Stock Prices in a Speculative Market: The Chinese Split-Share Reform

Abstract

In 2005-2006 China reformed its stock market by eliminating non-tradable shares. The regulator set general guidelines and then assigned responsibility for implementation to each company. We derive relations that should have been followed by the prices of stocks and exploit a company-level data set to compare the actual and the theoretical price reactions. We find evidence for abnormal returns both before the beginning of the reform and during the reform. Cross-sectionally, abnormal returns are associated mainly with turnover and compensation. This shows that in a speculative market, investors do not properly react to unambiguous corporate actions.

JEL classification: G14, N25.

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I. Introduction

In efficient markets, stock prices are the present discounted value of fundamentals. Efficient markets signal the relative scarcity of capital, so investors can react to prices and allocate resources to the most productive and desirable uses. However, speculation may spoil the link between prices and fundamentals. Scheinkman and Xiong (2003) and Hong, Scheinkman and Xiong (2004) 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 to another investor with an even larger willingness to pay in the future. In order to be tested, this model needs an estimate of the speculative component of the price, either at the aggregate level or at the level of the single stock. Mei, Scheinkman and Xiong (2005) use a panel of 73 Chinese stocks with multiple trading classes. By assuming that one class is fairly priced, they find that stocks with larger overvaluation are also characterized by larger turnover.

Speculation is 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. Baker and Wurgler (2006) build a monthly sentiment index and show that the cross-section of subsequent returns may be meaningfully conditioned on such a variable. Their interpretation is that markets can make mistakes in relative pricing which depend on the overall level of speculative activity. This result raises several issues about testing of models with data generated by regimes characterized by different degrees of efficiency.

We study the relation between speculation and pricing, exploiting a new data set about the Chinese stock market, whose investors are widely regarded as being very speculative, see Mei, Scheinkman and Xiong (2006). Analyses of Chinese markets are therefore very relevant to understand asset pricing with speculation. Do speculative investors misinterpret the pricing consequences of even simple company actions? In 2005-2006, Chinese regulators decided to

eliminate the class of non-tradable shares (NTS), that could not be freely traded on the local stock markets. This reform was achieved through a process by which holders of NTS paid compensation to holders of tradable shares (TS)[1] in exchange for the right to sell their shares in the future. After successful initial experiments with a small number of firms, in August 2005 Chinese authorities publicly declared extension of the process to all companies traded in the Shanghai and Shenzhen markets, and set the end of 2006 as a deadline for the completion of the reform. Each company joining the reform had to respect a schedule implying two trading suspensions and subsequent readmissions. We carry out an event study[2] and measure the cumulative abnormal returns of stocks as well as variables like volume and volatility, which, in some models, for example Baker and Stein (2004) and Hong, Scheinkman and Xiong (2006), are linked to irrational traders and speculative activity. We finally carry out cross sectional analyses connecting price changes, volume, volatility and other relevant variables.

Our main findings are as follows. Risk-adjusted stock prices increase both before the first suspension and in the period following the first readmission. Volume increases substantially in all the event periods, with a particularly strong rise after the second readmission. Prices fall after the end of the reform. Cross-sectionally, prices react to the surprise in the compensation assigned to the holders of the TS, to variables that proxy the governance structure and the quality of various companies, as well as to volume and volatility. We show that the price increase before the first suspension is unlikely to be generated by a risk premium and claim that our findings are coherent

[1] Such compensation is consistent with the idea that the transformation of NTS into TS may damage the current holders of TS, 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)

[2] The results of several event studies have been interpreted as producing “anomalies”, especially in the long-term reactions of prices. Fama (1998) disputes the robustness of long-term return event studies, but recognizes the usefulness of short-term return event studies.

with speculation driving portfolio choices of investors. Our results are generally coherent with the hypothesis that in a speculative market, investors may not correctly price simple corporate actions.

Our paper is different from previous studies. Neither we study the relation between bubbles and speculation, as done by Mei, Scheinkman and Xiong (2006), nor we consider the cross section of stock returns from a predictive point of view, as done by 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. This is a useful addition to the literature because we exploit corporate actions whose effects on stock prices should be unambiguous. From a methodological point of view, our contribution is the introduction of a bootstrap procedure that is designed to replicate the actual degree of covariance across firms when doing statistical tests on cumulative average abnormal returns.

We are aware of several other papers studying this reform. Lu, Balatbat and Czernkowski (2008) examine the reaction of prices both to the general announcement of the reform and to the company-specific announcements with particular regard to compensation characteristics for a sample of firms. Li, Wang, Cheung and Jiang (2007) 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 among different shareholders. Liao, Li, Liu and Wang (2008) study what happens to prices on the day of the lockup expiration. Our paper is different: we study all Chinese stocks and consider all the different phases of the reform. Moreover we interpret the data as relevant to the study of asset pricing in a speculative market.

After this introduction, the plan of the paper is as follows. Section II discusses the Chinese stock market, both from the point of view of the papers which are more relevant to our research and from an institutional point of view. The section moreover contains a description of the reform process and of the mechanics by which firms compensate shareholders. Section III discusses the

theoretical background. Section IV describes methodological issues, the structure of the event study and the empirical results. Section V concludes.

II. 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) taking place in the 1990s and to the interest on the part of the State not to totally relinquish control of firms. A-shares could be traded only by domestic investors until 2003. Since that date the possibility of trading domestic renminbi-denominated securities has been extended to Qualified Foreign Institutional Investors (QFII) but only up to a value of 5.65 billion dollars, about 1% of the stock market capitalization. B-shares are denominated in foreign currencies and until February 2001 were reserved to foreign investors[3]. Overseas listed shares are issued by Chinese companies on securities markets outside mainland China (H-shares, for those 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, in the restructuring process of State-owned enterprises (SOEs), 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 nontradeable 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.

Transfer of NTS has become possible since mid 1990s through irregularly scheduled auctions and over-the-counter transactions. According to Green and Black's (2003) analysis of 840

[3] Chinese investors have to 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

transactions taking place in the Shenzhen market in the period 1994-2003, such transfers have often involved large blocks affecting the control of companies. The dominant sellers were State-controlled shareholding companies, and the dominant buyers were private companies. 32% (46%) of the deals were associated with a change in control in 2001 (2002). Chen and Xiong (2001) find a large discount (price of NTS as a ratio of the price of TS) 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, firms with low stock return volatility.

On April 29, 2005 the China Securities Regulatory Commission (CSRC) announced a pilot program to transform NTS into TS. In Its final version, the reform involves two suspension periods for each company. During the first suspension period holders of NTS discuss the compensation proposal to be submitted to the holders of TS. The company then publishes a notice to provide full details of the proposal to shareholders. Once the shares resume trading, no further revisions can be made to the proposal to be submitted for shareholders approval. After this first suspension period, the shares are then suspended for a second time after the closing date of registration for participation in shareholders' meeting. Trading is resumed again after the meeting that ratifies the completion of the reform process and at the same time the compensation is paid. The reform proposal is approved if (a) at least two-thirds of the votes totally cast by holders of NTS and holders of A-shares are in favor (b) at least two-thirds of the vote cast by holders of A-shares who participate in the meeting are in favor.

Compensation to holders of TS can be paid through various channels: (a) new shares can be offered directly by holders of NTS to holders of TS (b) new shares may be offered by the company to holders of both TS and NTS (c) holders of NTS may cancel part of their shares (d) holders of TS may be offered compensation in cash or a certain assignment of warrants. Offers are usually expressed as a percentage of 10 TS originally held. The typical case (79.1% of the cases) involves a direct transfer of currently NTS to holders of TS. On average holders of TS get 3.12 shares every 10 shares originally held. The second most popular method (8.9%) involves new issues that are

assigned only to holders of TS. In this case holders of TS get on average 5.90 shares every 10 shares originally held.

Companies undergo the reform in various batches[4]. The first batch included four companies. On June 17, 2005, the CSRC initiated the second round of the program, involving 42 companies. On August 19, this second round was accomplished. 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 and highlights that they have been rather regular both in terms of timing (2-3 batches every month) and in terms of number of companies (about twenty in each batch)[5] since October 2005. On February 2007, 1.301 listed companies had either completed or initiated their NTS reform process.

[INSERT FIGURE 1 HERE]

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

[5] In order to provide further incentives for companies to join 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 concerning 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 not reserved anymore to the small group of qualified investors but is extended to all the investors willing to buy a minimum stake of 10% of the company and hold the shares for longer than three years.

