Chinese IPO Activity, Pricing, and Market Cycles

1. Introduction

Over the period 1991 to 2001, the average number of Chinese A share initial public offerings (IPOs) exceeded 100 issues per year.[1] However, that number varied significantly over time, from as few as 6 during the starting year 1991 and 24 in 1995 to as many as 203 in 1996 and 205 in 1997. These IPOs raised about 360 billion Yuan ($45 billion) in aggregate gross proceeds, an average of about 320 million Yuan ($40 million) per deal.[2] Using the closing prices at the end of the first trading day, these IPOs earned an equally-weighted average first day return of 268.99% and a value-weighted average first day return of 122.56%, leaving around 440 billion Yuan ($55 billion) on the table.[3] An investor who bought the IPO shares at the first day closing prices and held the shares for one, two, or three years would have earned market-adjusted average cumulative returns of 4.27%, 8.46% and 5.92%, respectively. However, many Chinese IPO phenomena are not stationary over time and stock market cycle, or across industry, firm age, offer price, and offer size. Factors such as firm age which serves as a proxy for IPO quality, offer

[1] There are two types of stocks in China. The A shares are denoted in Yuan for Chinese investors and the B shares are denoted in dollars for foreign investors. Since the B share IPO market is small in size this paper focuses on the A share IPO market. The majority of Chinese A share IPOs are partial privatisation IPOs. In general, there are three major groups of shareholders for each A share IPO: the government and its agency, other legal entities that include institutional investors, and individual investors, each with about one third of the holdings. Only shares issued to individual investors are floating in the open market for trading.

[2] Yuan is the unit of Chinese currency. The current exchange rate is around $1/8.00 Yuan, based on which aggregate gross proceeds, money left on the table, and offer size per deal are converted.

[3] Aggregate gross proceeds and money left on the table are not inflation-adjusted.

price which captures excess demand for new IPO shares, and offer size that catches firm size explain cross-sectional short- and long-run IPO returns. In addition, monthly Chinese IPO volume and average initial returns are highly correlated.

These results summarize the patterns of Chinese IPO activity, pricing, and market cycles. Some of them are consistent with previous findings with U.S. IPO data, but others are not. Using 6,249 U.S. IPOs over the period 1980 to 2001, Ritter and Welch (2002) report an average initial return of 18.8%, suggesting a significant short-run underpricing relative to initial offer prices for U.S. IPOs.[4] However, if an investor purchased the IPO shares at the first day closing prices and held them for three years, the IPOs' average cumulative return would be 23.4% lower than the CRSP value-weighted market index and 5.1% lower than the benchmark companies with similar characteristics, an indication of underperformance in the long-run. They also find that many IPO phenomena in the U.S. IPO market are not stationary. For instance, the average first day returns fluctuate over time, from as low as 3.6% in 1984 to as high as 71.7% in 1999. The three-year buy-and-hold average returns range from -64.7% in 2000 to 82.2% in 1980.

[4] Ritter and Welch (2002) exclude certain IPOs in their study. In this paper, I consider all the A share IPOs, including bank IPOs and IPOs with an offer price of 1.00 Yuan for several reasons. First, I would like to examine the IPO activity for the entire sample. Second, there are 85 IPOs with an offer price of 1.00 Yuan in the sample, which is not a trivial number (more than 7.5% of all the issues). Third, the offer price in the Chinese IPO market is low and sometimes is not significantly greater than 1.00 Yuan. Nevertheless, I redo all the analysis after excluding 6 bank IPOs and 85 IPOs with an offer price of 1.00 Yuan and find that the equally-weighted and value-weighted average initial returns drop to 173.70% and 115.71%, respectively. However, the main conclusions do not change. Throughout the paper, I use the first day return and initial return interchangeably.

In addition to studying the U.S. IPO market, researchers have also focused on international IPO markets. Loughran, Ritter, and Rydqvist (1994), among others, report more severe initial underpricing in emerging markets than in developed markets. In recent years Chinese IPOs have received attention. With earlier data, Mok and Hui (1998), and Chan, Wang, and Wei (2004) all report that Chinese A share IPOs earn the world's highest average initial returns. Using the data from 1996 to 2000, Chi and Padgett (2005) find that the average initial return for Chinese IPOs is around 130%.

Besides examining IPO pricing, researchers have focused on the relationship between IPO volume and average initial returns. Ibbotson, Sinderlar, and Ritter (1988, 1994) document, and Lowry and Schwert (2002) confirm that there exist pronounced market cycles in the number of new issues per month and the average initial returns in previous months. The average initial returns lead IPO volume, suggesting that more companies tend to go public following periods of high initial returns.

In this paper, I examine a larger data set which provides an opportunity to study and compare the short- and long-run IPO performance over a longer time frame and stock market cycle, or across different industry, firm age, offer price, and offer size. I find that the short- and long-run average IPO returns are huge and often significantly different from year to year, period to period, during rising and declining stock markets, or across firm age, offer price, and offer size, but usually are not statistically different across industries. To explain IPO pricing, I propose a regression model with three factors to capture IPO quality, excess demand, and firm size and find that the model explains cross-sectional short- and long-run IPO returns. Finally, I investigate the lead-lag relationship between monthly IPO volume and average initial returns and find that there exists a

significant cross correlation between them. High initial returns tend to lead more IPOs in the next 6-9 months, which in turn is followed by periods of lower initial returns in next 10-12 months.

The rest of the paper is organized as follows. Section 2 provides background of the Chinese IPO market and Section 3 discusses the data set. Section 4 presents the methodology and the proposed regression model. Section 5 reports empirical results and Section 6 concludes the paper.

2. Features of Chinese IPO Market

Chinese stock markets were established in the early 1990s as part of the economic reform to provide state-owned enterprises new channels to raise money by partially privatizing their ownerships.[5] A company can issue both A shares and B shares with equal voting rights and dividends, although the B shares are usually sold at a discount due to less demand and illiquidity resulting from entry barriers for Chinese investors.[6]

During the period 1991 to 2001, there are 1,130 Chinese A share IPOs. As shown in Table 1, the number of IPOs in China varies from year to year. In 1991, there are only 6 IPOs initiated at the Shenzhen Stock Exchange. That number quickly increases to more than 100 in 1993 and 1994. In 1995, there is a big drop in Chinese IPO issuance. IPO

[5] There are two stock exchanges in China. The Shanghai Stock Exchange was established in late 1990 and initiated 628 Chinese A share IPOs over the sample period, starting from January 1992. The Shenzhen Stock Exchange was founded in mid 1991 and initiated 502 Chinese A share IPOs over the sample period, starting from October 1991.

