Chinese case, however, the split is forced by the reform process and it is less likely that managers have used it to provide specific information.

3.5 Volume of trading

Figure 4 reports the daily total volume (number of shares traded on a particular day net of new shares paid as compensation) of the Shanghai and Shenzhen stock markets between March 2004 and February 2007.

[INSERT FIGURE 4 HERE]

The increase in total volume after the beginning of the reform is clearly visible: average volume equals 256 million units before the reform, rising to 649 million units after the reform. Table 3 reports average volume for the stocks participating in the reform process, both as an absolute value and as a share of market volume.

[INSERT TABLE 3 HERE]

The average is reported before, during and after the reform process. The absolute value of volume for the stocks joining the reform process one month before suspension (338 million units, on the Shanghai market) is the simple average across stocks of the daily volume in the four weeks preceding the start of the reform process. The number represents 0.10% of total market volume over the same period. With respect to pre-reform levels, volume increased by 69% in the period after the first readmission (and before the second suspension). The increase is 55% for the Shenzhen market and 78% for Shanghai. Volume increases by 116% in the month after the second suspension (with respect to the volume before the first suspension) for each individual market.

These numbers indicate an increase in trading after the reform. We also analyze abnormal volume, using two different methodologies. The first follows Brav and Heaton (1999) and Brav and Gompers (2003). We define normal volume as the mean daily volume from day $t_i^1 - 120$ through day $t_i^1 - 11$ relative to the day of the first suspension. Abnormal volume is the percentage difference between actual volume and normal volume. To eliminate the effect of outliers, we set observations exceeding the 99th percentile equal to the median observation. Table 4 confirms the large increase in volume.

[INSERT TABLE 4 HERE]

Table 4 shows that ten days before the first suspension actual volume is 14% larger than normal volume, reaching 82% on the day before suspension. On the day of the first readmission, volume is 195% higher than normal, shrinking to 21% after 10 days. On the day

of the second readmission volume is 522% higher than normal, an increase shrinking to 161% after 10 days.[9] There is therefore a clear increase in trading volume both during and after the reform.

The second methodology used to analyze abnormal volume follows Ajinkya and Jain (1989) and Lynch and Mendenhall (1997). Turnover is defined as:

$$\upsilon_{it} = \log[1 + V_{it}] / \log[1 + MV_{it}], \tag{6}$$

where V_{it} is the money volume for stock *i* on day *t* and MV_{it} is the market value of the outstanding shares on stock *i* on day *t*. Abnormal turnover is retrieved from the residuals of a regression of company turnover on market turnover:

$$\upsilon_{it} = \beta_0 + \beta_1 \upsilon_{mt} + \varepsilon_{it}. \tag{7}$$

The regression is estimated by means of generalized least squares.[10] The coefficients of the regression are estimated using observations between times $t_i^1 - 120$ and $t_i^1 - 10$, where t_i^1 is the day of the first suspension for company *i*. The cumulative residual analysis described in table 5 shows that companies entering the reform process have a positive abnormal turnover in the period preceding the first suspension.

[INSERT TABLE 5 HERE]

Turnover keeps increasing relative to the market in all sub-periods after the first readmission. A very strong increase takes place after the second readmission.

Large turnover is frequently associated with mispricing.[11] However, the abnormal return analysis presented in the previous section does not show the existence of mispricing after the second readmission, regardless of the turnover boost. The most likely explanation is that the price increase after the second readmission is associated with the Merton visibility

[9] We take into account the increase in the float after the second readmission.

[10] The equation is estimated on the basis of OLS to retrieve the residuals. The residual is then regressed on its own lag and the slope coefficient is used as an estimate of the AR(1) coefficient to transform the original data as in the Cochrane-Orcutt procedure. Finally, OLS is applied to the transformed data.

[11] Mei, Scheinkman and Xiong (2009) use a panel of 73 Chinese stocks with multiple trading classes; by assuming that one class is fairly priced, they find that stocks that are overvalued are also characterized by larger turnover. In some models, for example Baker and Stein (2004), Hong, Scheinkman and Xiong (2006) and Mei, Scheinkman and Xiong (2009), trading volume is linked to irrational traders and speculative activity. Speculation may spoil the link between prices and fundamentals. Scheinkman and Xiong (2003) and Hong, Scheinkman and Xiong (2008) show that the combination of heterogeneous beliefs and short sale constraints may induce investors to overpay for a stock if they expect to sell it in the future to another investor with an even higher willingness to pay. Speculation is also closely linked with sentiment. Baker and Wurgler (2006) write that "one possible definition of investor sentiment is the propensity to speculate". They notice that shifts in sentiment may carry cross-sectional implications either because some stocks are harder to evaluate in an objective way or because arbitrage is more difficult.

effect and not with pure speculation. It would be hard to explain why simple speculation is at work after the first readmission but not after the second readmission.

