DEPARTMENT OF ECONOMICS

DISCUSSION PAPER SERIES

The Impact on IPO Performance of Reforming IPO Allocation Regulations: An Event Study of Shanghai Stock Exchange A-Shares

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WP 2009 - 04

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The Impact on IPO Performance of Reforming IPO Allocation Regulations: An Event Study of Shanghai Stock Exchange A-Shares

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Working Paper, February 2009
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Abstract
Initial public offerings (IPOs) in China are distinguished from the IPOs in other developed and emerging markets by their extremely high abnormal initial returns and so-called Chinese Characteristics. Many policy changes have been made since the late 90s in order to regulate and promote the development of the Chinese primary stock market. This paper examines the effect on IPO underpricing and short-run performance of significant changes in Chinese IPO regulations implemented in May 2002, based on a sample of 209 Chinese IPOs from 2001 to 2003. The significant institutional event was a change in the method of allocating shares through IPO – in May 2002 a lottery allocation mechanism was changed in favour of allocation based on the market value of investors’ tradable shareholdings. Event study methodology is adopted and both parametric and non-parametric tests are performed. The results show an average abnormal initial return of 117.48%, which is lower than earlier Chinese IPOs but still much higher than IPOs in other markets. More importantly, the results reveal that abnormal initial returns decreased by 43.3% after the change in regulations, that beta risks of the IPOs increased and that an evenly-upward trend of cumulative abnormal initial returns was reversed to become evenly-downward. The reform may have influenced both investor demand for IPOs and the behaviour of noise traders, while trader reactions may have in turn changed the liquidity of the secondary market, affecting the degree of IPO underpricing. The phenomenon is consistent with the Information Cascade Hypothesis (Welch 1992) and the Bandwagon Hypothesis (Ritter 1998). Further areas for research into the market microstructure of the Chinese stock market are suggested, with possible implications for policy makers, particularly with respect to decreasing IPO uncertainty (and the degree of IPO underpricing), increasing market liquidity and enhancing investor confidence.

JEL classification: G14; G28
Keywords: IPO underpricing; IPO allocation; Policy impact; Chinese stock market; Shanghai Stock Exchange A-shares
1. Introduction

Initial public offering (IPO) refers to the first sale of stocks by an unlisted company to the public. Stock exchange listing (followed by public trading in open market) allows the creation of market prices and liquidity. Information asymmetry and agency problems in the market make the valuation of IPOs more difficult than that of listed common stocks so an essential part of the IPO process is the discovery of an appropriate issue price. IPO pricing must compensate for both direct costs (such as underwriting and information disclosure fees) and indirect costs (such as unknown risks specific to the offering, as distinct from systemic risks generally involved in pricing listed common stocks). The complex and special nature of IPO pricing is reflected in an ‘IPO underpricing’ phenomenon, in which statistically significant positive abnormal returns are widely observed in the first day of trading.

The IPO underpricing anomaly is well documented in the literature and has been observed almost in every stock market in the world, although the level of abnormal initial return varies considerably across countries and over time. The degree of underpricing has been found to depend on particular market circumstances (different trading mechanisms, market liquidity, regulation status, etc.). For instance, Loughran et al. (1994) revealed abnormal initial returns that varied from a low of only 4.2% in France (1983-1992) to a high of 80.3% in Malaysia (1980-1991) while Ritter (1998) found a higher average level of abnormal initial returns in 13 emerging markets (40.8%) than in 20 developed markets (19.6%). In a study of particular interest in the context of this paper, for East Asian markets Loughran et al. (1994) found a lower average level of underpricing in the 90s than in the 80s that apparently resulted from a reduction in regulatory interference.