[6] Since February 2001, Chinese investors are allowed to invest in B shares with foreign currencies. The price gap between A shares and B shares has narrowed since.

activity quickly regains its pace and reaches the peak during 1996 and 1997 with more than 200 new issues each year. Starting from 1998, IPO activity slows down and declines to 79 in 2001.[7]

Similar to the roles the Securities Exchange Commission (SEC) plays in the U.S. IPO market, the China Securities Regulatory Commission (CSRC) approves all new issues each year with a quota system. The CSRC's approval is based on several criteria, such as geographical and regional considerations, industrial development and balance, companies' characteristics, and the market condition. In principal, a company with a strong past financial performance has a higher probability to be chosen to go public. Similarly, firms' seasoned equity offerings also need approval from the CSRC.

Unlike the U.S. IPO market where investment bankers typically help IPO firms determine offer prices, the CSRC usually sets the offer price for an IPO firm based on a preset formula that incorporates earnings per share (EPS) and price to earnings ratio (P/E ratio). EPS is taken from the company's annual report, while the P/E ratio is set by the CSRC to determine the offer price. The CSRC can adjust the offer price after receiving feedback from the market, similar to the procedure for new share subscriptions in the U.S. IPO market (Su and Fleisher, 1999). The CSRC also determines the timing of IPOs.

Compared to the allocation procedure of underwriting that majority U.S. IPOs adopt, most IPO shares in China are allocated through a lottery system, largely due to

[7] Similar to the U.S. IPO market which has cooled down significantly after the burst of stock market bubble in 2001, the Chinese IPO market has decelerated since 2001. Since 2005 the IPO activity in China has been temporally suspended.

excess demand for new issues.[8] Given a new issue, potential investors bid for it at a fixed offer price. For every one thousand shares an investor bids, she receives a number which enters into the lottery drawing. A random number generating scheme determines the final winners and each winner is entitled to purchase one thousand shares of the new issue at the offer price. As the demand for new shares far exceeds the supply, only a small portion of potential investors win the lottery. Therefore, Chinese IPOs are similar to "hot issues" with rationing in the U.S IPO market. Excess demand and limited supply cause huge initial returns.

3. Data Set

The entire sample includes 1,130 Chinese A share IPOs initiated at the Shanghai and Shenzhen Stock Exchanges over the period 1991 to 2001, with the return data extended to 2004 in order to examine the long-run performance of IPOs initiated in 2001. Table 1 provides summary statistics for the IPOs across different categories. The IPO activity starts in late 1991 at the Shenzhen Stock Exchange. The Shanghai Stock Exchange quickly joins the Shenzhen Stock Exchange in initiating new issues starting from early 1992 and has since been playing a more important role in the Chinese IPO market. In addition to examining the IPO performance each year and over the entire sample period, I also group IPOs into sub-samples either according to IPO timing or stock market cycles. Two sub-samples, separated based on IPO timing, include the first sub-period from 1991 to 1995 when the Chinese IPO market is premature and more

[8] Some argue that the lottery system is a better way to allocate new shares given huge initial returns of Chinese IPOs. Every potential investor has a fair chance to win the lottery.

volatile and the second sub-period from 1996 to 2001 after the Chinese IPO market has stabilized. The first sub-period contains 303 IPOs (about 27% of all IPOs), while the second sub-period contains 827 (about 73% of all IPOs). Two other sub-samples are composed based on stock market conditions: rising or declining stock markets. I define a rising stock market while the A share index rises by more than 30% from its previous low or a declining stock market while the index drops by more than 30% from its previous high on each of the Shanghai and Shenzhen Stock Exchanges. There are 733 IPOs issued during rising stock markets (about 65% of all IPOs) and 397 IPOs during declining stock markets (about 35% of all IPOs). I provide visual pictures of stock market cycles using the daily A share indices and returns on the Shanghai and Shenzhen Stock Exchanges in Figures 1 and 2, respectively.

In order to investigate IPO performance across different industries and the impact of firm age, offer price, and offer size on IPO pricing, I divide the entire sample into sub-groups according to the firm's industrial code, firm age, offer price, and offer size.[9] As shown in Table 1, the mean offer price tends to increase over time.[10] The mean number

[9] There are six broad industrial codes in China, forming six industrial groups. They are finance (0001), utility (0002), property (0003), conglomerate (0004), industrial (0005), and commerce (0006).

[10] An obvious exception occurred in 1992 when the Shanghai Stock Exchange initiated all its 21 IPOs with a higher book value (10 Yuan) and a higher average offer price (an average of 45.37 Yuan), yielding an overall average offer price of 26.37 Yuan in 1992. These IPOs with higher offer prices earned an average initial return of 220.55%, significantly lower than the average initial return of 420.37% for all the IPOs in 1992, lower than the average initial return of 268.99% over the entire sample period, and also lower than the average initial returns across all industries, suggesting offer price affects initial IPO returns. Starting from 1993, the Shanghai Stock Exchange began to adopt a book value of 1 Yuan along with lower offer prices to initiate new IPO shares, a typical way for all the other IPOs in the entire sample.

of shares offered rises over time as well, as does the offer size from about 65 million Yuan per deal in 1991 to 779 million Yuan per deal in 2001. Mean offer price and shares do not seem to be significantly different during rising or declining stock markets, but the offer size is significantly larger during rising stock markets with an average of 346 million Yuan per deal, compared to only 262 million Yuan per deal during declining stock markets. Aggregate gross proceeds fluctuate over time, depending on the number of IPOs and offer size of each IPO. Similarly, aggregate money left on the table varies with time, depending on the number of IPOs, offer size, and investors' enthusiasm towards the IPOs. The ratio of aggregate money left on the table over aggregate gross proceeds is the value-weighted average first day return. It fluctuates from 294.48% in 1993 to 81.95% in 2001. In general, the value-weighted average first day returns are much lower than the equally-weighted average first day returns, indicating that offer size affects initial IPO pricing.

There are only 6 IPOs in the finance industry over the entire sample period. The average offer size is 1,415 million Yuan, the largest among six industrial groups. The utility industry has 82 IPOs with an average offer size of 403.18 million Yuan, the second largest on average. The industrial group has the most IPOs with 692, followed by the conglomerate group with 211 IPOs. Both have similar offer sizes that are close to the overall sample average. The commerce group has the smallest average offer size of 164.85 million Yuan while the property group has the second smallest average offer size of 187.27 millions Yuan.