3.6 Robustness analysis

We consider various robustness tests regarding: the definition of the market index, the risk model for computing excess returns, alternative structures for our bootstrap, and allowance for non-synchronous trading.

Our previous tests used the Shanghai and Shenzhen market indices, depending on the trading location of each stock. We also compute a float-weighted market index to evaluate the sensitivity of our results to the definition of the market. This is important also in view of the large difference between float and capitalization caused by the existence of NTS. A capitalization index would include the quantity of both TS and NTS to compute the weights assigned to the various stocks and would provide a measure not reflecting actual market conditions. Wang and Xu (2004) also compute a float-weighted market index. We use the Shenzhen GTA Information Technology Co Limited data in order to build a float-weighted market index and float-weighted risk factors. In what follows, we will compare summary statistics for our float-weighted market index with those for the Shanghai Composite Index and the Shenzhen Composite Index. Both indices are also weighted by float.

As for risk factors, we follow Fama and French (1996), Wang and Xu (2004), Pastor and Stambaugh (2003) and consider the market, a size factor, a floating ratio factor and a liquidity factor. Wang and Xu (2004) propose including a floating ratio portfolio as a proxy for risk of bad governance and expropriation of TS holders. For each company, the floating ratio is estimated by the percentage of TS. Wang and Xu (2004) also suggest that book-to-market is unlikely to play an important pricing role because of poor accounting quality prevalent in the Chinese stock market.

The size and floating ratio factors were built following the methodology described by Fama and French (1996). At the beginning of each month, Shanghai (SSE) and Shenzhen (ZSE) stocks are allocated to two groups (small or big) based on whether their market value during the previous month was below or above the median market value for the specific market. Then stocks are sorted into three float ratio groups (low, medium, or high) based on the bottom 30 percent, middle 40 percent and top 30 percent of the floating ratio (FR). Value-weighted portfolio returns are then computed for each portfolio. The size factor is the difference between the returns of small and big portfolios. The floating ratio factor is the difference between average returns of the high-FR portfolios and average returns of two low-

FR.[12] Theoretically, the average return of the floating ratio factor should be negative as it represents a portfolio long on good governance companies and short on bad governance companies. However, Wang and Xu (2004) themselves find that the average return of floating ratio factor is negative, explaining this result on the basis of the better performance displayed by companies with more efficient governance. It is therefore unclear whether FR is a true proxy for a non-diversifiable risk factor. Similarly, we build a liquidity portfolio after ranking stocks on the basis of their liquidity indicators as in Pastor and Stambaugh (2003).

Table 6 reports summary statistics about indices and risk factors for two sub-periods: 1998-2005 and 2005-2007.

[INSERT TABLE 6 HERE]

The correlation between our own index and the Shanghai and Shenzhen indices are always above 93%. There is some difference in the mean and the median returns in the first sub-period but the various summary statistics are almost identical in the most relevant 2005-2007 period. As a result of this, we do not repeat the tests. The risk factors are not very correlated among themselves. The largest correlation is equal to 0.49 between the size and the floating factors. Average returns are negative in 2005-2007. While this is inconsistent with the identification of these portfolios as risk factors, we notice that two years is a short sample and the actual returns may well not be good proxies of expected returns. In the previous sub-sample average returns are positive, except for the liquidity factor, which is essentially zero.

Table 7 reports the event study derived from the abnormal returns factor model.

[INSERT TABLE 7 HERE]

The results are very similar to those of table 2, except that positive cumulative abnormal returns are significant for the four days before the first suspension from trading and the total decrease after the second readmission is about half the estimate we had before. Basic conclusions do not change, as a four-day increase in prices is more likely to be associated with information about the identity of the companies to be suspended than with a risk premium.

Table 8 reports the robustness analysis for our bootstrap methodology. We estimate the market model using data over 140 days, 250 days and 500 days. Table 8 reports the p-values obtained on the basis of the three procedures and shows that the results are very robust to alternative choices of the estimation period to be used.

[12] We have followed Wang and Xu (2004) and have used the part of the floating ratio that is orthogonal to size measured as the log of the market value.

[INSERT TABLE 8 HERE]

Finally, we compute our event studies on the basis of the Dimson (1979) estimator, allowing for non-synchronous trading through leads and lags of the market return. The results are almost unchanged. They are not reported here but are available upon request.