III. Theoretical price movements without speculation

In order to understand the pricing implications of the reform it is useful to analyze the sequence of events at the level of the single firm. Consider a simple case where, before the beginning of the reform, there are 10 TS with a market price of 1 and 20 NTS with a market price of 0.65. Total market value is equal to 23. Assume that there is an announcement that NTS will become tradable in the future and that no compensation will be paid to holders of TS. Also assume that the demand curve is horizontal, expectations of fundamentals are not changed by the announcement and there is no discounting. It follows that the new price of NTS should be equal to the price of TS due to disappearance of the illiquidity discount. Longstaff (2001) shows how large the price discount may be even in a rational market. The market value of the company immediately increases to 30. Assume now that the announcement also states that compensation will involve a transfer of 3 NTS to holders of TS. To allow for compensation, the price of each TS should be equal to 13/10 and the price of each NTS should be equal to 17/20. Before compensation is paid, wealth of both shareholders increases. After compensation is paid, prices readjust to 1, holders of TS have a total wealth of 13 and holders of NTS have a total wealth of 17. Compensation is equivalent to a split from the point of view of holders of TS: they had 10 TS at a unitary price of 13/10 before compensation payment, and they have 13 shares at a unitary price of 1 after the payment.

Consider now a stylized description of the reform that is representative of the true mechanism: (i) the initial announcement takes place at time 0, (ii) trading is suspended at time 1, (iii) at time 2 the company is readmitted to trading, contemporaneously to an announcement about the size of the compensation, (iv) the company is again suspended from trading at time 3, (v) the compensation is paid and the company is readmitted to trading at time 4. The path of rational prices of TS should be the following: (i) prices react to expected compensation as well as to expected changes in fundamentals at time 0, perhaps allowing for an expected supply effect; (ii) between time 0 and time 1, prices react to revisions in expectations of compensation and other fundamentals. Prices have a positive drift to remunerate the compensation risk premium. (iii) At time 2 prices

react to any compensation surprise. (iv) Nothing happens between time 2 and time 3 as no new information is released and there is no more risk. In principle, there is some risk between the day of the public announcement of the compensation and the day when the shareholders meet to formally approve the reform package. However in practice there was no example 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 time 4. 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). Coherently 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. In the Chinese case however the split is forced by the reform process and it is unlikely that managers have used it to provide specific information.

IV. Empirical analysis

A. Methodological issues

The event study uses the residuals from a pricing model. The pricing model is estimated using observations between t_i-*120* and t_i-*10*[6], where t_i is the day of the first suspension for stock *i.* The estimated parameters are used to compute the cumulative abnormal returns (CAR) in the event windows. In what follows we will consider simple CAPM-adjusted returns. A final section will deal with robustness analysis, allowing for estimation of multi-factor models. For all event windows, cumulative abnormal returns are averaged across companies to obtain the mean cumulative abnormal residuals (MCAR).

[6] We have also experimented with other estimation periods like *t-150/t-10* and *t-90/t-10* but results are not affected.

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

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

where:

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

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. In what follows we define this variance estimate as CLM variance. The null hypothesis of no abnormal returns is tested by means of the statistic:

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

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 sometimes overlapping across firms because the latter are divided in batches of companies going through the reform process over 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 different companies, see Asquith (1983) and 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. Brown and Warner (1985) moreover 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). The bootstrap estimation period includes 140 observations prior to September 16, 2004[6]. 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 any reform.

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 assume that there are only three firms, A, B and C, which are readmitted to trading respectively on January 10, January 15 and March 5 of the year 2006. In the event study we analyze their cumulative average abnormal returns respectively over the periods January 10-January 20, January 15-January 25 and March 5-March 15. 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 stock A 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 such a way there is a five day overlap in the bootstrapped residuals, corresponding to the overlap that takes place among the residuals in the 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, 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. We repeat the procedure 1,000 times and compute an empirical distribution of mean cumulative and average residuals. The comparison between the empirical distribution and the actual value of the tests is used for statistical inference.

We also apply the same bootstrap methodology for our statistical inference regarding volume and volatility. It is important to allow for cross correlations across stocks also for those variables, whose distributions are moreover empirically highly non-normal.

B. Data and summary statistics

We have used three data sets for our empirical work: DataStream, data from Shenzhen GTA Information Technology Co Limited and data kindly provided by Nomura Institute of Capital Market Research. We cannot use the original sample of 1,440 companies for various reasons: (a) 62 companies disappear before the beginning of the reform process, (b) according to DataStream, 17 companies are suspended from trading as of February 2007 for unspecified reasons, (c) 26 companies are born after September 2005, (d) 5 companies did not have NTS before the beginning of the reform process. This leaves us with a sample of 1,330 companies. 1,301 of these have entered the reform process and 1,192 have finished the reform by February, 2007. This sample is again reduced: in 94 cases we have had problems in pricing the compensation paid to shareholders and in other 91 cases the data are not fully convincing because of discrepancies across data sets in the percentage of TS before and after the reform. Excluding these 185 companies leaves us with a sample of 1,007 completing the reform process within February 2007.

To correct for payment of the compensation we assume that total wealth of tradeable 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 holders of TS and *CASH* is the cash compensation. This is not inconsistent with compensation-induced increase in wealth of holders of TS. However such a wealth increase takes place when market prices incorporate the compensation after the formal announcement, several days before the moment of the second readmission. Few companies have paid compensation by assigning warrants. We have computed the theoretical price of the warrants on the basis of the methodology proposed by Galai and Schneller (1978).

C. Qualitative characteristics of companies in the various batches of the reform

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

[INSERT TABLE 1 HERE]

The first group includes 6 batches (first row of the table) and 120 companies (second row), the second group includes 7 batches and 130 companies, and so on. From now on we will refer to these as deciles. Batches usually include a substantial number of companies, except for the first experimental batch, which only included 3 companies, and the last batches of our sample, including several companies that had not completed the reform by February 2007. As figure 1 shows, the reform process has been going on more or less continuously for the period under consideration. Row three reports the length of the first suspension, a crucial period because shareholders have to agree on the compensation. The increasing length may be the signal of a more problematic process of reaching a consensus among different classes of shareholders.

We analyze several characteristics of the different batches and present them in the remaining rows of the table. First, some information about the governance structure (rows 4-6). The percentage of legal shares decreases almost monotonically across batches. Given evidence of positive correlation between legal shares and firm productivity, see e.g. Sun and Tong (2003), this raises the possibility that the government has tried to start the reform with better quality companies. The percentage of TS does not show much relation with the batches. More revealing is the analysis

of compensation characteristics, i.e. the percentage of TS assigned to holders of NTS. The 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 rows 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 the batch number. The pre-reform bid-ask spread, a rough indicator of illiquidity, increases with the batch number. We also compute a second illiquidity indicator, due to Amihud (2002), as the ratio between absolute returns and the remnimbi volume:

(6) $$\frac{1}{N}\sum_{i=1}^{N}\frac{|r_i|}{V_i}.$$

This indicator also increases with the batch number. Interestingly the latter variable shows that illiquidity differentials among companies belonging to early and late batches are very large before the reform but decrease substantially after the reform. 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. Most of all, volatility decreases during the reform. Turnover increases during the reform.

D. 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 CAR 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%, with a concentration in the three days before each announcement. The cumulative returns are statistically significant if evaluated by means of the t-tests but are not significant, except for the last one, if judged on the basis of the bootstrap. This is not consistent with the risk explanation, as one would expect a positive risk premium to hold continuously for all the period before the first readmission. On the contrary, we observe significant abnormal returns only at the very end of the period. This evidence is more consistent with information leakage than a risk story. To evaluate this impression, in figure 4 we also plot cumulative abnormal returns over ninety days before the suspension.

[INSERT FIGURE 4 HERE]

Ths figure confirms that there is no abnormal return except for the few days before the suspension. On the readmission day there is a further 0.7% abnormal return, associated with 67% of the companies showing an increase in the price.

The 0.7% readmission day abnormal return is the result of +1.9% between the closing price before the first suspension and the opening price on the day of the first readmissions, and -1.2% between the opening and the closing of the readmission day. There is therefore some overreaction at the opening price. Moreover, according to the rules of stock exchanges in China, the price movement of a given stock must be within the range +10% and -10%. Many stocks were indeed suspended on the day of their first readmission because the equilibrium price increase was larger than 10%. Our analysis of volume data suggests that, during the reform period, stocks that were

halted did not return to trading on the same day. Suspended companies are not included in the event study concerning the days after the first readmission.