To further examine the impact of firm age, offer price, and offer size on IPO pricing, I divide the entire sample into six firm-age groups, six offer-price groups, and

five offer-size groups, respectively. The firm-age groups are divided based on the number of years the company has been in business before going public, varying from less than a year to more than or equal to 8 years. The offer-price groups are separated ranging from the lowest offer price of 1.00 Yuan to offer prices greater than 10.00 Yuan. The offer-size groups are separated by quintiles of gross proceeds, with those in the lowest category having an offer size of less than 70 million Yuan to those in the highest having an offer size of more than 438 million Yuan.

4. Methodology

Let us consider IPO *i* going public on date 1 with an offer price $P_{i,0}$. The first day return is given by

$$R_{i,1} = (\frac{P_{i,1}}{P_{i,0}}) - 1, \tag{1}$$

where $P_{i,1}$ is the closing price of the IPO on the first trading day. Analogously, the return on a market index on the same day, $R_{m,1}$, can be calculated. The equally-weighted average of first day returns for a group of *N* IPOs is calculated as

$$\overline{EWAR_1} = \frac{1}{N}\sum_{i=1}^{N} R_{i,1}. \tag{2}$$

The cumulative return for IPO *i*, CR_i, is simply the sum of $R_{i,t}$ over time.[11] The equally-

[11] I use *t* = 1, 5, 20, and 120 to examine the 1-, 5-, 20-, and 120-day cumulative returns for the short-run and *t* = 240, 480, and 720 to examine the one-, two-, and three-year performance for the long-run. The average number of trading days is around 240 per year in China. Some argue that a buy-and-hold strategy reduces bias in calculating cumulative returns, especially in the long-run. Therefore, I redo all the analysis using the buy-and-hold strategy and find that the results are very similar.

weighted average cumulative return for a group of N IPOs is

$$\overline{EWACR} = \frac{1}{N}\sum_{i=1}^{N} CR_i \ . \tag{3}$$

Define the market-adjusted return for IPO i on day t as the difference of the two

$$MAR_{i,t} = R_{i,t} - R_{m,t}\,, \tag{4}$$

where $R_{m,t}$ is the return of the A share stock index at the Shanghai Stock Exchange if IPO i is initiated at the Shanghai Stock Exchange. If IPO i is initiated at the Shenzhen Stock Exchange, then $R_{m,t}$ will be the return of the A share stock index at the Shenzhen Stock Exchange. The market-adjusted cumulative return of IPO i, $MACR_{i,t}$ is simply the sum of $MAR_{i,t}$ over time. The equally-weighted and market-adjusted average cumulative return for a group of N IPOs, $\overline{EWMACR}$, can be calculated the same way as in equation (3). I report $\overline{EWACR}$ and $\overline{EWMACR}$ for short- and long-run IPO performance in Tables 2 and 3, respectively.[12]

The value-weighted average first day return for a group of N IPOs is the ratio of aggregate money left on the table on the first day over aggregate gross proceeds. Let $VWAR_1$ be the value-weighted average first day return for a group of N IPOs. It follows that

$$VWAR_1 = \frac{\sum_{i=1}^{N} V_{i,1}}{\sum_{i=1}^{N} V_{i,0}} - 1 = \frac{\sum_{i=1}^{N} V_{i,1} - \sum_{i=1}^{N} V_{i,0}}{\sum_{i=1}^{N} V_{i,0}} = \frac{\sum_{i=1}^{N} M_{i,1}}{\sum_{i=1}^{N} V_{i,0}}\,, \tag{5}$$

[12] There is a double counting problem in calculating market-adjusted averages because IPO i itself can be a component of the market. This bias is more pronounced when the overall market capitalization is small.

where $V_{i,1}$ is the market capitalization of IPO *i* at the end of first trading day, $V_{i,0}$ is the gross proceeds of IPO *i*, and $M_{i,1}$ is the money left on the table from IPO *i*. It follows that the numerator in (5) is the aggregate money left on the table and the denominator is the aggregate gross proceeds. I report the value-weighted average initial returns in Table 1 under the "Ratio" column.

To formally test whether the short- and long-run IPO returns are stationary across different time frames, stock market cycles, industries, firm age, offer price, and offer size, I adopt a pair-wised t-test with the assumption of unequal variances. The null hypothesis is that the mean returns from two samples are equal and the alternative is that they are unequal. I perform a two-tailed test across all different categories and report the results in Table 4.[13]

Ritter and Welch (2002) point out that it is unlikely to explain severe IPO underpricing with simple explanations of market mispricing or asset-pricing risk premia. Other theories to explain IPO underpricing include asymmetric information and share allocation. Asymmetric information asserts that when insiders have superior information about an IPO, investors face a market with lemons. To distinguish high quality issuers from the pool of low quality issuers, high quality issuers may signal to the market by deliberately selling their shares below the fair prices. They can recoup the sacrifice later either in the form of seasoned offerings (Welch, 1989), favorable market response to dividend announcements (Allen and Faulhaber, 1989), or favorable analyst coverage

[13] I perform the equality test on average initial returns and average three-year cumulative returns and only report the results for average initial returns since the results for average three-year cumulative returns are very similar.

(Chemmanur, 1993). To proxy for IPO quality, I use firm age defined as the number of years a firm has been in business before it goes public to capture asymmetric information. Firms in business longer before going public represent quality issuers that should signal to the market by underpricing their new shares.

Share allocation concentrates on the demand and supply framework of IPO issues. In the case of rationing on "hot issues", Beatty and Ritter (1986) find that the demand for these issues can far exceed supply by a factor of as much as 20, causing severe initial IPO underpricing. Other research focuses on discrimination between underwriters and issuers (Loughran and Ritter, 2002), ownership structure (Booth and Chua, 1996, and Brennan and Franks, 1997), and demand and supply effects in trading initiation (Aggarwal, 2000, and Cornelli and Goldreich, 2001), among others. Chinese IPOs are similar to "hot issues" in the U.S. with rationing. The CSRC controls the number of new IPOs each year. On the demand side, Chinese investors have very few other investment alternatives but to bid for new issues, resulting in a strong demand for new IPO shares. Kandel, Sarig, and Wohl (1999) study the full demand schedules of 27 Israeli IPOs and find that the demand schedules are relatively flat around the auction clearing price with an average elasticity of 37, implying that any small reduction in offer price causes huge excess demand. Recent work by Lowry and Schwert (2002) finds that part of the information about the firms' eventual underpricing is incorporated into the offer price. Therefore, I include offer price in the regression model.

Fama and French (1993) first identify and later other researchers confirm that firm size is an important factor in explaining cross-sectional asset returns. Consequently, I use offer size as a proxy for firm size and include it in the regression model. I expect that

IPOs with smaller offer sizes should behave similarly to small-size firms to earn higher initial returns.