4 Conclusions

We have studied the reaction of stock returns and trading volume to a structural reform of the Chinese stock market. Our main results are: (i) abnormal returns are positive in the two days before the first suspension. The increase in prices before the first suspension could be due either to a premium for the non-diversifiable compensation risk or to speculation. We are inclined to favor the latter explanation as positive abnormal returns emerge only in the two days before the suspension, while a risk premium would have been associated with a more gradual and extended increase. (ii) Abnormal returns are positive in the ten days after the first readmission. This cannot be justified by new information. One possibility is that they are due to a delayed reaction to compensation surprise. Another possibility is that investors are more attracted to stocks neglected before the reform. Enhanced liquidity may also play a role. (iii) Prices drop after the second readmission (-0.73% cumulatively), even though the evidence is not significant from a statistical point of view. (iv) Volume increases to record levels during and after the reform, even accounting for the increase in the supply of shares assigned as compensation. The increase in turnover that is associated with positive abnormal returns after the first readmission but not after the second readmission raises the possibility that investors have a higher demand for securities they were not familiar with before the reform and makes it less likely that the results can be explained by general turnover-induced speculation activity.

Overall, our results do not point to the existence of gross valuation errors on the part of Chinese investors. Speculation may have been at work but does not seem to dominate the picture. We have to acknowledge the complexities of measuring the rational price response in such a big structural change for the market, allowing for changes in liquidity, volume, demand/supply imbalance, visibility. A statistically significant cumulative abnormal return of approximately 170 basis points is certainly economically relevant, but may be explained by a visibility effect together with the expected benefits of enhanced liquidity.

Decile	Batches	#	Days	LPS	NTS	Comp	Size	Div	Bid Ask		Price Range		Turnover	
									BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER
1	3-6	120	9	28%	59%	0.32	6.84	2.01	0.33%	0.31%	3.83%	3.32%	5.34	3.91
2	7-13	130	9	28%	66%	0.29	7.60	1.61	0.39%	0.36%	4.03%	3.47%	4.72	2.36
3	14-19	123	9	24%	64%	0.28	7.54	1.72	0.39%	0.36%	4.01%	3.57%	4.60	2.42
4	20-23	145	11	22%	64%	0.27	7.58	1.63	0.38%	0.35%	3.73%	3.43%	4.69	2.24
5	24-26	121	16	25%	64%	0.28	7.59	1.56	0.38%	0.37%	3.78%	3.48%	4.71	2.16
6	27-30	131	16	23%	62%	0.29	7.32	1.54	0.40%	0.37%	3.82%	3.58%	5.18	2.33
7	31-35	131	13	25%	61%	0.26	7.13	1.10	0.41%	0.38%	3.96%	3.58%	6.05	2.36
8	36-40	125	12	25%	60%	0.26	7.22	0.86	0.42%	0.38%	4.29%	3.72%	6.32	2.54
9	41-53	121	14	29%	63%	0.16	7.22	0.88	0.43%	0.41%	4.17%	3.75%	6.67	2.94
10	54-59	63	16	22%	62%	0.11	6.98	0.53	0.42%	0.38%	4.36%	3.81%	7.83	3.06
All	3-59	1210	12	25%	63%	0.26	7.41	1.202	0.40%	0.37%	4.02%	3.60%	5.53	2.62
Min			4	0%	0%	0.00	4.78	0	0.11%	0.08%	1.70%	0.87%	0.17	0.06
Max			107	85%	98%	1.10	12.67	12.75	1.45%	1.95%	6.40%	6.15%	34.67	17.08
Median			9	17%	64%	0.30	7.25	0.90	0.38%	0.35%	4.02%	3.56%	4.66	1.92
St. dev.			9.587	0.254	0.126	0.125	0.802	1.377	0.001	0.001	0.007	0.006	3.834	2.240

Table 1. Summary statistics. The table contains summary statistics for ten groups of companies going through the reform process. Each group includes about 10% of the companies which participated in the reform. The second column reports the number of batches in each decile. Column three reports the number of companies in each group and column four reports the length of the first suspension period. Columns five to seven report information about the percentage of legal shares, the percentage of TS and average compensation. The remaining columns provide information about economic and financial characteristics computed both before the start of the reform (average value in the year before August 2005) and during the reform period (from August 2005 until the day of the first suspension). The characteristics are: size (in logarithms of market values), the dividend ratio, the bid-ask spread, price range (the difference between maximum and minimum price on a given day), and turnover.