Launched in the 80s, established in 1990 and developing during the period of...
transition from central planned economy to market economy, the Chinese stock market is distinguished for its *Chinese Characteristics*. Significant uncertainty in the process of privatization and economic transition caused severe asymmetric information problems in the immature Chinese market. Without exception, empirical studies of Chinese IPOs have found extraordinarily high abnormal initial returns. In addition, it has been shown that the degree of underpricing is sensitive to the period sampled. Thus, Su and Fleisher (1997) documented an abnormal initial return as high as 948.59% for 1987 to 1995; Mok and Hui (1998) found lower (but still substantial) underpricing of 289% for 1990 to 1993 while Chan *et al.* (2001) reported underpricing of 178% for 1993 to 1998. This may reflect the general (and continuing) regulatory and microstructural development of Chinese markets, making for interesting natural experiments on the impact of policy reform, particularly with respect to IPO regulation.

In this paper, we exploit a particular natural experiment created by the IPO allocation reform of May 2002 which saw a change in the IPO lottery allocation mechanism.

We investigate the impact of the reform by comparing underpricing and cumulative abnormal returns before and after the change, using event study methodology for data from 2001 to 2003. Any change in IPO policy (and the consequent change in market microstructure) is likely to alter IPO costs and be reflected in IPO performance. This research therefore sheds light on the relationships between IPO costs, IPO pricing, market liquidity and market microstructure, with implications for issuers, underwriters and policy markers.

The remainder of this paper is structured as follows. Section 2 discusses the theoretical background of this study. Sections 2 and 3 present the data and methodology, Section 5 presents results and Section 6 provides concluding remarks.

### 2. Chinese IPO Regulatory Reform and Theories of IPO Performance

From 1996 to May 2002, the odds of being allocated IPO shares were determined by the amount of money in the subscription. For large investors (generally institutional or
other better informed investors) with a large proportion of funds already invested in the secondary market, the costs of subscribing to IPOs therefore included an opportunity cost of cashing in stocks from the secondary market (a trade-off between winning the lottery against giving up future gains on existing shareholdings). They would therefore have been unlikely to enter an IPO unless convinced that such opportunity cost would be covered. After May 2002 the odds and amount of IPO share allocation were determined by subscribers’ existing holdings of tradable shares. This greatly reduced the costs of subscribing IPOs for large investors, since they were no longer required to risk their existing shareholdings in order to increase the chance of winning a ‘good’ IPO. On the other hand, speculators who before the reform could have used all their funds to chase IPOs in the primary market were ‘punished’ after the reform. We should therefore find an impact on market demand for IPOs of changing the incentives for different types of investors. In addition, the new regulation may have also encouraged continuing investment in the secondary market and thus had a positive influence on its liquidity.

There was, however, considerable debate over this regulation change with dispute about its impact on investor demand for IPO. In particular, it was argued that the reform was neither of benefit to smaller investors nor motivated institutional investors, and hence failed to promote the stability of the market (Hong, 2006).

Changes in investor demand for IPOs should in the first instance affect IPO pricing, with consequent effects on IPO performance. In moving from the primary to the secondary market, risky IPO stocks undergo a price discovery process. It is well established that this process produces anomalies in IPO performance on the initial day of open trading. Stoll and Curley (1970), Reilly (1973), Logue (1973) and Ibbotson (1975) have all documented significant and systematic increases from offering to first-day closing prices in the US market. This underpricing phenomenon appears to violate the efficient markets hypothesis, since investors are apparently willing to pay much higher prices in the secondary market than in the primary market very shortly beforehand while issuers are apparently willing to ‘leave money on the table’.
Since the 1970s, numerous empirical studies have provided international evidence on the underpricing anomaly in almost all of the world’s financial markets. Various theories have been developed, but no single theory completely resolves the anomaly – different theories find supporting evidence: in different markets and different periods, and under different microstructural and regulatory conditions.