In order to examine the short- and long-run IPO pricing and test for cross-sectional differences in IPO returns, I propose a regression model as follows:

$$R_i - \overline{R} = \alpha_i + \beta_{Age}\left(\frac{A_i - \overline{A}}{\overline{A}}\right) + \beta_{\mathrm{Price}}\left(\frac{P_i - \overline{P}}{\overline{P}}\right) + \beta_{Size}\left(\frac{S_i - \overline{S}}{\overline{S}}\right) + \sum_{j=1}^{5} \gamma_j D_{i,j} + \varepsilon_i , \quad (6)$$

where R_i is the return of IPO *i*, $\overline{R}$ is the average return of all the IPOs during the time period when IPO *i* is initiated, α_i is the regression intercept, A_i is the age of firm *i* when it goes public, $\overline{A}$ is the average age of all the IPO firms when they go public during the time period when IPO *i* is initiated, and β_{Age} is the age sensitivity. Consequently, $R_i - \overline{R}$ can be interpreted as the net return of IPO *i* in excess of its corresponding average within the same time period and $\frac{A_i - \overline{A}}{\overline{A}}$ is the percentage change of the age of firm *i* with respect to the average age of all the firms going public in the same time period. Analogously, P_i and S_i are the offer price and offer size for IPO *i*, $\overline{P}$ and $\overline{S}$ are the average offer price and offer size of all the IPO firms within the same time period, $\frac{P_i - \overline{P}}{\overline{P}}$ and $\frac{S_i - \overline{S}}{\overline{S}}$ are the percentage changes of the offer price and offer size of IPO *i* with respect to their corresponding averages within the same time period, and β_{Price} and β_{Size} are the sensitivities of offer price and offer size, respectively. The dummy variable $D_{i,j}$ captures possible differences in returns from six industries; it is one if IPO *i* belongs to industry *j* and is zero otherwise, and γ_j is the coefficient of the dummy with *j* = 1 (finance), 2 (utility), 3 (property), 4 (conglomerate), and 5 (industrial).

I repeat regression (6) under several scenarios. I run the regression with the entire sample, two sub-samples according to IPO timing, and in each year to test if the IPO pricing is stationary over time.[14] I repeat the regression in rising and declining stock markets to examine if the IPO pricing is sensitive to stock market cycles. I even run the regression within each industry to test if the model explains cross-sectional short- and long-run IPO pricing within each industry.[15] I provide the regression results for short- and long-run IPO returns in Tables 5 and 6 separately.

IPO market cycles have been recognized in financial literature for quite a while. Ibbotson and Jaffe (1975), Ibbotson, Sindelar, and Ritter (1988, 1994), and Lowry and Schwert (2002) all report pronounced cycles in the number of new issues per month and average initial returns. Current evidence indicates that higher initial returns lead to more IPOs in subsequent months in the U.S. IPO market. However, no research has focused on the young Chinese IPO market. With a large data set, I am able to calculate the number of IPOs each month and average initial returns per month over the period 1991 to 2001 and plot these two series in Figure 3. I further examine the cross correlation and lead-lag relationship between them using $\pm$ 12 month lags. I provide the results in Figure 4.

[14] I exclude 1991 because of insufficient data (only 6 IPOs).

[15] Ritter (1984) provides evidence that underpricing is sometimes focused on certain industries. To test if the model is valid across industries, I run regression (6) without the dummies across each industry for the short- and long-run, respectively, except the finance group because of insufficient observations. Even though I don't report these results to save space, I find that the results are consistent with those obtained in Tables 5 and 6 and are supportive of the regression model.

5. Empirical Results

In this section, I first report the short-run performance of 1,130 Chinese A share IPOs, including value-weighted average initial returns and equally-weighted average cumulative returns over 1, 5, 20, and 120 days with and without the market adjustment across different time, stock market cycle, industry, firm age, offer price, and offer size.[16] Then, I present the corresponding results for the long-run, which includes one-, two-, and three-year average returns with and without the market adjustment. Next, I present evidence that Chinese IPO activity and pricing are not stationary across different categories using the equality test results. After that, I provide regression results to show that the model explains cross-sectional short- and long-run IPO returns. Finally, I offer descriptive evidence to demonstrate that there exist pronounced IPO market cycles in China; monthly IPO volume and average initial returns are highly correlated with initial returns leading IPO volume by 6-9 months.

5.1. Short-run Performance

The last column (Ratio) in Table 1 presents value-weighted average initial returns of 1,130 Chinese A share IPOs over the period 1991 to 2001 by time, stock market cycle, industry, firm age, offer price, and offer size. From that column, I find that initial returns are huge and fluctuate dramatically. In general, initial returns are higher before 1996 (except 1994) and decline over time. The highest return of 294.48% is realized in 1993 while the lowest return of 81.95% occurs in 2001, the most recent year in the sample.

[16] Hereafter, I refer to equally-weighted average cumulative return as average return and equally-weighted market-adjusted average cumulative return as market-adjusted average return.

During the first sub-period between 1991 and 1995, the average initial return reaches 215.72%, almost doubling the average of 109.75% in the second sub-period from 1996 to 2001. The average for the entire sample is 122.56%. During rising stock markets, the value-weighted average initial return is 119.03%, which is about 12% lower than the average initial return of 131.18% during declining stock markets. Across industries, the commerce group enjoys the highest value-weighted average initial return of 201.02%, followed by the property group with 182.42%. The industrial group earns the lowest value-weighted average initial return of 105.65%.

Upon examining value-weighted average initial returns across firm age, I find that, in general, the older a firm is when it goes public, the higher the initial return it earns. In particular, firms with 8 or more years of experience in business (the highest age group) earn an average initial return of 202.65%, more than doubling the average return of 97.94% for firms with only one to two years of business experience before going public. Across offer price, I find an expected pattern: the lower the offer price, the higher the average initial return. However, this relationship is not strictly monotonic. For instance, the lowest offer-price group with an offer price of 1.00 Yuan receives the highest average initial return of 1,406.10%, followed by a 345.42% average initial return for offer prices between 1.01 and 3.00 Yuan, the second lowest offer-price group. The average initial return drops to 96.70% for the next group with offer prices between 3.01 to 5.00 Yuan before it rises to 111.86% and 127.19% respectively for offer prices between 5.01 and 7.00 Yuan and 7.01 to 10.00 Yuan. Finally, the average initial return drops to the lowest level of 94.96% for the highest offer-price group with prices greater than 10.00 Yuan. Across offer size, I find a clearer picture: the smaller the offer size, the

higher the average initial return. This time, the relationship is monotonic: the smallest 20% of IPOs in offer size earn the highest average initial return of 546.94% while the largest 20% of IPOs only receive an 85.26% average initial return. The difference is more than 460%, an indication of a strong small offer-size effect in initial IPO pricing.