	Day	MCAR	CLM VARIANCE T-Stat	CS VARIANCE T-Stat	BOOTSTRAP P-Value
PRE	-10	-0.03%	-0.37	-0.93	0.52
	-9	0.04%	0.38	0.96	0.45
	-8	0.22%	1.64	4.35	0.35
	-7	0.29%	1.88	5.07	0.35
	-6	0.31%	1.83	4.86	0.37
	-5	0.27%	1.43	3.84	0.42
	-4	0.44%	2.20	5.81	0.38
	-3	0.81%	3.79	9.93	0.30
	-2	1.39%	5.77	16.09	0.10
	-1	2.20%	8.28	24.26	0.01
DURING	0	0.70%	5.57	3.34	0.02
	1	0.52%	3.43	2.11	0.15
	2	0.70%	3.98	2.60	0.11
	3	1.03%	5.28	3.48	0.07
	4	1.25%	6.00	3.98	0.05
	5	1.43%	6.49	4.47	0.03
	6	1.52%	6.68	4.64	0.01
	7	1.66%	7.10	4.98	0.01
	8	1.73%	7.29	5.14	0.00
	9	1.76%	7.29	5.19	0.00
POST	0	0.35%	3.10	0.95	0.11
	1	-0.08%	-0.61	-0.21	0.53
	2	-0.42%	-2.80	-1.06	0.68
	3	-0.57%	-3.41	-1.41	0.71
	4	-0.60%	-3.26	-1.43	0.70
	5	-0.69%	-3.48	-1.65	0.71
	6	-0.70%	-3.30	-1.63	0.69
	7	-0.74%	-3.26	-1.70	0.68
	8	-0.57%	-2.40	-1.30	0.65
	9	-0.73%	-2.90	-1.64	0.65

Table 2. Event Study Conducted on the Residuals from the Market Model. The table reports the mean cumulative abnormal returns for the 1,007 companies included in the sample. The event study is performed on the residuals from a market model. For each company *i* the model is estimated over a period including observations between t_i-120 and t_i -10 where t_i is the day of the first suspension. The estimated parameters are used to compute abnormal returns over the event windows: 10 days before the first suspension, 10 days after the first suspension, and 10 days after the second suspension. Abnormal returns are summed up to form cumulative abnormal returns (CARs). CARs are then averaged across companies to obtain mean cumulative abnormal residuals (MCARs). The null hypothesis of no abnormal returns is tested under the assumption of independence across abnormal residuals of different firms following Campbell, Lo and MacKinlay (1997) (CLM variance) and under the assumption of no correlation across abnormal residuals (CS variance;see Asquith, 1983 and Lynch and Mendenhall,1997). The table presents the t-stats for all the procedures, as well as bootstrap p-values obtained from the methodology described in the text.

VOLUME	PRE		DURING			POST		
		%		%	Æ%		%	Æ%
Shanghai	338	0.10%	600	0.17%	+ 78%	737	0.19%	+ 118%
Shenzhen	320	0.16%	495	0.23%	+ 55%	677	0.32%	+ 111%
Total	331	0.06%	560	0.10%	+ 69%	714	0.12%	+ 116%

Table 3. Volume. The table reports the simple average volume (millions of shares traded on a particular day) for stocks participating in the reform process. The average is reported for the month before the reform process, for the period between the two suspensions and for the month after the reform process. The table reports absolute volume, the proportion with respect to the total market volume (Percentage) and the increment (Percentage change) with respect to the average value computed over the month preceding the first suspension.

	Day	Abnormal Volume MEAN	MEDIAN	ST. DEV.	P-VALUE	% POSITIVE	OBSERVATIONS
PRE	-10	14%	-14%	0.03	0.105	41%	1007
	-9	17%	-8%	0.03	0.075	44%	1007
	-8	30%	0%	0.04	0.054	49%	1007
	-7	37%	3%	0.04	0.037	53%	1007
	-6	35%	3%	0.04	0.023	53%	1007
	-5	25%	-9%	0.04	0.053	42%	1007
	-4	31%	-2%	0.04	0.037	47%	1007
	-3	39%	0%	0.04	0.017	52%	1007
	-2	53%	8%	0.04	0.005	56%	1007
	-1	82%	22%	0.05	0.000	60%	1007
DURING	0	195%	117%	0.10	0.000	87%	681
	1	70%	27%	0.05	0.005	62%	657
	2	49%	7%	0.06	0.009	52%	620
	3	42%	4%	0.05	0.011	52%	571
	4	34%	-1%	0.06	0.011	49%	447
	5	29%	-5%	0.06	0.009	47%	333
	6	14%	-8%	0.06	0.017	43%	238
	7	15%	-15%	0.07	0.011	42%	177
	8	14%	-16%	0.09	0.006	41%	135
	9	21%	-15%	0.10	0.005	42%	109
POST	0	522%	383%	0.17	0.000	98%	1007
	1	307%	206%	0.12	0.000	91%	1007
	2	224%	139%	0.10	0.000	83%	1007
	3	204%	119%	0.10	0.000	82%	1007
	4	201%	109%	0.15	0.000	80%	1007
	5	186%	96%	0.11	0.000	79%	1007
	6	178%	94%	0.10	0.000	77%	1007
	7	169%	90%	0.09	0.000	77%	1007
	8	163%	78%	0.09	0.000	74%	1007
	9	161%	71%	0.09	0.000	74%	1007

Table 4. Percentage Abnormal Volume. The table presents abnormal volume computed following Brav and Heaton (1999) and Brav and Gompers (2003). The sample is composed of 1,007 companies involved in the reform process from April 2005 through February 2007. Abnormal volume is the percentage difference between actual volume and normal volume. Normal volume for company *i* is defined as the mean daily volume between t_i -120 and t_i -11 where t_i is the day of the first suspension. Volume is the number of shares traded for a stock on a particular day. The periods considered are: ten days before the first suspension, ten days after the first suspension and ten days after the second readmission. The table presents the mean, the median, the standard deviation, the bootstrap p-value, the percentage of positive abnormal volume, and the number of observations.