Among the various underpricing theories, Welch (1992) and Ritter (1998) have respectively proposed ‘informational cascades’ and ‘bandwagon effects’ in stock markets. In this approach, less well informed investors make decisions by judging the interest of other investors. They subscribe only to IPOs they believe to be popular and refuse offerings that they believe other investors do not want (even when other favourable information may be available). Welch (1992) demonstrated that demand curves can be very elastic in the presence of informational cascades, leading to the rapid failure of offerings that are priced too high, even when issuers have favourable private information. To avoid failure therefore, issuers underprice their IPOs to attract better-informed investors and to induce positive cascades or positive bandwagon effects. Any change in IPO regulation could alter the elasticity of market demand for IPOs by changing the population of subscribers. In addition, if the market for IPOs is subject to competitive pressure then, ceteris paribus, we should expect any simple increase in the number of IPO subscribers to lead to a reduction in underpricing.

It is arguable that Chinese culture and social behaviour since the revolution has been more strongly influenced by the perceived desirability of ‘collective action’ than is the case elsewhere, and we may conjecture that Chinese markets are therefore particularly vulnerable to informational cascades and bandwagon effects. If we accept this argument, then it follows that if the IPO regulatory reform of May 2002 gave better-informed investors increased opportunities to subscribe to IPOs at the expense of less well-informed investors then this should have led to a decrease in the elasticity of IPO demand, reducing the risk to issuers of adverse bandwagon effects and IPO failure, inducing higher IPO prices and a decrease in underpricing. Of course, the same outcome should emerge if the effect of the reform was either to increase the
number of subscribers or the total amount subscribed while holding informational asymmetry constant – increased competition between subscribers and/or higher total IPO demand should lead to a higher IPO price (a decrease in underpricing). Unfortunately we have no data on the types or numbers of IPO subscribers, so these possibilities cannot be disentangled.

An alternative view arises from the argument given earlier (Hong, 2006), that the reform may not only have been of no benefit to smaller investors but may have also failed to motivate institutional investors. If Hong is correct, we should expect to see a net decrease in IPO demand, leading to a net reduction in the IPO price (an increase in underpricing), other things being equal.

Changes in investor demand for IPOs may also have impact on market microstructure through changes in the number and types of traders in the post-issue market. This would be consequently reflected in post-IPO price performance. The theory that links the market microstructure, IPO pricing and post-IPO performance is not well-developed but trader behaviour models of market microstructure may inform our predictions of post-IPO performance. For example, De Long et al. (1991) showed that noise traders (less well informed investors) can survive in the market and can even earn high returns at the expense of informed traders if they can exert pressure on prices collectively. Small numbers of noise traders have little power to move prices away from fundamental value but an increase in the number of noise traders may eventually distort prices. Following De Long et al. (1991), any impact of the 2002 IPO reform on the type of traders should be reflected in the price discovery process in the secondary market for the IPO stocks (post-IPO performance). Unfortunately, as before, we have no way of estimating changes in the classification of traders by type. However, if the reform led to a relative increase in general market participation by noise traders we might expect, ceteris paribus, a greater degree of both price volatility and prolonged abnormal returns in the after-market, while the reverse would be true if the reform encouraged greater participation by informed traders.
Data

The Chinese IPO market is characterised by immaturity and frequent regulatory reform. To avoid any confounding effects from other regulation changes, after the consideration of various factors the sample period was chosen as 2001 to 2003.

i. Since 2001, the Offering Censorate has taken on the role of the CSRC (China Securities Regulatory Commission) in regulating IPO supply. Recommendations on IPOs have been made by investment banks, whereas they were previously made by local regulatory authorities.

ii. In mid-1999, the fixed pricing method was modified (book-building became predominant after 2001).

iii. After Oct. 2000 the Shenzhen Stock Exchange (SZSE) was closed to IPOs, leaving the Shanghai Stock Exchange (SSE) as the only IPO market from 2001 to 2003.

iv. From 2001 the Chinese stock market turned from bull to bear, maintaining a downward trend during 2001-2003, as shown in Figures 1 and 2 (SSE and SZSE respectively).

These considerations suggest that the period 2001-2003 is relatively stable in terms of both policy environment (only one regulation change was made, which is the focus of this research) and market performance (a consistent trend).