Table 2 reports short-run IPO performance, which includes average returns over 1, 5, 20, and 120 days across different categories with and without the market adjustment. I find that the average initial returns fluctuate even more than do value-weighted initial returns. The highest average first day return of 609.40% occurs in 1995 during which there are only 24 IPOs, suggesting possible excess demand for limited supply in 1995. The lowest average first day return of 113.46% is realized in 1999 with 98 IPOs, which is close to the average annual volume of IPOs over the entire sample period. During the first sub-period from 1991 to 1995, the average initial return reaches 380.43% but drops by about 4% to 376.39% after 120 trading days. Over the second sub-period from 1996 to 2001, the average initial return is 230.59% but increases by about 13% to 243.13% after 120 trading days. The overall average initial return for the entire sample is 268.99% and the 5-, 20-, and 120-day average returns are 268.24%, 268.52%, and 277.29%. The 1-, 5-, and 20-day market-adjusted average returns are 268.98%, 267.98%, and 268.14% over the entire sample period, slightly lower than the corresponding average returns without the market adjustment. The 120-day market-adjusted average return is 273.23%, which is about 4% lower than the 120-day average return without the market adjustment.

It is expected that there are more IPOs during rising stock markets than in declining stock markets. However, it is surprising to find that the average initial return during declining stock markets is significantly higher than that during rising stock

markets. The average initial return during rising stock markets is 235.48% compared to 330.05% during declining stock markets. A possible explanation is addressed by the demand and supply framework. During rising stock markets, investors have more investment alternatives (or substitutes) that reduce the demand for new IPOs shares. In declining stock markets, investors focus more on new issues, causing higher demand for new IPO shares. As a result, the average initial return is higher.

Also from Table 2, I find that the average initial returns across industries vary, with the property group leading the way with a 468.14% average return, followed by the commerce group with 326.24%. The industrial group with the most IPOs in all six industries earns the least average initial return of 249.68%. The 5- and 20-day average returns are not significantly different from the average initial returns for each industry, while the 120-day average returns are mostly higher except the finance group. The market-adjusted average returns behave in a similar way. All groups show an increase in 120-day market-adjusted average returns from their average initial returns.

Across the firm age category in Table 2, I find evidence to support a significantly positive relationship between firm age and average initial returns. In particular, firms in business for 8 or more years before going public receive an average initial return of 828.62%, compared to an average initial return of 199.54% for firms with less than one year of experience before going public. If firm age serves as a proxy for IPO quality, this evidence is consistent with the asymmetric information hypothesis; firms in business longer before going public represent high quality firms and high quality firms would like to distinguish themselves from other average or below-average firms by signaling to the market through underpricing their IPOs.

Again from Table 2, I find a strong but negative relationship between offer price and average initial returns. Specifically, the lowest offer-price group enjoys the highest average initial return of 1,465.97%, followed by 602.00% from the second lowest offer-price group. The group with the highest offer prices earns the least average initial return of 125.10%, less than one tenth of the return earned by the lowest offer-price group, strong evidence that offer price affects initial IPO pricing. If we assume that offer price is a driving force to cause excess demand for new IPO shares in China, this evidence is consistent with such a hypothesis.

Lastly, by examining the offer size category in Table 2, I find the third significant relationship: the smaller the offer size, the higher the average initial return. For the smallest quintile of IPOs in offer size, the average initial return is as high as 785.83%. The average initial return decreases strictly as the offer size increases. For the largest quintile, the average initial return drops to 103.19%. If offer size is a good proxy for firm size, which has been identified for a long time as an important factor that systematically influences asset returns, the evidence suggests that offer size is an important determinant in pricing IPOs.

5.2 Long-run Performance

The results from Table 3 indicate that the long-run performance for 1,130 Chinese A share IPOs also varies significantly across different categories. The one-year average return reaches 640.45% for IPOs initiated in 1991, representing an increase of more than 150% from their average initial return of 489.18%. The difference between the one-year average return and the average initial return for IPOs issued in 1992 is around 121%. In 9

out of 11 years under investigation, the one-year average returns are higher than the average initial returns, with the two exceptions occurring in 1993 and 2001. The worst case occurs to IPOs initiated in 2001, which gives back about 90% from the average initial return over the course of the year, presumably caused by a sharp decline in the overall stock market which started in 2001. Over two sub-periods from 1991 to 1995 and from 1996 to 2001, the average one-year returns are about 11% and 17% higher than their corresponding average initial returns. Over stock market cycles, the difference is around 24% during rising markets and only about 2% during declining markets. For the entire sample period, the difference is close to 16%.

The average two- and three-year returns behave similarly as the average one-year returns. IPOs initiated in 1991 perform the best after issuance. The average return rises to 686.79% after two years from the initial offering, before it drops to 644.31% in year three. The bad performance for IPOs issued in 2001 gets even worse; the two- and three-year average returns drop to 36.65% and 5.63% respectively, giving back almost all the gains from its initial offerings after three years.

The long-run market-adjusted average returns exhibit analogous patterns. The one-, two- and three-year market-adjusted average returns are mostly higher than the corresponding average initial returns, except the one-year return in 1995, the two- and three-year returns in 2000, and the one-, two-, and three-year returns in 2001, most of which are caused by declining stock markets since 2001. Over two sub-periods according to IPO timing, the long-run market-adjusted returns exceed the corresponding initial returns except the three-year case in the second sub-period, presumably caused by the decline in stock markets again. For the entire sample period, the market-adjusted returns

exceed the average initial return by 4.27%, 8.46%, and 5.92% respectively over a one-, two-, and three-year period. Hence, even if an investor missed all of the IPOs' initial returns but bought the shares at the first day closing prices and held these shares for one, two, and three years, the market-adjusted average returns would be still positive. Since all the long-run market-adjusted average returns are positive in Table 3, Chinese IPOs outperform the market in the long-run.

Examining the long-run performance across industries reveals a similar picture. All one-year average returns are higher than the corresponding average initial returns except the property group. The finance group suffers a decline in average two-year return before rebounds in year three. The average two-year return for conglomerate group is slightly below its one-year average return. The market-adjusted long-run performance for all industries mimics the long-run average returns without the market adjustment except that, in general, the market-adjusted average returns decrease as investors hold IPOs longer, indicating overall rising stock markets in the long-run.

Across firm-age groups I find that four out of six groups enjoy an increase in one-year average returns from their initial returns. The exceptions are the second lowest age group and the highest age group. However, one relationship is obvious: the higher a firm age is, the higher the long-run average return it earns. This evidence suggests that firm age also affects long-run IPO performance. The market-adjusted returns across firm-age groups follow a similar pattern. Generally, they are lower than the corresponding average returns, resulting from advancing stock markets in the long-run.