	Day	MCAV	CLM VARIANCE T-Stat	CS VARIANCE T-Stat	BOOTSTRAP P-Value
PRE	-10	1.55%	4.13	10.35	0.02
	-9	3.03%	5.08	14.25	0.01
	-8	5.69%	7.66	21.87	0.00
	-7	7.55%	8.10	25.15	0.00
	-6	10.03%	9.20	29.88	0.00
	-5	11.59%	9.25	31.51	0.00
	-4	13.64%	9.57	34.35	0.00
	-3	16.71%	11.17	39.36	0.00
	-2	20.00%	12.72	44.41	0.00
	-1	24.57%	14.65	51.76	0.00
DURING	0	7.72%	40.46	19.85	0.00
	1	12.21%	26.15	21.87	0.00
	2	15.86%	21.92	22.37	0.00
	3	19.52%	20.71	22.45	0.00
	4	22.25%	16.60	19.95	0.00
	5	24.99%	15.40	17.60	0.00
	6	26.26%	11.70	14.21	0.00
	7	28.88%	10.04	12.36	0.00
	8	33.21%	9.52	11.48	0.00
	9	36.16%	8.28	10.66	0.00
POST	0	11.02%	56.56	28.26	0.00
	1	17.56%	31.05	31.28	0.00
	2	22.93%	27.91	32.77	0.00
	3	28.03%	27.40	34.12	0.00
	4	32.52%	26.55	34.84	0.00
	5	36.68%	25.17	35.29	0.00
	6	41.33%	24.87	36.22	0.00
	7	45.35%	24.07	36.59	0.00
	8	49.17%	23.15	36.81	0.00
	9	53.03%	23.03	37.09	0.00

Table 5. Abnormal Turnover from the Ajinkya and Jain (1989) Model. The table reports the results of the mean cumulative and average abnormal volume analyses for the 1,007 companies included in the sample. The event study is performed on the residuals from the Ajinkya and Jain (1989) model. For each company involved in the stock reform process the model is estimated over a period including observations between t_i-120 and t_i -10, where t_i is the day of the first suspension. Estimated parameters are used to compute the abnormal turnover over the event windows. Abnormal turnover is averaged across companies to form the mean cumulative abnormal turnover (MCAV). The null hypothesis of no abnormal turnover is tested under the assumption of independence across abnormal residuals of different firms following Campbell, Lo and MacKinlay (1997) (CLM variance) and under the assumption of no correlation across abnormal residuals (CS variance; see Asquith, 1983and Lynch and Mendenhall,1997). The table presents the t-stats for all the procedures as well as bootstrap p-values obtained from the methodology described in the text.

Panel A: From January 1998 to January 2005

	CHSCOMP	CHZCOMP	Market	Size	Floating	Liquidity
CHSCOMP		0.97	0.99	0.14	0.03	-0.01
CHZCOMP			0.99	0.21	0.11	-0.03
Market				0.19	0.09	-0.02
Size					0.36	-0.33
Floating						-0.18
Liquidity						
mean	0.00%	-0.01%	0.00%	0.04%	0.00%	-0.01%
median	0.00%	0.00%	0.03%	0.05%	0.00%	0.00%
Minimum	-8.73%	-8.68%	-8.96%	-3.36%	-2.69%	-1.64%
Maximum	9.40%	9.24%	8.95%	2.68%	2.54%	1.69%
Annual St.Dev.	22.24	23.53	23.01	8.96	5.81	4.61
Annual Return	1.01%	-3.37%	1.07%	10.14%	0.09%	-1.42%
Total Performance	5.97%	-21.79%	5.94%	94.13%	-0.38%	-9.87%

Panel B: From January 2005 to February 2007

	CHSCOMP	CHZCOMP	Market	Size	Floating	Liquidity
CHSCOMP		0.93	0.94	-0.02	0.17	0.03
CHZCOMP			0.99	0.15	0.35	-0.01
Market				0.10	0.32	0.01
Size					0.49	-0.32
Floating						-0.05
Liquidity						
mean	0.16%	0.16%	0.15%	-0.01%	-0.02%	-0.02%
median	0.14%	0.25%	0.21%	-0.01%	-0.02%	-0.01%
Minimum	-9.26%	-8.93%	-10.27%	-2.46%	-1.99%	-1.34%
Maximum	7.89%	7.62%	7.48%	3.16%	2.15%	0.81%
Annual St.Dev.	24.16	25.41	25.69	12.58	7.16	4.65
Annual Return	39.67%	40.89%	38.02%	-3.32%	-5.25%	-5.86%
Total Performance	131.83%	137.21%	123.25%	-8.56%	-11.16%	-11.81%