The data include all A-share IPOs floated on SSE during 2001-2003 – a total of 209 IPOs. B-share IPOs were excluded both because the A and B markets are segmented and because A-shares can be thought to better evince ‘Chinese Characteristics’.

For each of the 209 IPOs, the offer price was collected from www.cnlist.com while daily closing prices for 60 trading days after IPO were collected using software provided by www.gw.com.cn.
Figure 1. Shanghai Stock Exchange Index, 1996 to 2004

Market Trendline of SSE Composite Index
01/1996 - 01/2004 (monthly data)

Source: http://www.cnlist.com

Figure 2. Shenzhen Stock Exchange Index, 1996 to 2004

Market Trendline of SZSE Composite Index
01/1996 - 01/2004 (monthly data)

Source: http://www.cnlist.com
The 209 IPOs were divided into two groups, by allocation method. Group I (88 companies) consists of pre-reform IPOs floated from Jan 2001 to May 2002 (lottery allocation odds determined by *subscription amount*). Group II (121 companies) consists of post-reform IPOs floated from Jun 2002 to Dec 2003 (allocation odds determined by the *market value of tradable shareholdings*). The main characteristics of the sample are listed in Table 1.

### Table 1. Characteristics of the Sample – SSE A-shares

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time period</strong></td>
<td>Jan 2001-May 2002</td>
<td>Jun 2002-Dec 2003</td>
</tr>
<tr>
<td><strong>IPO pricing method</strong></td>
<td>Book-building pricing</td>
<td>Book-building pricing</td>
</tr>
<tr>
<td><strong>IPO allocation method</strong></td>
<td>Lottery mechanism, allocation odds determined by subscription amount.</td>
<td>Lottery mechanism, allocation odds determined by tradable shareholdings.</td>
</tr>
<tr>
<td><strong>Number of IPOs</strong></td>
<td>88</td>
<td>121</td>
</tr>
</tbody>
</table>

Source: http://www.cnlist.com

4. Methodology

**Daily abnormal returns**

Standard event study methodology was used to test for the impact of the regulatory change on IPO performance. The event window was 21 days, from the listing day until the 20th trading day. The daily abnormal returns over the event window were calculated for the sampled IPOs, using the Market Model (1) to compute the expected returns. This allows abnormal returns to be estimated relative to the beta risk of each stock.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$$  (1)
Because there are no observable trading prices before listing, a post-event window of 40 trading days (day 21 to day 60) was used as an estimation window for computing the alpha and beta parameters. The procedure and chronology of calculating the daily abnormal return are illustrated in Figure 3 and explained as follows:

The actual event window daily return, \( R_{it} \), is defined as \( R_{it} = \frac{P_{it}}{P_{i(t-1)}} - 1 \), where \( P_{it} \) is the closing price for IPO stock \( i \) (\( i = 1, \ldots, 209 \)) on day \( t \) (\( t = 1, \ldots, 20 \)).

Expected daily return (i.e. normal return) over the event window is defined as:

\[
E(R_{it} | X_t) = \alpha_i + \beta_i R_{mt}
\]  
(2)

Here \( X_t \) is conditioning information supplied by the market model on day \( t \), \( \alpha_i \) is a constant term for IPO stock \( i \) (measuring the part of returns that is independent of the market index), \( \beta_i \) is the systemic risk for stock \( i \) and \( R_{mt} \) is the market return on day \( t \), calculated from the Shanghai Stock Exchange A-Share Index. \( \alpha_i \) and \( \beta_i \) are estimated by the market model for the post-event window (\( t = 21, \ldots, 60 \)).