For the offer-price and offer-size groups I find strong support that offer price and offer size affect long-run IPO returns. The group with the lowest offer price of 1.00 Yuan

retains the highest average return while the group with the highest offer price of more than 10.00 Yuan stays with the lowest average return in the long-run. All price groups earn higher average returns after one year from their initial returns except the second lowest offer-price group, whose one-year average return drops by about 15%. Small offer-size groups clearly outperform large offer-size groups in the long-run. Moreover, the average returns for smaller offer-size groups rise over time while the average returns for larger offer-size groups decline over time. The market-adjusted returns for different offer-price and offer- size groups reveal a similar story. The evidence demonstrates that offer price and offer size are highly correlated with long-run IPO performance. Therefore, offer price and offer size are also determinants in pricing IPOs in the long-run.

5.3. Equality Test

Table 4 provides the test results of equality in average initial returns across different categories. By comparing t-values over time, I find that the average initial return in 1995 is higher than the corresponding returns for all other years and is significantly higher than the average initial returns for every year after 1993. Similarly, initial returns from 1991 to 1993 are significantly higher than most initial returns after 1995.[17] The average initial return in 1998 is significantly higher than those from 1999 to 2001. Looking at t-values over the entire sample, two sub-periods, and stock market cycles, I find that the average initial return is significantly higher during the first sub-period than in the entire sample, during the second sub-period, and during rising stock markets. It is

[17] The average initial return in 1991 is higher than those in 1996, 1997, and 1998. However, small sample size (only 6 IPOs) and high variance in 1991 cause the t-values to be insignificant.

also higher than the average initial return during declining stock markets, but the difference is not statistically significant. The average initial return during declining stock markets is significantly higher than those in the second sub-period, over the entire sample, and during rising stock markets. The average initial return over the entire sample period is significantly higher than the average initial return in the second sub-period and marginally higher than that during rising stock markets.

Examining the test results across industries in Table 4, I find that with the exception of the property group, which earns a marginally higher initial return than the conglomerate and industrial groups, initial returns across other industries don't seem statistically different. This weak result either suggests that the system of industrial classification in China is too rough to distinguish the main characteristics of each industry or the variance of initial returns within each industry is too high. A related explanation can be the sample size. For example, there are only 6 IPOs in the finance group and 36 in the property group. Small sample size usually leads to higher variance, causing insignificant t-values.

Across other categories, I find that average initial returns are very different within firm-age groups, offer-price groups, and offer-size groups because most t-values are statistically significant. Firms with higher ages earn significantly higher initial returns compared to firms with lower ages. Firms with lower offer prices enjoy higher initial returns in contrast to firms with higher offer prices. Firms with smaller offer sizes receive higher initial returns than firms with larger offer sizes. These results further support the proposed regression model with three factors which will be discussed in the next section.

5.4. Cross-sectional Regression Results

Examining regression results year by year in Table 5, I find that the intercepts are generally not statistically different from zero except in 1999.[18] In general, the regression coefficients (sensitivities) associated with firm age, offer price, and offer size are statistically different from zero and they are consistent with expectations in signs. Higher firm age, lower offer price, and smaller offer size all lead to higher initial returns. However, the impact of firm age on initial returns seems weakening in recent years within the sample, indicated by insignificant t-values associated with the age sensitivity from 1999 to 2001. The adjusted R-squares range from 0.16 in 2000 to 0.57 in 1992. The coefficients associated with the dummy variables change in magnitudes and even signs year by year, indicating that the IPO performance is not stationary for each industry over time even though most of them are not statistically significant.

Over the two sub-periods according to IPO timing, I find more consistent results that show a significantly positive impact of firm age and negative impacts of offer price and offer size on initial IPO returns, evidenced by significant sensitivities with firm age, offer price and offer size. The fitness of the model increases in the second sub-period compared to the first sub-period, as evidenced by an increase in the adjusted R-squared from 0.09 to 0.25. All the coefficients associated with the dummies are not statistically significant.

The regression results over the entire sample further confirm the importance of the factors identified in pricing initial IPO returns. Specifically, the estimated sensitivity

[18] Further examining the regression result I find that the intercept captures the missing effect from firm age and offer price in 1999.

of firm age is 0.82 with a t-value of 7.89, suggesting that if an IPO firm's age is 1% higher than the average age of all the IPO firms in the entire sample, the firm will earn an additional 0.82% in initial return. The estimated sensitivity of offer price is -0.85 with a t-value of -6.78, indicating that if the offer price of an IPO is 1% lower than the average of all the offer prices in the entire sample, the IPO's initial return will be 0.85% higher. The estimated sensitivity of offer size is -0.40 with a t-value of -5.47, implying that if the offer size of an IPO is 1% smaller than the average offer size for all the IPOs in the entire sample the IPO will earn an additional 0.40% in initial return. The adjusted R-squared over the entire sample is 0.13.

Over stock market cycles, I find similar results. All the factors have a significant impact on cross-sectional initial returns. Moreover, the magnitude of sensitivities changes over cycles. During rising stock markets, initial returns are more sensitive to offer price and offer size, as evidenced by larger estimated sensitivities associated with those two factors. This result suggests that during rising stock markets, Chinese investors prefer IPOs with lower offer prices and smaller offer sizes. During declining stock markets, however, Chinese investors prefer quality IPOs. As a result, IPO initial returns are more sensitive to firm age which serves as a proxy for IPO quality. All coefficients associated with dummy variables are not significant except the one with the property dummy during rising stock markets, suggesting that the property group earns a significantly higher initial return during rising stock markets. The adjusted R-squares are 0.17 and 0.11 respectively.

Table 6 reports the regression results for three-year average returns in excess of their corresponding long-run averages and the results support the model in the long-run. Examining year-by-year results, I find that most of the time the regression coefficients

associated with the factors are statistically significant and the signs are consistent with expectations, even though the impact of firm age on the long-run IPO performance has weakened since 1999. The adjusted R-squares range from 0.19 in 2000 and 2001 to 0.71 in 1992, suggesting the model explains long-run IPO returns. Over two-sub periods according to IPO timing, I find that long-run returns are more sensitive to offer price during the second sub-period, which suggests that IPOs with smaller offer prices earn higher long-run returns, an indication of excess demand for IPOs with lower offer prices in the most recent years within the sample period.