Table 6. Risk Factors. The table contains summary statistics about the risk factors. The factors are: the Shanghai Composite market index, the Shenzhen Composite market index, our float-weighted market index, a size portfolio, a floating ratio portfolio, a liquidity portfolio. Panel A reports correlations and summary statistics (mean, median, minimum, maximum, standard deviation, total performance) over the period 1998-2005. The data refer to daily percentage returns except for the total performance which refers to the return over the whole sub-sample. Panel B reports correlations and summary statistics over the period 2005-2007.

	Day	MCAR	CLM VARIANCE T-Stat	CS VARIANCE T-Stat	BOOTSTRAP P-Value
PRE	-10	0.10%	1.43	3.38	0.20
	-9	0.12%	1.08	3.01	0.25
	-8	0.32%	2.30	6.43	0.19
	-7	0.45%	2.84	7.95	0.16
	-6	0.57%	3.19	8.97	0.14
	-5	0.65%	3.27	9.22	0.12
	-4	0.83%	4.00	10.95	0.09
	-3	1.25%	5.77	15.52	0.05
	-2	1.82%	7.69	21.20	0.00
	-1	2.74%	10.43	30.29	0.00
DURING	0	0.51%	3.29	1.95	0.00
	1	0.36%	1.98	1.17	0.08
	2	0.52%	2.58	1.52	0.07
	3	0.79%	3.61	2.25	0.04
	4	1.05%	4.43	2.87	0.02
	5	1.23%	4.90	3.27	0.01
	6	1.35%	5.17	3.50	0.01
	7	1.48%	5.61	3.85	0.00
	8	1.59%	5.94	4.11	0.00
	9	1.65%	6.07	4.20	0.00
POST	0	0.42%	2.70	1.05	0.02
	1	-0.02%	-0.13	-0.05	0.42
	2	-0.32%	-1.72	-0.76	0.87
	3	-0.43%	-2.15	-1.01	0.90
	4	-0.48%	-2.22	-1.09	0.90
	5	-0.57%	-2.46	-1.28	0.92
	6	-0.50%	-2.03	-1.11	0.83
	7	-0.51%	-1.96	-1.11	0.82
	8	-0.33%	-1.22	-0.71	0.59
	9	-0.47%	-1.64	-1.00	0.69

Table 7. Event Study Conducted on the Residuals from the Wang-Xu Model with Liquidity Replicating Portfolio. The table reports mean cumulative abnormal returns for the 1,007 companies included in the sample. The event study is performed on the residuals from a factor model including the market, size, float and liquidity. For company *i* the model is estimated over a period including observations between t_i -120 and t_i -10 where t_i is the day of the first suspension. The estimated parameters are used to compute the abnormal returns over the event windows. Abnormal returns are summed to form cumulative abnormal returns (CARs). CARs are then averaged across companies to obtain mean cumulative abnormal residuals (MCARs). The null hypothesis of no abnormal returns is tested under the assumption of independence across abnormal residuals of different firms following Campbell, Lo and MacKinlay (1997) (CLM variance) and under the assumption of no correlation across abnormal residuals (CS variance; see Asquith, 1983 and Lynch and Mendenhall, 1997). The table presents the t-stats for all the procedures as well as bootstrap p-values obtained from the methodology described in the text.

	Day	MCAR	140 DAYS P-Value	250 DAYS P-Value	500 DAYS P-Value
PRE	-10	-0.03%	0.52	0.53	0.58
	-9	0.04%	0.45	0.46	0.48
	-8	0.22%	0.35	0.39	0.39
	-7	0.29%	0.35	0.36	0.40
	-6	0.31%	0.37	0.37	0.38
	-5	0.27%	0.42	0.45	0.45
	-4	0.44%	0.38	0.41	0.40
	-3	0.81%	0.30	0.33	0.30
	-2	1.39%	0.10	0.10	0.14
	-1	2.20%	0.01	0.02	0.05
DURING	0	0.70%	0.02	0.02	0.02
	1	0.52%	0.15	0.15	0.15
	2	0.70%	0.11	0.14	0.14
	3	1.03%	0.07	0.08	0.08
	4	1.25%	0.05	0.05	0.06
	5	1.43%	0.03	0.02	0.04
	6	1.52%	0.01	0.01	0.03
	7	1.66%	0.01	0.01	0.02
	8	1.73%	0.00	0.01	0.02
	9	1.76%	0.00	0.01	0.02
POST	0	0.35%	0.11	0.12	0.10
	1	-0.08%	0.53	0.53	0.59
	2	-0.42%	0.68	0.71	0.73
	3	-0.57%	0.71	0.75	0.75
	4	-0.60%	0.70	0.73	0.73
	5	-0.69%	0.71	0.72	0.73
	6	-0.70%	0.69	0.70	0.70
	7	-0.74%	0.68	0.70	0.70
	8	-0.57%	0.65	0.67	0.67
	9	-0.73%	0.65	0.69	0.69

Table 8. Bootstrap robustness. The table reports p-values for our event study obtained by residuals estimated over three alternatives bootstrap estimation periods of 140 days, 250 days and 500 days following the methodology described in the text.