After the initial jump upon readmission, prices tend to increase another 1.7% in the subsequent nine trading days. These abnormal returns are statistically significant. There is therefore no mean reversion, at least after the first readmission, but momentum. If we also consider stocks that were halted at readmission, then the total abnormal return at the end of this period rises to 3.5%. The Merton (1987) effect, according to which investors limit the securities they hold in their portfolios to those "they are aware of", is consistent with the evidence. Media and investors are likely to be particularly interested in stocks going through the reform process, particularly those that have been readmitted to trading after the first suspension. This may create an increase in the base of investors.

On the day of payment of the compensation, the average drop is 16.7%. In subsequent cross-sectional analyses we therefore use compensation-corrected prices, which are on average 0.35% higher than they were when they last traded before the second suspension. Prices then drop 0.73% relatively to the market in the ten following days. The decrease is significant when ignoring clustering but becomes less significant when clustering is allowed 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 the 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. The size of the compensation was probably a better way to provide signals to investors.

E. Volume and volatility

Figure 5 reports the daily total turnover (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 5 HERE]

The increase in total turnover after the beginning of the reform is clearly visible. The average turnover before the reform equals 256 million units, going up to 649 million units after the reform.

Table 3 reports the average turnover for the stocks participating in the reform process, both as an absolute value and as a share of market turnover.

[INSERT TABLE 3 HERE]

The average is reported before, during and after the reform process. For example, the absolute value of the turnover for the stocks joining the reform process one month before suspension (338 million units for the Shanghai market) is the simple average across stocks of the daily turnover in the four weeks preceding the start of the reform process. The number represents 0.10% of the total turnover of the market over the same period. Turnover however increases by 69% in the period after the first readmission (and before the second suspension) with respect to the level before the reform. The increase is 55% for the Shenzhen market and 78% for the two markets together. Volume increases by 116% in the month after the second suspension (with respect to volume before the first suspension) for each single market.

These numbers clearly indicate an increase in trading after the reform. To study this issue in detail we analyze abnormal volume, using two alternative 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-120 through day t_i -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 99^{th} 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 13.7% larger than normal volume, an increase reaching 81.5% the day before suspension. On the day of the first readmission, volume is 154.5% higher than normal, an increase reducing to 49.2% after 10 days. On the day of the second readmission volume is 522% higher than normal, an increase reducing to 160% after 10 days[7], there is therefore a clear increase in volume both during and after the end of the reform.

We also compute abnormal volume following Ajinkya and Jain (1989) and Lynch and Mendenhall (1997). Here volume is defined as:

(7) $$\upsilon_{it} = \log[1 + V_{it}] / \log[1 + MV_{it}],$$

where V_{it} is 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 volume is retrieved from the residuals of a regression of company volume on market volume:

(8) $$\upsilon_{it} = \beta_0 + \beta_1 \upsilon_{mt} + \varepsilon_{it}.$$

The regression is estimated by means of generalized least squares[8]. The coefficients of the volume regressions are estimated using observations between times t_i*-120* and t_i*-10*, where t_i is the day of the first suspension. The cumulative residual analysis described in table 5 shows that companies entering the reform process have a positive abnormal volume in the period preceding the first suspension.

[INSERT TABLE 5 HERE]

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

[8] 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.

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

We estimate volatility by using the price range, defined as the percentage spread between the highest and the lowest values of the stock price on any given day. The price range is a very efficient volatility estimator as emphasized by Alizadeh, Brandt and Diebold (2002). Moreover it has the advantage of providing a point estimate of volatility, contrary to what happens with the historical standard deviation, whose estimation requires a time series of observations. Table 6 shows that the increase in volatility is not statistically significant, except for the readmission day. However the readmission day is heavily affected by the price drop caused by compensation payment, so that this isolated spike in volatility is due to the natural unfolding of the reform.

[INSERT TABLE 6 HERE]

F. The cross section of abnormal returns

We perform a cross sectional analysis aimed at explaining the abnormal returns on the basis of several variables: speculation variables (size-corrected turnover, volatility, lagged returns), structural variables (earnings-to-price, size, bid-ask spread), governance variables (the percentage of legal shares, a dummy for B shares, percentage of TS, two concentration variables to be defined later), reform-specific variables (a dummy equal to 1 for companies paying part of all of the compensation in cash, compensation).

Turnover and volatility are included because HSX (2006) show that overvaluation caused by speculative behavior should be associated with large volume and volatility. In that model, volume is a reflection of differences of opinion across traders, induced by disagreement about the true value of the firm. Merton (1987) argues that more noticeable stocks experience price increases due to more investors attention and Baker and Stein (2004) relate volume to the presence of irrational investors. Also, the empirical literature documents the existence of several interlinkages between volume and returns, see e.g. Lee and Swaminathan (2000) and Griffin, Nardari and Stulz (2007). In particular,

Griffin, Nardari and Stulz (2007) show that past returns may cause future volume. Controlling for lagged returns is therefore important in the regressions. Volatility is a proxy for objective uncertainty about value.

Other variables capture corporate governance. We consider the percentage of legal shares as a proxy for the strength of the local government. Sun and Tong (2003) notice that local government can play a positive role for a firm in PRC because of their limiting state predation, as opposed to central State ownership that does not provide incentives for managers. Their empirical analysis of privatization in PRC confirms that state ownership has negative impact on firm performance while legal-person ownership has a positive effect. Xu and Wang (1999) find a positive and significant correlation between profitability and the fraction of legal person shares and a negative correlation between labor productivity and the proportion of state shares.

As illustrated by Li et al. (2007) and Haveman and Wang (2008) the reform process can be interpreted as a struggle between the different classes of shareholders. In the regressions, we control for the Herfindal index measuring concentration among all shareholders (this index is the sum of the squares of the percentages held by the various shareholders) and for the percentage of TS held by the largest ten shareholders. The latter variable may have ambiguous effects on stock returns. Haveman and Wang (2008) note that large concentration of holders of TS usually implies large holdings on the part of mutual funds and they conjecture that "non-tradable shareholders could have made side-payments to mutual-fund managers to persuade them to accept, on behalf of private investors, less compensation than they would otherwise have demanded". Both Haveman and Wang (2008) and Firth, Lin and Zou (2009) find evidence consistent with this conjecture.

We finally consider a dummy equal to 1 when the company has issued B shares held by foreign investor, which may be a proxy for good corporate governance, the compensation paid to holders of TS and a dummy equal to 1 when part of the compensation is paid in cash.

All the regressions are run with dummy variables controlling for the batch the company belongs to. While some of these dummy variables are statistically significant, there is no clear

picture emerging from the data. We therefore do not report the findings relative to these dummy variables, which are however available to interested readers. Table 7 shows the results.

[INSERT TABLE 7 HERE]

We run the cross section six times, to explain the change in prices over different relevant periods: (i) between the end of August 2005 and the initial day of suspension for each company (ii) ten days before the first suspension (iii) on the day of the first readmission, (iv) between the first readmission and the second suspension, (v) on the day of the second readmission and (vi) ten days after the second readmission. The returns on the two readmission days are measured in terms of percentage difference between the opening price of the readmission day and the last closing price before the suspension period. In theory one would expect all the effects to be absorbed by the opening price due to the information having been released well in advance of the readmission. However price discovery might take several hours so that it is important to evaluate robustness of the results to an alternative definition of returns. We therefore try an alternative specification where the initial return is measured in terms of the percentage difference between the closing price of the readmission day and the last closing price before the suspension period. The results of this second specification are very similar and are not reported for reasons of space.

In the ten days before the first suspension, the only relevant variables are size and volatility, both with a positive coefficient. Larger companies and more volatile companies earned higher returns before the first suspension. It is hard to explain the positive impact of size, as one would expect compensation risk to be concentrated in smaller companies. Volatility may be interpreted as a proxy for speculation, although it is also possible that investors require compensation for idiosyncratic risk. Overall it is hard to explain the cross-sectional heterogeneity in returns in the short period leading to the first suspension. Similar results are obtained on the basis of the analysis that applies to the average return between the official announcement of the extension of the reform to the stock market as a whole (the end of August, 2005) and the day of the first suspension. Importantly, size has now a negative impact, coherently with the risk-based story. The dummy for B

shares has a negative and significant sign, also coherently with the risk-based story according to which companies with higher levels of fundamental risk obtain a larger return after the extension of the reform to the market as a whole. Over the longer period under consideration, companies which can be regarded as less risky from the point of view of relevant characteristics (large companies, companies also held by foreign investors, less volatile companies) offer a lower abnormal return.