Over the entire sample period, I find comparable sensitivities for firm age, offer price, and offer size to those found in the short-run. Specifically, the long-run sensitivity associated with firm age is 0.73, slightly lower than 0.82 for the short-run. The sensitivity associated with offer price remains close at -0.84. The sensitivity associated with offer size is a bit stronger at -0.53, compared to -0.40 in the short-run. The evidence seems to suggest that offer size is getting more important in the long-run in contrast to firm age. The adjusted R-squares are similar for the short- and long-run. Over stock market cycles, I find that the estimated sensitivities for the long-run are similar to those for the short-run. The adjusted R-squares are almost identical.

5.5. IPO Market Cycles

Figure 3 plots monthly IPO volume and average initial returns for 1,130 Chinese A share IPOs over the period 1991 to 2001. It appears that periods of high initial returns tend to be followed by spurts of IPO volume, which in turn is followed by periods of lower initial returns. For instance, there were 7 and 12 IPOs with average initial returns

of 1,315% and 1,045% in April and May 1993. The number of IPOs in November 1993 and January 1994 was 22 and 31 respectively, which is the first spurt seen in Figure 1. Following that, there were only 2 IPOs in each of June and July 1994, with average initial returns of 40% and -3%, respectively. The cross correlation between monthly IPO volume and average initial returns is plotted in Figure 4, using $\pm$ 12 month lags. The plot clearly indicates that there exists a strong correlation between the two series. Looking forward, the highest correlation occurs at the 7 and 8 month lags, with a correlation of 0.30 each. In general, the correlation is strong at the 6-9 month lags. Looking backward, I find that the two series are highly and negatively correlated with the correlation reaching -0.20 at the -10 month lag, followed by -0.19 at the -12 month lag. Combining Figures 3 and 4 it suggests that high initial returns lead IPO volume by 6-9 months in the Chinese IPO market. Following spurts in IPO volume, there are periods with lower initial returns, often occurring 10 to 12 months after volume spurts. These results are consistent with the findings in Ibbotson, Sindelar, and Ritter (1994), and Lowry and Schwert (2002).

The observation that more companies tend to file IPOs following periods of high initial returns seems to suggest that the initial returns of recent IPOs contain information about the future IPO valuation on the market. However, Lowry and Schwert (2002) find that it is the information learned during the registration period that is positively related to future IPO volume and part of the information is incorporated into offer price. The results obtained in this paper are consistent with their findings since in addition to offer price, firm age and offer size are information investors learn during the registration period, all of which affect IPO pricing and consequently IPO volume.

6. Conclusions

This paper examines Chinese A share IPO activity, pricing, and market cycles with an enlarged data set, which offers a unique opportunity to investigate the short- and long-run IPO performance across different time frames, stock market cycles, industries, firm ages, offer prices, and offer sizes. Consistent with findings in the U.S. IPO market, I find that many Chinese IPO phenomena are not stationary. Most of the time, the short- and long-run average returns are significantly different across different categories. Chinese IPOs exhibit severe short-run underpricing and long-run outperforming. To explain the pricing behavior in the Chinese IPO market, I propose a regression model that includes firm age to proxy for IPO quality, offer price to capture excess demand for new IPO shares, and offer size to catch firm size and find that the model explains cross-sectional short- and long-run IPO returns. The estimated short-run sensitivities for firm age, offer price, and offer size are 0.82, -0.85, and -0.40 respectively over the entire sample. In addition, I find evidence that monthly Chinese IPO volume and average initial returns are highly correlated. The cross correlation is as high as 0.3 with average initial returns leading IPO volume by 6-9 months. The cross correlation is around -0.20 at -10 month and -12 month lags, suggesting that after spurts in IPO volume, there are periods with lower initial returns, often occurring 10-12 months after IPO volume spurts.

Understanding Chinese IPO activity, pricing, and market cycles helps investors make better investment decisions, especially when the global financial markets are getting more integrated. Investors can include Chinese IPOs in their portfolios to improve portfolio performance in both the short- and long-run. As Harvey (1995) suggests, the inclusion of international equity in domestic portfolios actually reduces a portfolio's total

risk. Thus, Chinese IPOs provide an additional investment opportunity for international investors to enhance their portfolio returns and/or to reduce their portfolio risk.

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Table 1
Summary Statistics of Chinese A Share IPOs, 1991 to 2001

The table reports the number of IPOs (IPO #), average offer price (Price in Yuan) and shares (Shares in millions), aggregate gross proceeds (Proceeds in millions of Yuan), size per deal (Size in millions of Yuan), and aggregate money left on the table (Money in millions of Yuan) by time, stock market cycles (Rising or Declining), industry, firm age (in years), offer price (in Yuan), and offer size (in millions of Yuan) for 1,130 Chinese A share IPOs over the period 1991 to 2001. The column "Ratio" is the aggregate money left on the table divided by aggregate gross proceeds, which can be interpreted as the value-weighted initial returns in percentages.

Category	IPO #	Price	Shares	Proceeds	Size	Money	Ratio (%)
1991	6	3.26	22.67	393	65.50	976	248.35
1992	39	26.37	11.65	3,115	79.87	8,556	274.67
1993	124	3.85	45.08	21,499	173.38	63,311	294.48
1994	110	4.65	33.80	15,807	143.70	15,329	96.98
1995	24	3.31	34.91	2,507	104.46	5,282	210.69
1996	203	5.13	22.75	22,448	110.58	33,803	150.58
1997	205	5.89	49.76	61,764	301.29	82,566	133.68
1998	105	5.12	58.25	33,777	321.68	33,686	99.73
1999	98	6.20	85.98	50,325	513.52	46,579	92.56
2000	137	8.25	83.93	85,161	621.61	98,671	115.86
2001	79	9.33	107.06	61,547	779.07	50,439	81.95
1991 – 1995	303	6.98	35.43	43,322	142.98	93,454	215.72
1996 – 2001	827	6.36	59.64	315,022	380.92	345,744	109.75
1991 – 2001	1,130	6.53	53.15	358,344	317.12	439,198	122.56
Rising Market	733	6.71	54.88	254,157	346.73	302,521	119.03
Declining Market	397	6.19	49.94	104,187	262.43	136,677	131.18
Finance	6	5.18	153.67	8,493	1,415.50	11,192	131.78
Utility	82	5.94	73.62	33,061	403.18	43,226	130.75
Property	36	6.53	33.88	6,742	187.27	12,299	182.42
Conglomerate	211	7.07	43.29	67,617	320.46	100,162	148.13
Industrial	692	6.62	57.16	225,451	325.79	238,186	105.65
Commerce	103	5.40	30.91	16,980	164.85	34,133	201.02
Age<1	449	7.19	59.05	142,451	317.26	181,060	127.10
$1 \le$ Age<2	189	6.84	73.25	90,180	477.14	88,323	97.94
$2 \le$ Age<4	243	6.32	34.86	52,995	218.08	66,578	125.63
$4 \le$ Age<6	116	5.65	45.84	33,426	288.15	45,346	135.66
$6 \le$ Age<8	87	5.93	51.24	32,543	374.05	44,216	135.86
$8 \le$ Age	46	3.37	31.55	6,748	146.69	13,675	202.65
P=1.00	85	1.00	20.64	1,754	20.63	24,663	1,406.10
1.00<P $\le$ 3.00	75	2.24	52.49	9,623	128.30	33,240	345.42
3.00<P $\le$ 5.00	292	4.20	67.37	82,431	282.30	79,709	96.70
5.00<P $\le$ 7.00	386	6.01	51.02	118,252	307.15	132,274	111.86
7.00<P $\le$ 10.00	205	8.30	55.40	94,337	460.18	119,983	127.19
P>10.00	87	21.61	41.83	51,947	597.09	49,329	94.96
Size<70	226	4.37	14.87	7,896	34.94	43,186	546.94
70 $\le$ Size<138	226	6.90	22.05	23,100	102.21	41,992	181.78
138 $\le$ Size<251	226	6.23	35.37	43,421	192.13	64,288	148.06
251 $\le$ Size<438	226	6.58	55.37	76,018	336.36	112,465	147.95
Size> 438	226	8.56	138.23	207,909	919.95	177,267	85.26