The daily abnormal return over the event window is defined as:

\[
AR_{it} = R_{it} - E(R_{it} | X_t)
\]  
(3)

**Figure 3. Estimation of Abnormal Return (AR) Using the Market Model**

- **Event window**
  - AR derived
  - Listing day

- **Estimation window (post-event)**
  - 21st trading day
  - \( \alpha \) and \( \beta \) estimated
  - 20th trading day
  - 60th trading day
  - Market Model employed
**Aggregation of daily abnormal returns**

Abnormal performance was aggregated for each IPO stock $i$ from day 1 until day $T$ ($T = 1 \ldots 20$). Both cumulative abnormal returns (CAR) and buy-and-hold abnormal returns (BHAR) were calculated. The CAR method assumes that a portfolio is re-balanced in each period (every day in this case), whereas the BHAR method gives the abnormal return from the initial day until the target day (no rebalancing at any point). Lyon *et al.* (1999) have argued that the CAR approach is to be preferred if the aim is to measure whether or not the sample persistently earns abnormal returns over time. On the other hand, BHAR can precisely measure investor experience. In addition, Gompers and Lerner (2003) have suggested that the choice between CAR and BHAR largely depends on the trading strategy. Since both methods have their own advantages, we calculate both. The cumulative abnormal return (CAR) for IPO stock $i$ over period $(1,T)$ is defined as

$$\text{CAR}_i(1,T) = AR_{i1} + \cdots + AR_{iT} = \sum_{t=1}^{T} AR_{it} \quad (T = 1 \ldots 20)$$  \hspace{1cm} (4)

The cross-sectional average CARs for the two groups of the sample are

$$\text{CAR}_{I}(1,T) = \frac{1}{88} \sum_{i=1}^{88} \text{CAR}_i(1,T) \quad (T = 1 \ldots 20) \quad (\text{Group I, pre-reform})$$  \hspace{1cm} (5)

$$\text{CAR}_{II}(1,T) = \frac{1}{209} \sum_{i=89}^{209} \text{CAR}_i(1,T) \quad (T = 1 \ldots 20) \quad (\text{Group II, post-reform})$$  \hspace{1cm} (6)

The buy-and-hold abnormal return (BHAR) for IPO stock $i$ over the period $(1,T)$ is

$$\text{BHAR}_i(1,T) = \prod_{t=1}^{T} \left(1 + R_{it}\right) - \prod_{t=1}^{T} \left(1 + E(R_{it} | X_t)\right) \quad (T = 1 \ldots 20)$$  \hspace{1cm} (7)

The cross-sectional average BHARs for the two groups of sample are:

$$\text{BHAR}_{I}(1,T) = \frac{1}{88} \sum_{i=1}^{88} \text{BHAR}_i(1,T) \quad (T = 1 \ldots 20) \quad (\text{Group I, pre-reform})$$  \hspace{1cm} (8)

$$\text{BHAR}_{II}(1,T) = \frac{1}{209} \sum_{i=89}^{209} \text{BHAR}_i(1,T) \quad (T = 1 \ldots 20) \quad (\text{Group II, post-reform})$$  \hspace{1cm} (9)
Hypotheses

The null hypotheses are that the IPO reform had no impact on either IPO underpricing or post-listing performance. From our earlier discussion we propose alternative underpricing hypotheses: (i) success in stimulating IPO participation, particularly by better-informed investors, should lead to a reduction in underpricing and (ii) reduction in IPO participation should lead to an increase in underpricing. After-market performance is necessarily related to the degree of underpricing, since a reduction (increase) in underpricing should be followed by a reduction (increase) in abnormal performance. However, the time paths of after-market performance are not as predictable. Alternative after-market hypotheses are: (i) a relative increase in market participation by better-informed investors should induce quicker and smoother adjustment to normal pricing and (ii) that an increase in participation by noise traders should lead to prolonged and more volatile abnormal performance.