The day of the first readmission should be dominated by the compensation variables. Indeed the relevant variables are the dummy variable for payment of cash, the compensation variable, turnover, past returns (returns between the end of August 2005 and the beginning of the company-specific reform). They all have the expected sign. The larger the compensation the larger the price increase, while the offer to compensate through cash was not well appreciated by investors. This latter result is in line with previous research of Cheng, Fung and Leung (2006) finding that stock dividends generate positive stock price reactions while higher non-tradable share ownership implies more cash dividends aimed at providing non-tradable shareholders with immediate financial gains. The turnover variable is also relevant with a positive sign, coherent with the idea that the larger the speculation the larger the price increase. Past return is negative and significant, signaling some mean reversion for companies with a greater price increase before the beginning of the reform at the company level.

Interestingly, there is evidence of delayed effects of the same variables in the ten days after the first readmission, when prices seem to be determined by similar considerations. Notice that this cross-section has only included the companies that were not halted during the first readmission and the second suspension.

The price change on the day of the second readmission depends again positively on turnover. The concentration among holders of TS is positive and significant. As pointed out by the literature, this variable may be considered as a proxy for the presence of mutual funds in the equity capital of a company. The result therefore suggests that the larger the role of mutual funds relatively to other holders of TS, the larger the compensation-corrected price. It is hard to explain this on the

basis of demand pressure, i.e. the attempt on the part of mutual funds to increase their relative power by holding more shares, because the split did not dilute their ownership, that actually increased relatively to holders of NTS. Volatility and past returns (in the period between the first readmission and the second suspension) are also significant.

Finally, in the period following the second readmission, turnover and volatility are significant, as well as concentration among shareholders (positive), dummy for B shares and earnings to price (negative). While the positive impact of turnover and volatility may be associated with speculation, it is hard to understand why the other characteristics should affect returns after the end of the reform.

G. 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 have used the Shanghai and Shenzhen market indices, depending on the trading location of each stock. We also compute a unique float-weighted market index to evaluate the sensitivity of our results to the definition of the market. This is also important 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 to 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 holders of TS. 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 in the Chinese stock market.

The size and floating ratio factors have been 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, S or B) based on whether their market value (MV) during the previous month is below or above the median MV for the specific market. Then the stocks are sorted in three float ratio groups (low, medium, or high: L, M, H) based on the bottom 30 percent, middle 40 percent and top 30 percent of the floating ratio. Value-weighted portfolio returns are then computed for each portfolio. FR is the difference between the average returns of the two high-FR portfolios and the average returns of the two low-FR[9]. Theoretically, the average return of FR should be negative as it represents a portfolio long good governance companies and short bad governance companies. However, Wang and Xu (2004) themselves find that the average return of FR is negative, explaining this result on the basis of the better performance offered by companies with more efficient governance. It is therefore unclear whether FR is a true proxy for a non-diversificable risk factor.

Similarly, we build a liquidity portfolio (HLIQMLLIQ) after ranking stocks on the basis of the liquidity indicator of Pastor and Stambaugh (2003). The liquidity measure for stock *i* in month *t* is the estimate $\gamma_{i,t}$ from the regression:

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

(9) $$r^{e}_{i,d+1,t} = \theta_{i,t} + \phi_{i,t} r_{i,d,t} + \gamma_{i,t} sign(r^{e}_{i,d,t}) \times v_{i,d,t} + \varepsilon_{i,d,t+1},$$

where the dependent variable is the excess return on the stock on day *d* in month *t* and the regressors are respectively the return on the stock in the previous day of the month and a variable obtained from the multiplication of the sign of the excess return and the volume of the stock. The indicator proxies liquidity by an estimate of the return reversal[10]. The portfolio is long high liquidity stocks and short low liquidity stocks.

Table 8 reports summary statistics about the indices and the risk factors for two sub-periods: 1998-2005 and 2005-2007.

[INSERT TABLE 8 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 0.491 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 return may well not be a good proxy of the expected return. In the previous sub-sample average returns are positive, except for the liquidity factor, that is essentially zero. The pre-after factor is strongly positive.

Table 9 reports the event study derived from the factor model abnormal returns.

[INSERT TABLE 9 HERE]

The results are very similar to those of table 2, except that the 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 as large as the estimate we had before. Basic conclusions do

[10] In our estimation, most of the estimated coefficients are negative, coherently with the intuitive meaning of the measure which associates liquidity with stock reversals.

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 10 reports the results of the cross sectional analysis.

[INSERT TABLE 10 HERE]

Accounting for systematic risk factors therefore reduces the cross-sectional impacts of several variables. The main differences are the following: the B-share dummy and size are not significant before the first suspension. The only relevant variable is volatility. This further weakens the risk-based story. The other main difference is that the concentration variable and the earnings to price lose statistical significance after the second readmission. Volatility and turnover are the only variables to be significant in most event periods. Compensation is very significant on the day of the first readmission.

Table 11 reports a robustness analysis for our bootstrap methodology. We alternatively estimate the market model using data over 140 days, 250 days and 500 days. Table 11 reports the p-values obtained on the basis of the three procedures and shows that the results are very robust to alternative choices of estimation period.

[INSERT TABLE 11 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.

V. Conclusions

We have used evidence from a speculative market in order to analyze differences between actual and theoretical prices in the context of a structural reform of the Chinese stock market. The reform consisted of the elimination of a class of non-tradable shares, accounting for about two thirds of the market, and was based on a decentralized bargaining process, involving two suspensions and two readmissions to trading for each company. We compute abnormal returns around event dates and

consider cross-sectional regressions involving variables related to speculation and fundamentals. We also study abnormal volume and volatility.

Our main results are the following: (i) abnormal returns are positive both before the first suspension and after the first readmission. The increase in prices before the first suspension may have been due to a premium for the non-diversifiable compensation risk or to speculation. We are inclined to favor the latter explanation, because the positive cumulative abnormal returns arise only in the few days before the suspension and because of strong cross-sectional comovement between volume and abnormal returns. Positive abnormal returns cannot be justified by new information arising after the first readmission. One possibility is that they are due to a delayed reaction to the compensation surprise. This explanation would not exclude large unexploited profit opportunities. (ii) Prices drop after the second readmission, even though the evidence is not very strong from a statistical point of view. The new information seems therefore to have been incorporated completely during the reform, even though cross-sectionally there is still a strong link between turnover and returns. (iii) 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 raises the possibility that investors particularly increase the demand for securities they were not familiar with before the reform. (iv) Most of the cross-section of average returns is explained by variables linked with speculation, especially volume, even though there is some role for variables associated with fundamentals in the period between the general beginning of the reform and the first day of company-specific suspension. However this latter evidence is not robust with respect to the factors included in the equation for the abnormal returns.

Overall, consistently with previous analyses of the Chinese stock market, speculation seems to dominate relative pricing. Moreover, speculation is, cross-sectionally, strongly associated with abnormal returns, also during periods that have no new information about the value of companies going through the reform process. Investors pushed up prices of companies that were actively traded. Furthermore, prices reacted strongly to compensation and this may be associated with

inefficient models for forecasting company choices. Finally, there was delayed price reaction after the first readmission. It is puzzling that so many inefficiencies have been found in the context of a widely followed structural reform. Substantial amount of money seems to have been left on the table during the reform of the Chinese stock market.

Institutional investors in the Chinese stock market are small but not irrelevant. Finance theory says that prices are determined by marginal investors. Among the best known limitations to arbitrage is short selling, which is indeed prohibited in China. However the inefficiencies we document cannot be explained by the impossibility to short stocks. Buying stocks of companies going through the reform after their first readmission would have been a very simple (and profitable) strategy, as would have been buying stocks of companies that had still to begin the reform process. It would be interesting in future research to look at data on the main portfolio holdings of Chinese mutual funds to understand whether such simple strategies were not widely followed by institutional investors or whether the amount of speculative money was so large to overwhelm the impact of rational investors.