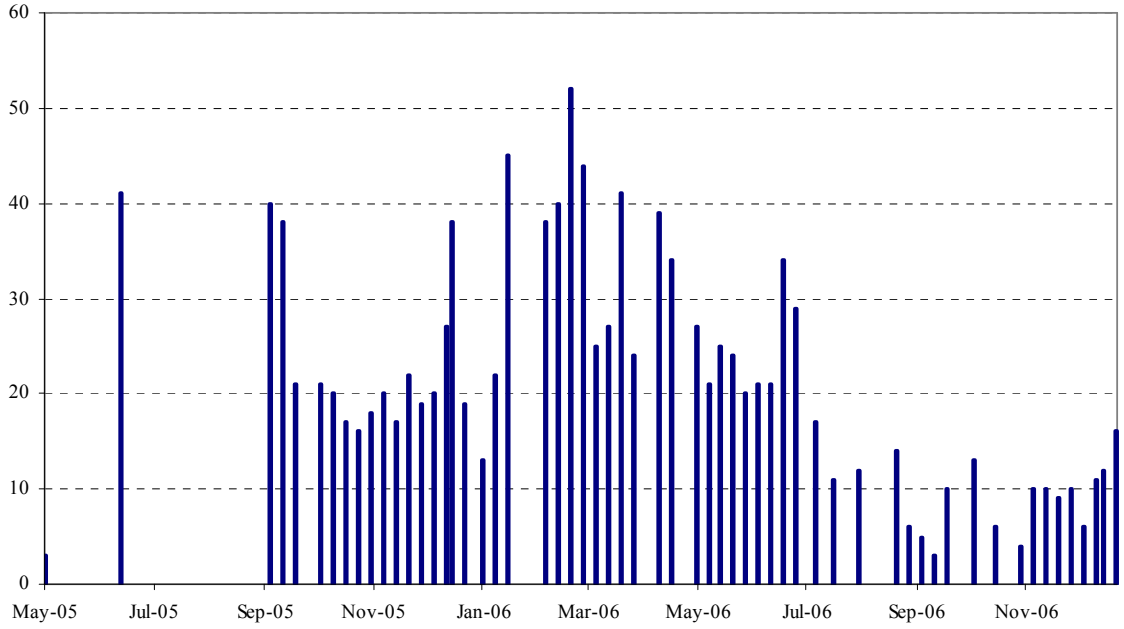

Figure 1. Batches of Companies. The figure reports the timing of various batches and the number of companies belonging to each batch.

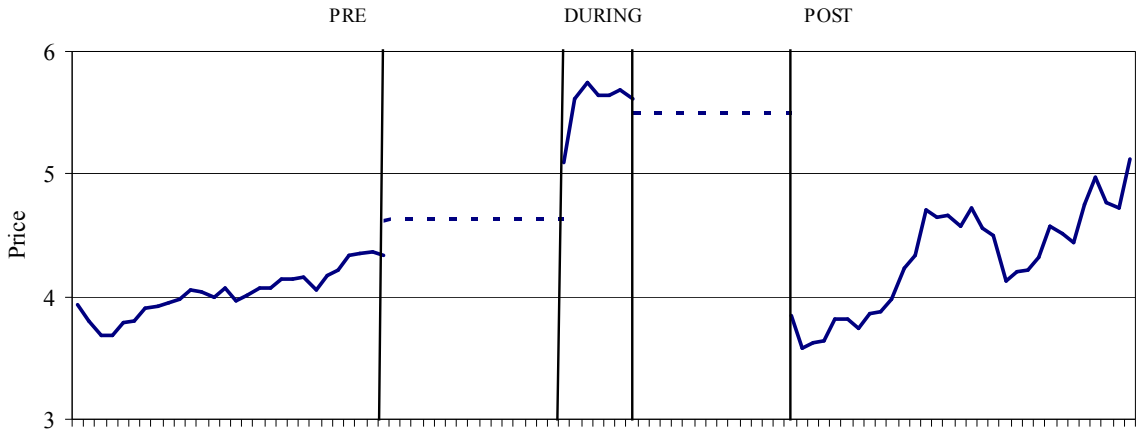

Figure 2. Baotou Huazi International Price. The figure shows the price of Baotou Huazi International during the reform process. PRE describes the period before the first suspension from trading, POST describes the period after the second readmission, DURING is the trading period between the two suspension periods.