Both parametric (two-sample mean-comparison t-test) and non-parametric tests (two-sample Wilcoxon rank sum test) were performed.

i. Testing for cumulative abnormal return (CAR)

\[ H_0 : \overline{CAR}_I(1,T) \text{ is not significantly different from } \overline{CAR}_{II}(1,T), \quad (T = 1\ldots20) \]

\[ H_1 : \overline{CAR}_I(1,T) \text{ is significantly different from } \overline{CAR}_{II}(1,T), \quad (T = 1\ldots20) \]

ii. Testing for buy-and-hold abnormal return (BHAR)

\[ H_0 : \overline{BHAR}_I(1,T) \text{ is not significantly different from } \overline{BHAR}_{II}(1,T), \quad (T = 1\ldots20) \]

\[ H_1 : \overline{BHAR}_I(1,T) \text{ is not significantly different from } \overline{BHAR}_{II}(1,T), \quad (T = 1\ldots20) \]
5. Empirical Results and Analysis

**Pre- and post-reform IPO underpricing**

As shown in Table 2, average underpricing (conventionally measured by the percentage change from the offer price to the closing price of the first trading day) is 117.48% for the whole sample period 2001-2003 – a high level, although less than reported for earlier Chinese IPOs. It is evident that the average AR for the first trading day is very similar to the average return for the initial day (the degree of underpricing). In addition, both underpricing and AR were substantially reduced after the May 2002 IPO allocation reform, with an average decrease of 43.3% and 43.42% respectively.

<table>
<thead>
<tr>
<th>Pre-Reform 01/2001-05/2002</th>
<th>Post-Reform 06/2002-12/2003</th>
<th>Overall Period 01/2001-12/2003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Underpricing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4255</td>
<td>0.9925</td>
<td>1.1748</td>
</tr>
<tr>
<td><strong>First day abnormal return (AR)</strong></td>
<td>1.4275</td>
<td>0.9933</td>
</tr>
</tbody>
</table>

We explain the decrease in underpricing by conjecturing that the post-reform allocation method increased the attractiveness of IPO subscription, in particular to better-informed investors, thereby increasing overall IPO demand and simultaneously decreasing the need for issuers with little information about demand to underprice their IPOs to ensure success. It appears that the IPO reform may have increased the odds of winning an IPO ‘lottery’ for large investors, thereby encouraging subscription, increasing overall IPO demand and leading to a decrease in underpricingii.

**Pre- and post-reform CARs and BHARs**

Figures 4 to 7 show the change in aggregated abnormal return over the event window for pre- and post-reform periods. Table 3 summarises t-test and Wilcoxon test statistics for the impact of the reform. The two aggregation methods (CARs and
BHARs) provide rather different trend lines over the 20 trading day event window – that is, daily re-balancing (CARs) and no re-balancing (BHARs) produce different cumulative abnormal returns.

**Figure 4.** $\overline{\text{CAR}_i(1,T)}$ $(T = 1\ldots20)$ for Post-IPO Trading Days 1 to 20:

Average CAR before the IPO Reform

**Figure 5.** $\overline{\text{CAR}_{II}(1,T)}$ $(T = 1\ldots20)$ for Post-IPO Trading Days 1 to 20:

Average CAR after the IPO Reform
Figure 6. $\overline{BHR}_{i(1:T)}$ ($T = 1\ldots20$) for Post-IPO Trading Days 1 to 20:

Average BHAR before the IPO Reform

Figure 7. $\overline{BHR}_{ii(1:T)}$ ($T = 1\ldots20$) for Post-IPO Trading Days 1 to 20:

Average BHAR after the IPO Reform
Table 3. Statistical Significance of the Difference between the Aggregated Abnormal Performance before and after the Reform

<table>
<thead>
<tr>
<th>Aggregated Abnormal Performance</th>
<th>Pre-Reform 01/2001-05/2002</th>
<th>Post-Reform 06/2002-12/2003</th>
<th>Two-Sample Mean-Comparison t-test (paired)</th>
<th>Wilcoxon Rank Sum Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR(1,T)</td>
<td>20 1.4370 0.0062</td>
<td>20 0.9909 0.0021</td>
<td>340.1618***</td>
<td>5.410***</td>
</tr>
<tr>
<td>BHAR(1,T)</td>
<td>20 1.4066 0.0089</td>
<td>20 0.9741 0.0108</td>
<td>147.3975***</td>
<td>5.410***</td>
</tr>
</tbody>
</table>