	1	2	3	4	5	6	7	8	9	10
Batches	1-6	7-13	14-19	20-23	24-26	27-30	31-35	36-40	41-53	54-59
Number of Companies	120	130	123	145	121	131	131	125	121	63
Lenght of first suspension	9	9	9	11	16	16	13	12	14	16
Legal Shares %	24%	16%	12%	12%	10%	12%	8%	8%	8%	5%
Tradable Shares %	35%	35%	36%	37%	37%	38%	40%	41%	38%	39%
Compensation %	32%	29%	28%	27%	28%	29%	26%	26%	16%	11%
LnSize	6.22	6.34	6.33	6.43	6.36	6.13	6.01	6.06	5.96	5.87
Dividend	2.01	1.61	1.72	1.63	1.56	1.54	1.10	0.86	0.88	0.53
Bid/Ask (before)	0.34%	0.38%	0.38%	0.38%	0.40%	0.40%	0.41%	0.43%	0.45%	0.44%
Bid/Ask (during)	0.28%	0.34%	0.36%	0.36%	0.36%	0.38%	0.39%	0.40%	0.40%	0.40%
Illiquidity (before)	0.040	0.066	0.064	0.061	0.064	0.077	0.100	0.091	0.124	0.117
Illiquidity (during)	0.017	0.033	0.037	0.034	0.038	0.038	0.044	0.041	0.049	0.049
Price Range (before)	4.10%	3.89%	4.04%	3.88%	3.92%	4.07%	4.11%	4.21%	4.18%	4.44%
Price Range (during)	3.69%	3.82%	3.69%	3.48%	3.55%	3.56%	3.84%	4.29%	4.18%	4.45%
Turnover (before)	1.479	0.561	0.593	0.586	0.571	0.595	0.611	0.580	0.616	0.655
Turnover (during)	1.573	0.785	0.699	0.747	0.789	0.841	0.933	1.037	0.978	1.067

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 joined the reform. The first row reports the number of the batches and second row reports the number of the companies in each deciles. Row three reports the length of the first suspension period. Rows four to six report information about the governance structure: the percentage of legal shares, the percentage of TS, average compensation. The remaining rows provide information about economic and financial characteristics computed 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). Characteristics are: size (in logarithms of market value), the dividend ratio, the bid-ask spread, the Amihud (2002) illiquidity indicator, the price range (the difference between the maximum and minimum price on a given day), and the turnover.

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

Table 2. Event Study Conducted on the Residuals from the Market Model. The table reports results of 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 observation 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: 10 days before the first suspension, 10 days after the first suspension and 10 days after the second suspension. Abnormal returns are summed to form cumulative abnormal returns (CAR). CARs are then averaged across companies to obtain the mean cumulative abnormal residuals (MCAR). 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-stat for all the procedures as well as bootstrap p-values obtained from the methodology described in the text.

	Before first suspension		After first readmission			After second readmission		
	Turnover	Percentage	Turnover	Percentage	Percentage change	Turnover	Percentage	Percentage change
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. Turnover. The table reports the simple average turnover (millions of shares traded for a stock on a particular day) for the 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 the absolute value of turnover, its share with respect to the total turnover of the market (Percentage) and its increment (Percentage change) with respect to the average value computed over the month before the first suspension.

ABNORMAL VOLUME %	Day	Mean	Median	St. Dev.	P-value	Percentage Positive	Number of obs
BEFORE FIRST SUSPENSION	-10	13.7%	-13.6%	0.03	0.105	41%	1007
	-9	17.2%	-7.8%	0.03	0.075	44%	1007
	-8	30.0%	0.0%	0.04	0.054	49%	1007
	-7	36.7%	2.8%	0.04	0.037	53%	1007
	-6	34.8%	2.7%	0.04	0.023	53%	1007
	-5	24.8%	-9.2%	0.04	0.053	42%	1007
	-4	30.8%	-2.3%	0.04	0.037	47%	1007
	-3	39.3%	0.4%	0.04	0.017	52%	1007
	-2	53.3%	7.9%	0.04	0.005	56%	1007
	-1	81.5%	21.9%	0.05	0.000	60%	1007
AFTER FIRST READMISSION	0	195.2%	116.5%	0.10	0.000	87%	681
	1	69.7%	27.1%	0.05	0.005	62%	657
	2	48.5%	6.9%	0.06	0.009	52%	620
	3	42.3%	3.9%	0.05	0.011	52%	571
	4	33.6%	-0.8%	0.06	0.011	49%	447
	5	29.5%	-4.9%	0.06	0.009	47%	333
	6	14.2%	-8.2%	0.06	0.017	43%	238
	7	14.9%	-15.5%	0.07	0.011	42%	177
	8	14.0%	-15.8%	0.09	0.006	41%	135
	9	21.0%	-14.6%	0.10	0.005	42%	109
AFTER SECOND READMISSION	0	522.2%	383.2%	0.17	0.000	98%	1007
	1	306.6%	205.8%	0.12	0.000	91%	1007
	2	224.1%	139.2%	0.10	0.000	83%	1007
	3	203.7%	119.4%	0.10	0.000	82%	1007
	4	201.1%	108.9%	0.15	0.000	80%	1007
	5	186.2%	96.3%	0.11	0.000	79%	1007
	6	177.5%	94.2%	0.10	0.000	77%	1007
	7	168.8%	90.2%	0.09	0.000	77%	1007
	8	163.0%	78.4%	0.09	0.000	74%	1007
	9	160.5%	71.2%	0.09	0.000	74%	1007

Table 4. Percentage Abnormal Turnover. The table presents the abnormal turnover computed following Brav and Heaton (1999) and Brav and Gompers (2003). The sample is composed of 1,007 companies involved in the reform process form April 2005 through February 2007. Abnormal turnover is the percentage difference between actual turnover and normal turnover. Normal turnover for company *i* is defined as the mean daily turnover between t_i -120 and t_i -11 where t_i is the day of the first suspension. Turnover 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 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 turnover, and the number of observations.

Before First Suspension					Aftern First Suspension					After Second Suspension				
Day	MCAV	CLM variance t-stat	CS variance t-stat	P-value	Day	MCAV	CLM variance t-stat	CS variance t-stat	P-value	Day	MCAV	CLM variance t-stat	CS variance t-stat	P-value
-10	0.02	4.13	10.35	0.02	0	0.08	40.46	19.85	0.00	0	0.11	56.56	28.26	0.00
-9	0.03	5.08	14.25	0.01	1	0.12	26.15	21.87	0.00	1	0.18	31.05	31.28	0.00
-8	0.06	7.66	21.87	0.00	2	0.16	21.92	22.37	0.00	2	0.23	27.91	32.77	0.00
-7	0.08	8.10	25.15	0.00	3	0.20	20.71	22.45	0.00	3	0.28	27.40	34.12	0.00
-6	0.10	9.20	29.88	0.00	4	0.22	16.60	19.95	0.00	4	0.33	26.55	34.84	0.00
-5	0.12	9.25	31.51	0.00	5	0.25	15.40	17.60	0.00	5	0.37	25.17	35.29	0.00
-4	0.14	9.57	34.35	0.00	6	0.26	11.70	14.21	0.00	6	0.41	24.87	36.22	0.00
-3	0.17	11.17	39.36	0.00	7	0.29	10.04	12.36	0.00	7	0.45	24.07	36.59	0.00
-2	0.20	12.72	44.41	0.00	8	0.33	9.52	11.48	0.00	8	0.49	23.15	36.81	0.00
-1	0.25	14.65	51.76	0.00	9	0.36	8.28	10.66	0.00	9	0.53	23.03	37.09	0.00

Table 5. Abnormal Volume from the Ajinkya and Jian (1989) Model. The table reports 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 Jian (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. The estimated parameters are used to compute the abnormal volumes over the event windows: 10 days before the first suspension, 10 days after the first suspension and 10 days after the second suspension. The estimated parameters are then used to compute the abnormal volume over the event windows. Abnormal volumes are summed to form cumulative abnormal volume and then averaged across companies to obtain the mean cumulative abnormal volume residuals (MCAV). The null hypothesis of no abnormal volume 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-stat for all the procedures as well as bootstrap p-values obtained from the methodology described in the text.