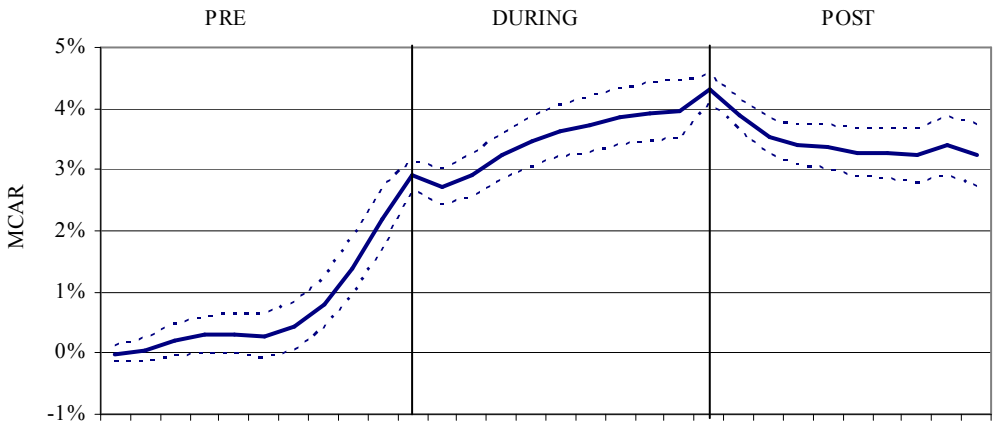

Figure 3. Mean Cumulative Abnormal Returns. The figure reports the results of the MCARs analysis for the 1,007 companies included in our sample and their 95% confidence interval. Residuals are computed from the market model. The cumulative residuals are computed starting ten days before the beginning of the reform process. The first interval (referred to as "PRE" in the picture) covers the ten days before the first suspension. The second interval ("DURING") covers the ten days after the first readmission. The third interval ("POST") covers the ten days after the second readmission.

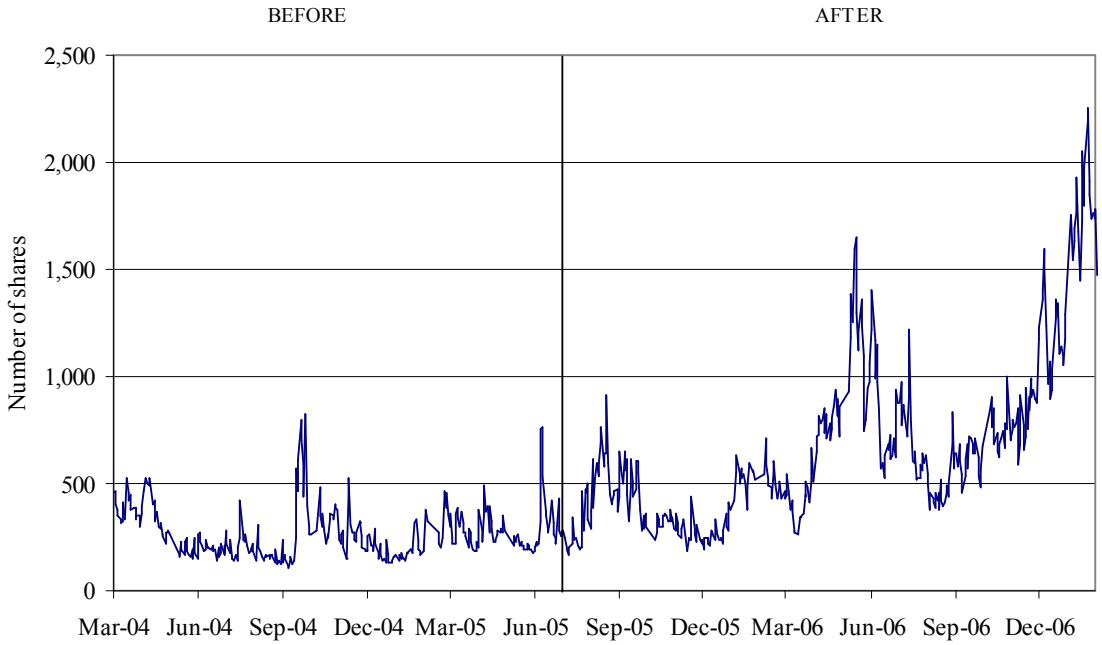

Figure 4. Daily Turnover. The figure reports daily total turnover (millions of shares traded on a given day) of the Shanghai and Shenzhen stock markets between March 2004 and February 2007. "BEFORE" describes the period before the start of the reform process, "AFTER" the period following the start of the reform.

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