Note: *** p<0.001

These phenomena demonstrate different after-market reactions in the pre- and post-reform periods. There are apparent differences in abnormal returns both (i) between the methods of aggregation (CAR and BHAR) and (ii) between the pre- and post-reform groups within each method of aggregation. In particular, for both methods there appears to be greater reduction in post-reform abnormal returns than in pre-reform abnormal returns, over the 20-day after-market window. In theory, trading by investors on the open market after listing should rapidly move IPO offer prices to their market equilibrium, so the greater degree of price adjustment evident in the post-reform period may indicate an increase in efficiency. If traders tend to overestimate the precision of their information (Daniel et al., 1998) then prices may over- or under-react to new information. Before the reform, given the low odds of obtaining an allocation, the high initial returns gained by successful subscribers may have caused traders to over-estimate the value of IPOs, leading to an accumulating (CAR) or relatively (BHAR) strong abnormal performance over the event window. This effect could have been magnified by the aggregate behaviour of less well informed traders or irrational noise traders (De Long et al., 1991). However, after the reform it seems that offer prices were closer to market value and provided weaker signals for over-reaction and irrational trading, reflected in the more restrained CAR and the clearly falling BHAR.
Another possible explanation is that the reform may have improved secondary market liquidity, both in general and for newly-listed (IPO) stocks in particular. Tying the odds of a successful IPO subscription to tradable shareholdings may have encouraged investors to trade in the secondary market and to increase their shareholdings so as to become eligible for future IPO subscriptions. New investors may also have been encouraged to enter the secondary market for the same reason. Given that successful IPOs are ‘good’ stocks, at least in the short term, investors may have been more encouraged post-reform to trade these stocks in particular, increasing market liquidity and improving market efficiency relative to the pre-reform period.

*Pre- and post-reform changes in beta risk*

The distributions of beta (Figures 8 and 9) during the pre- and port-reform periods are slightly different, with the average beta being slightly higher after the reform, at 0.9360, although this change is not statistically significant. In any case, the betas were estimated from post-event data (because of the lack of historical prices for new issues) so that the observed change in beta is in any case hard to interpret. Nonetheless, this result is consistent with the view that the reforms may have shortened the average post-listing length of time for which newly-listed stocks were particularly subject to ‘herd’ behaviour and/or investor over-reaction. In the pre-reform period such behaviour could have led to both high returns and low sensitivity of the IPO stocks to otherwise relevant market signals. Increased market efficiency in the post-reform period may have encouraged investors to pay more accurate attention to market signals when trading IPO stocks, leading to the observed increase in average beta. For the whole sample period the average beta is less than 1, implying that on average the IPO stocks are slightly less risky than the market index for A-shares in China. This finding is quite different from the results of Balvers *et al.* (1988) who found that the systematic risk of new issues was greater than that of the market index.
Figure 8. Beta Risk of Pre-Reform IPOs (01/2001-05/2002)

Mean (Median) beta of the 88 IPOs is 0.8774 (1.0156).

Figure 9. Beta Risk of Post-Reform IPOs (06/2002-12/2003)

Mean (Median) beta of the 121 IPOs is 0.9360 (1.0094).
6. Conclusions

This paper has reported an event study of the impact of the May 2002 IPO allocation reform on the short-run performance (one-month post-listing) of 209 Chinese A-share IPOs, with abnormal initial returns computed using CAR and BHAR methods. The IPO allocation reform altered the way that odds of winning the IPO ‘lottery’ were determined. Prior to the reform the odds of success in the allocation lottery depended on the amount of the investor’s subscription bid, while after the reform the odds were determined by the size of the investor’s existing holding of tradable shares.