ABNORMAL PRICE RANGE %	Day	Mean	Median	St. Dev.	P-value	Percentage Positive	Number of obs
BEFORE FIRST SUSPENSION	-10	4.6%	-4.4%	0.02	0.281	45%	1007
	-9	4.6%	-7.0%	0.02	0.297	43%	1007
	-8	11.7%	-9.4%	0.02	0.269	42%	1007
	-7	13.8%	-0.5%	0.02	0.247	48%	1007
	-6	8.4%	-5.5%	0.02	0.240	43%	1007
	-5	6.4%	-7.5%	0.02	0.255	43%	1007
	-4	12.3%	-2.3%	0.02	0.232	47%	1007
	-3	13.4%	-3.6%	0.02	0.248	46%	1007
	-2	15.3%	0.0%	0.02	0.231	49%	1007
	-1	23.4%	4.1%	0.02	0.218	54%	1007
AFTER FIRST READMISSION	0	74.2%	55.9%	0.03	0.142	88%	681
	1	14.6%	4.3%	0.02	0.232	53%	657
	2	5.3%	-9.0%	0.02	0.237	42%	620
	3	1.5%	-11.4%	0.02	0.228	39%	571
	4	-5.5%	-17.5%	0.02	0.525	35%	447
	5	-5.5%	-16.3%	0.02	0.633	38%	333
	6	-6.2%	-13.5%	0.03	0.722	35%	238
	7	-10.1%	-19.8%	0.03	0.798	31%	177
	8	-6.6%	-17.7%	0.04	0.822	32%	135
	9	-12.3%	-20.6%	0.03	0.864	30%	109
AFTER SECOND READMISSION	0	172.7%	131.8%	0.05	0.053	96%	1007
	1	59.1%	38.2%	0.03	0.162	72%	1007
	2	40.3%	17.7%	0.03	0.195	61%	1007
	3	30.6%	12.8%	0.02	0.208	59%	1007
	4	30.3%	11.2%	0.03	0.215	59%	1007
	5	27.0%	7.6%	0.02	0.224	56%	1007
	6	25.8%	6.4%	0.02	0.205	57%	1007
	7	24.4%	3.5%	0.02	0.211	54%	1007
	8	20.1%	2.7%	0.02	0.232	53%	1007
	9	24.6%	6.1%	0.02	0.228	55%	1007

Table 6. Percentage Abnormal Price Range. The table presents the abnormal price range. The sample is composed of 1,007 companies involved in the reform process between April 2005 and February 2007. The abnormal price range is the percentage difference between the actual and the normal price range. The price range is defined as the percentage difference between the highest and the lowest price for a particular day. The normal price range is the mean daily price range between day t_i -120 and day t_i -11, where t_i is the day of the first suspension. The periods considered are: ten days before the first suspension, ten days after 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 price range and the number of observations.

Change in prices	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Legal Person Shares	-0.001	-0.001	-0.011	-0.008	-0.002	0.001
	(0.001)	(0.009)	(0.010)	(0.013)	(0.010)	(0.015)
Concentration (ALL)	-0.016	0.043	-0.034	-0.041	-0.018	-0.028
	(0.012)	(0.030)	(0.037)	(0.046)	(0.038)	(0.066)
Concentration (TSH)	0.002	-0.019	0.031	0.044	0.137**	0.163*
	(0.006)	(0.038)	(0.040)	(0.059)	(0.066)	(0.088)
Dummy B shares	-0.436*	0.843	-1.768	(1.268)	-1.097	-4.547**
	(0.251)	(1.109)	(1.138)	(1.715)	(1.466)	(2.172)
Earning to price	-0.027	0.297	0.17	-0.69	-0.472	-2.179**
	(0.047)	(0.537)	(0.568)	(0.862)	(0.770)	(1.058)
Bid/Ask Spread	0.069	0.827	-0.343	2.51	0.105	2.555
	(0.141)	(1.853)	(1.586)	(2.566)	(2.233)	(2.891)
LnPastMarketValue	-0.072*	1.271***	0.363	0.744	-0.072	0.404
	(0.038)	(0.340)	(0.409)	(0.535)	(0.464)	(0.596)
% Tradable shares	-1.659	0.304	-3.429	-5.041	-6.129	2.622
	(1.077)	(3.242)	(3.303)	(4.681)	(4.245)	(7.139)
Price Range	0.139***	2.009***	(0.023)	(0.087)	0.157**	1.485***
	(0.046)	(0.309)	(0.093)	(0.326)	(0.075)	(0.329)
Turnover	0.111*	0.510	0.453***	1.821***	0.610***	1.785***
	(0.058)	(0.375)	(0.114)	(0.398)	(0.096)	(0.304)
Past Return			-0.753**	-0.691	0.068**	0.064
			(0.354)	(0.443)	(0.035)	(0.043)
Compensation			24.202***	24.296**	-4.131	3.392
			(8.043)	(9.671)	(4.837)	(6.950)
Dummy cash			-7.575***	-6.547**	-1.826	-2.000
			(2.808)	(2.944)	(1.292)	(1.762)
Constant	2.391*	-17.409***	-3.505	-0.355	0.157	-16.550**
	(1.241)	(3.713)	(4.448)	(6.060)	(5.130)	(8.184)
Observations	997	997	672	672	997	997
R-sq	0.23	0.34	0.28	0.34	0.33	0.30

Table 7. Cross Sectional Analysis conducted on the Residuals from the Market Model. The table presents the results of cross sectional analyses where the independent variables are: speculation variables (turnover, price range as a proxy of current volatility, lagged returns), structural variables (earnings-to-price, size), governance variables (the percentage of legal shares, a dummy for B shares, and various concentration variables), reform-specific variables (a dummy equal to 1 for companies giving cash compensation, compensation). The cross section is run six times, to explain the change in prices (i) days between august 2005 and ten days before the first suspension, (ii) ten days before the first suspension (iii) on the day of the first readmission, (iv) between the first readmission and the second suspension, (v) on the day of the second readmission and (vi) ten days after the second readmission. Abnormal returns are obtained from the market model. Robust Standard Errors are reported in parentheses. Significance levels are denoted by (*) for 10 percent, (**) for 5 percent and (***) for 1 percent.

Panel A: From January 1998 to January 2005

	CHSCOMP	CHZCOMP	Market	Size	Floating	Liquidity
CHSCOMP		0.975	0.987	0.142	0.030	-0.010
CHZCOMP			0.990	0.208	0.109	-0.032
Market				0.186	0.086	-0.025
Size					0.363	-0.332
Floating						-0.177
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		0.927	0.941	-0.022	0.168	0.028
CHZCOMP			0.987	0.150	0.353	-0.009
Market				0.101	0.318	0.010
Size					0.491	-0.318
Floating						-0.053
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 8. 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, and a Pre-Post 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.

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

Table 9. 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 observation 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: 10 days before the first suspension, 10 days after the first suspension and 10 days after the second suspension. Abnormal returns are summed to form cumulative abnormal returns (CAR). CARs are then averaged across companies to obtain the mean cumulative abnormal residuals (MCAR). 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-stat for all the procedures as well as bootstrap p-values obtained from the methodology described in the text.

Change in prices	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Legal Person Shares	-0.001	0.001	-0.009	-0.007	-0.004	0
	(0.001)	(0.009)	(0.012)	(0.016)	(0.011)	(0.015)
Concentration (ALL)	0.001	0.022	0.009	0.001	0.002	-0.013
	(0.003)	(0.028)	(0.042)	(0.058)	(0.045)	(0.063)
Concentration (TSH)	-0.002	-0.015	0.038	0.03	0.027	0.022
	(0.003)	(0.039)	(0.045)	(0.065)	(0.072)	(0.099)
Dummy B shares	(0.095)	0.841	-0.862	0.459	-0.685	-4.027*
	(0.086)	(1.129)	(1.206)	(1.790)	(1.545)	(2.127)
Earning to price	-0.057	0.446	-0.168	0.212	0.569	-0.368
	(0.047)	(0.590)	(0.868)	(1.128)	(0.731)	(1.006)
Bid/Ask Spread	0.088	-0.718	-0.925	4.299	-1.549	1.581
	(0.129)	(1.878)	(1.990)	(2.652)	(2.278)	(2.988)
LnPastMarketValue	0.019	0.362	-0.024	0.19	-0.072	0.007
	(0.039)	(0.320)	(0.456)	(0.548)	(0.489)	(0.618)
% Tradable shares	-0.228	-1.129	2.158	-0.32	-7.551	0.927
	(0.328)	(3.010)	(4.120)	(5.975)	(5.137)	(7.003)
Price Range	0.097**	2.108***	(0.063)	(0.032)	0.203***	1.774***
	(0.043)	(0.284)	(0.108)	(0.360)	(0.072)	(0.314)
Turnover	0.106*	0.469	0.363**	1.419***	0.624***	1.608***
	(0.062)	(0.357)	(0.143)	(0.466)	(0.101)	(0.315)
Past Return			-0.945	-1.890**	0.121***	0.159***
			(0.707)	(0.861)	(0.033)	(0.047)
Compensation			27.377***	27.919***	-9.881*	-3.978
			(7.408)	(9.014)	(5.370)	(6.967)
Dummy cash			-8.754***	-7.419**	-1.578	-1.311
			(2.833)	(3.075)	(1.390)	(1.854)
Constant	0.122	-10.788***	-5.927	-7.462	-2.3	-18.806**
	(0.416)	(3.385)	(5.483)	(7.433)	(5.798)	(7.868)
Observations	997	997	672	672	997	997
R-sq	0.15	0.30	0.25	0.24	0.36	0.32

Table 10. Cross Sectional Analysis conducted on residuals from the Wang-Xu Model with Liquidity Replicating Portfolio. The table presents the results of cross sectional analyses where the independent variables are: speculation variables (turnover, price range as a proxy of current volatility, past returns), structural variables (earnings-to-price, size), governance variables (the percentage of legal shares, a dummy for B shares, and various concentration variables), reform-specific variables (a dummy equal to 1 for companies giving cash compensation, compensation). The cross section six times, to explain the change in prices (i) days between august 2005 and ten days before the first suspension, (ii) ten days before the first suspension (iii) on the day of the first readmission, (iv) between the first readmission and the second suspension, (v) on the day of the second readmission and (vi) ten days after the second readmission. Abnormal returns are obtained from the Wang-Xu model with liquidity-replicating portfolio and the pre minus after portfolio. Robust Standard Errors are reported in parentheses. Significance levels are denoted by (*) for 10 percent, (**) for 5 percent and (***) for 1 percent.

Before First Suspension				Aftern First Suspension				After Second Suspension			
Day	P-value 140 days	P-value 250 days	P-value 500 days	Day	P-value 140 days	P-value 250 days	P-value 500 days	Day	P-value 140 days	P-value 250 days	P-value 500 days
-10	0.524	0.533	0.580	0	0.017	0.015	0.020	0	0.106	0.118	0.104
-9	0.449	0.458	0.477	1	0.147	0.147	0.149	1	0.533	0.526	0.591
-8	0.347	0.385	0.393	2	0.112	0.138	0.144	2	0.681	0.712	0.729
-7	0.353	0.360	0.395	3	0.066	0.080	0.075	3	0.713	0.747	0.754
-6	0.366	0.369	0.383	4	0.049	0.053	0.061	4	0.700	0.727	0.728
-5	0.416	0.452	0.445	5	0.027	0.023	0.042	5	0.714	0.716	0.733
-4	0.382	0.412	0.399	6	0.011	0.014	0.029	6	0.687	0.695	0.702
-3	0.295	0.327	0.295	7	0.005	0.008	0.022	7	0.684	0.703	0.704
-2	0.103	0.104	0.138	8	0.004	0.009	0.016	8	0.648	0.668	0.667
-1	0.008	0.016	0.050	9	0.003	0.008	0.018	9	0.653	0.688	0.687

Table 11. Bootstrap robustness. The table reports p-values for our event study obtained by residuals estimated over three alternatives bootstrap estimation period of 140 days, 250 days and 500 days following the methodology described in the text.

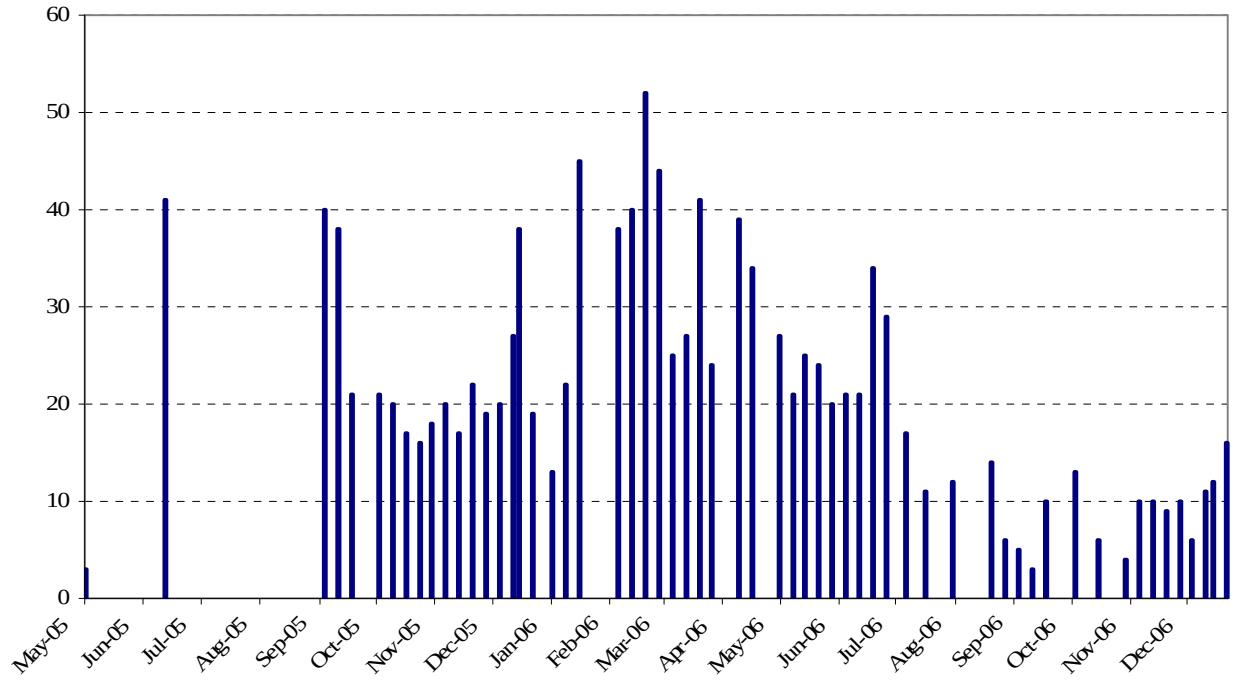

Figure 1. Batches of Companies. The figure reports the timing of the various batches and the number of companies entering each batch.

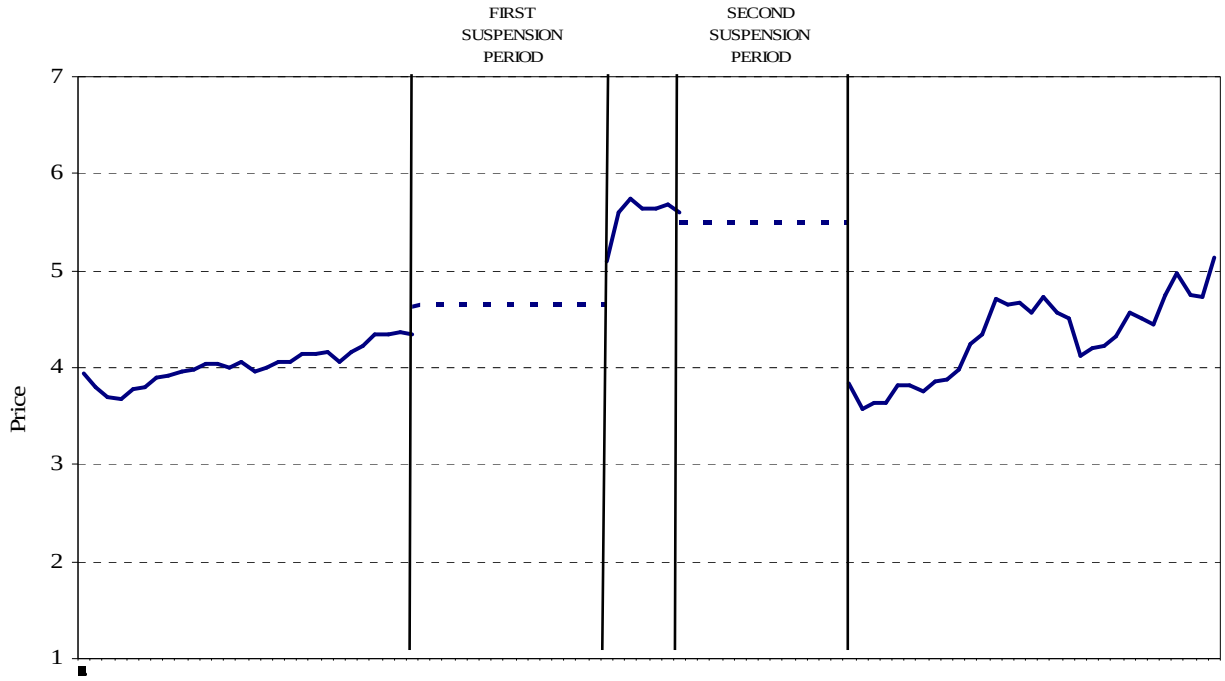

Figure 2. Baotou Huazi International Price. The figure shows the price for Baotou Huazi International during the reform process.