It is found that from 2001-2003 the average abnormal initial return (underpricing) of Chinese A-share IPOs was 117.48%, lower than for earlier Chinese IPOs but still very high by international standards. Significant pre- and post-reform differences in underpricing and post-listing cumulative abnormal returns (CAR and BHAR) were found, suggesting that the reform of the IPO allocation lottery mechanism significantly lowered the degree of underpricing and probably improved market efficiency. We argue that these results are consistent with the view that the reform encouraged greater participation by larger better-informed investors, decreasing the elasticity of IPO demand and increasing total IPO demand. Following the Information Cascades and Bandwagon hypotheses, which may be particularly relevant to Chinese markets, these effect would reduce the need for issuers to under-price their IPOs to ensure success. There is also a suggestion (albeit non-significant) that the average sensitivity of IPO returns to the market index (beta) increased after the reform, which is consistent with an increase in market efficiency. The observed after-market post-reform changes may also have arisen from the influence of the reform on investors’ post-listing demand for stocks in general and IPO stocks in particular. Finally, the post-reform reduction in the degree of IPO underpricing may have increased secondary market liquidity, and hence reduced the cumulative abnormal returns in the after-market. Further research on the market microstructure of the Chinese stock market is suggested, to clarify the impact of IPO regulatory reform on IPO uncertainty, market efficiency and investor confidence.
References


Notes

High equity retention by the state, government control and restricted IPO supply. The Chinese government has a large equity holding in state-owned enterprises – shares not tradable on the stock market but constituting the major part of all outstanding stock. A reduction in government ownership would promote stock market growth but this has still to be implemented. Until this problem is resolved the supply of IPOs to the market may be seriously limited. For example, although investment banks were introduced to the IPO approval process in order to certify IPO quality after the 2001 IPO policy change, the aggregate IPO supply remains largely in the control of government. Furthermore, because the Chinese stock market is still relatively undeveloped and there are limited investment instruments, IPO supply is barely able to meet investment demand. Basu and Li (2000) have also argued that bureaucrats possess inside information about which companies would be most likely to succeed, so that underpricing is used to compensate outsiders and to signal a trustworthy future.

Two types of tradable shares on SSE/SZSE and segmented A-share and B-share markets. A-shares are ordinary shares sold to Chinese citizens and qualifying foreign institutions; B-shares are sold to foreign investors. The A-share and B-share markets are segmented. According to Chen (1997), the two types of share carry equal voting rights and obligations for any given company but the offering and trading prices of A-shares are about twice as high as those of B-shares. Poon et al. (1998) attribute this to a lack of investment opportunities for domestic investors. A-shares are also more underpriced than B-shares. Chen et al. (2000) linked the A-share underpricing to firm risk and high government shareholdings and B-share underpricing to seasoned equity offerings (SEOs) and government ownership. In addition, Mok and Hui (1998) argue that B-share investors are better informed than A-share investors, due to different disclosure requirements and underwriter reputation. Finally, the time lag between offering and listing are longer for A-shares than for B-shares. Chen et al. (2000) documented an average time lag of 10.71 months for A-shares against 1.46 months for B-shares.
Allocation methods and changes in government regulation. The share allocation method has been changed several times, but broadly in two phases. Before 1996, the allocation of IPO shares to investors was made via application forms by computer system. After 1996, the allocation was carried out through a lottery mechanism. There was an important regulatory reform implemented in May 2002, during the second phase, when the mechanism was changed in favour of a lottery allocation based on the market value of investors’ tradable shareholdings. After May 2002, investors were able to subscribe to new issues only if they already owned tradable shares while the amount of the new shares subscription was determined by the quantity of their tradable shareholdings – the more the existing shareholding, the higher the probability of winning the IPO ‘lottery’. Before the May 2002 policy reform the odds of winning the ‘lottery’ depended on the money spent on the subscription. There was considerable debate on this regulation change in terms of whether it helped to promote the stability of the market.

ii Decreasing market returns in general do not appear to explain the decrease in underpricing, because post-reform decreases in market returns were actually smaller than pre-reform decreases.