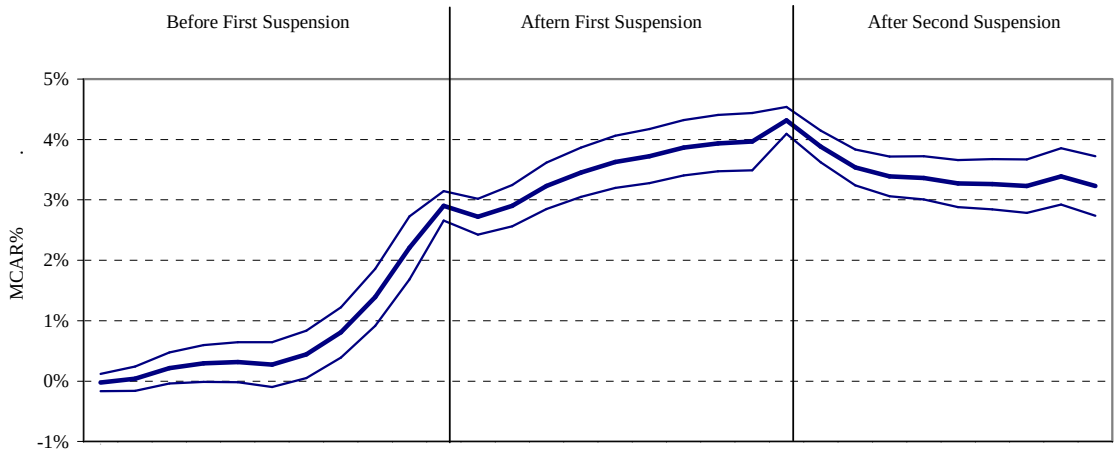

Figure 3. Mean Cumulative Abnormal Returns. The figure reports result of the MCAR analysis for the 1,007 companies included in our sample and their 95% confidence interval. Residuals are computed from the market model. The cumulative residuals are computed starting ten days before the beginning of the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

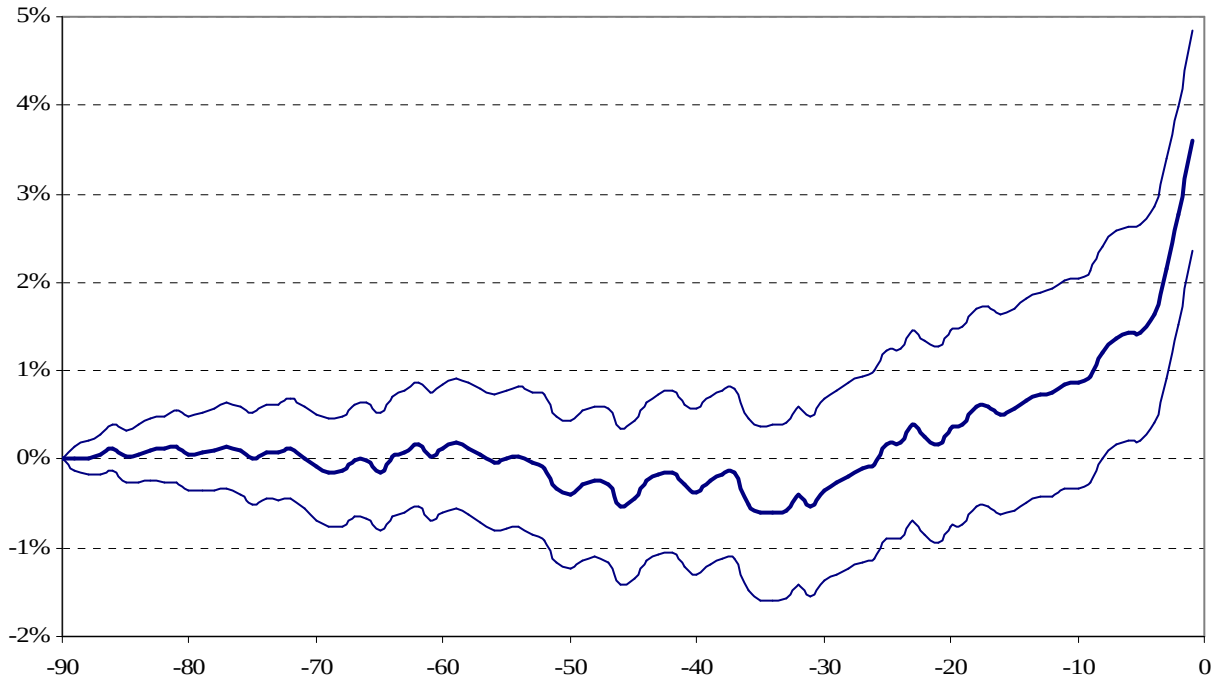

Figure 4. Mean Cumulative Abnormal Returns. The figure reports result of the MCAR analysis for the 1,007 companies included in our sample and their 95% confidence interval for the 90-day period before the first suspension. Residuals are computed from the market model. The cumulative residuals are computed starting ninety days before the beginning of the reform process.

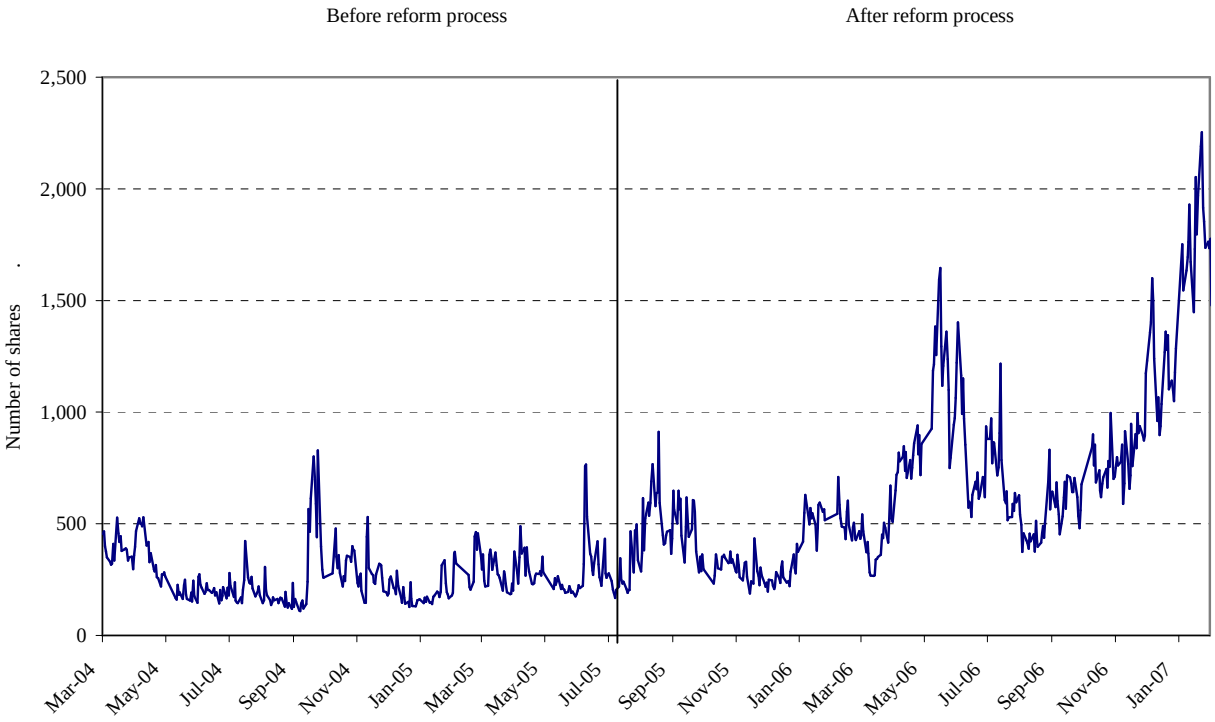

Figure 5. Daily Turnover. The figure reports the daily total turnover (million of shares traded on a given day) of the Shanghai and Shenzhen stock markets between March 2004 and February 2007.

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