Table 2
Short-run Performance of Chinese A Share IPOs, 1991 to 2001

The table reports the short-run performance of 1,130 Chinese A share IPOs over the period 1991 to 2001 (with the return data extended to 2004), including equally-weighted 1-, 5-, 20-, and 180-day average cumulative returns with and without the market adjustment ($\overline{EWACR}$ and $\overline{EWMACR}$), by time, stock market cycles, industry, firm age, offer price, and offer size. Returns of IPOs initiated at the Shanghai Stock Exchange or Shenzhen Stock Exchange are adjusted by returns of the A share index on the Shanghai Stock Exchange (started in January 1992) or the Shenzhen Stock Exchange (started in October 1992), respectively. All returns are measured in percentages.

Category	$\overline{EWACR}$				$\overline{EWMACR}$			
	1-day	5-day	20-day	120-day	1-day	5-day	20-day	120-day
1991	489.18	477.97	477.07	585.97	N/A	N/A	N/A	N/A
1992	420.37	420.02	472.01	534.90	419.23	419.17	463.86	455.53
1993	517.94	516.35	514.66	493.06	517.84	516.46	517.37	520.69
1994	165.66	163.93	156.87	153.40	165.49	164.17	163.64	168.19
1995	609.40	605.17	598.37	617.38	610.27	605.62	601.73	601.87
1996	299.70	299.96	301.81	339.18	299.39	297.95	295.48	311.32
1997	266.99	265.54	263.36	268.52	267.38	266.32	264.37	269.60
1998	285.10	285.10	284.45	284.43	285.43	285.50	285.28	288.00
1999	113.46	113.07	113.84	134.80	113.22	112.57	111.63	116.38
2000	150.82	150.88	152.93	163.70	150.72	150.02	150.47	155.98
2001	169.71	168.96	166.96	147.70	169.83	169.60	169.22	158.75
1991 – 1995	380.43	378.68	379.57	376.39	380.29	378.78	382.88	385.30
1996 – 2001	230.59	230.18	230.25	243.13	230.62	229.79	228.60	234.61
1991 – 2001	268.99	268.24	268.52	277.29	268.98	267.98	268.14	273.23
Rising Market	235.48	235.84	238.92	253.81	235.29	234.36	235.02	242.01
Declining Market	330.05	327.28	322.46	320.07	330.37	329.23	338.50	330.12
Finance	283.62	281.65	289.96	258.91	283.62	282.20	292.37	297.37
Utility	307.32	307.21	307.18	322.59	307.80	307.35	308.06	319.70
Property	468.14	470.06	474.75	480.53	467.96	470.16	475.12	479.89
Conglomerate	256.12	256.36	255.64	264.28	255.85	256.13	255.71	261.50
Industrial	249.68	248.60	249.34	257.54	249.72	248.37	248.59	251.77
Commerce	326.24	324.39	322.07	332.49	326.06	323.37	321.84	333.16
Age<1	199.54	199.01	199.88	207.77	199.44	198.69	200.06	204.92
$1 \le$ Age<2	251.16	251.14	250.34	251.82	251.35	251.26	251.66	258.59
$2 \le$ Age<4	221.80	221.24	223.05	241.63	221.74	220.62	219.43	227.55
$4 \le$ Age<6	313.19	309.58	308.67	313.37	313.51	309.92	309.66	314.16
$6 \le$ Age<8	447.61	447.08	446.31	459.22	447.41	445.99	444.99	450.09
$8 \le$ Age	828.62	828.71	824.68	823.22	828.43	829.22	827.08	811.74
P=1.00	1465.97	1461.20	1458.43	1467.18	1465.80	1461.62	1460.38	1461.77
1.00<P $\le$ 3.00	602.00	600.43	600.14	582.85	602.36	600.70	602.28	594.20
3.00<P $\le$ 5.00	159.96	159.18	156.70	161.31	159.86	158.91	157.32	161.11
5.00<P $\le$ 7.00	132.04	132.05	131.52	143.05	132.03	131.34	130.08	137.82
7.00<P $\le$ 10.00	147.21	146.78	147.00	161.00	147.21	146.77	146.37	156.24
P>10.00	125.10	124.79	141.41	160.25	125.20	124.85	138.81	139.17
Size<70	785.83	783.60	787.51	798.63	786.08	783.87	789.00	791.03
$70 \le$ Size<138	185.24	183.72	182.15	192.38	184.78	182.92	181.67	189.69
$138 \le$ Size<251	148.60	148.58	150.36	162.93	148.50	147.81	148.04	158.16
$251 \le$ Size<438	146.99	147.02	145.21	151.81	147.00	147.04	145.35	147.86
Size> 438	103.19	103.10	102.37	105.84	103.43	103.08	101.72	104.41

Table 3
Long-run Performance of Chinese A Share IPOs, 1991 to 2001

The table reports the long-run performance of 1,130 Chinese A share IPOs over the period 1991 to 2001 (with the return data extended to 2004), including equally-weighted one-, two-, and three-year average cumulative returns with and without the market adjustment ($\overline{EWACR}$ and $\overline{EWMACR}$), by time, stock market cycles, industry, firm age, offer price, and offer size. Returns of IPOs initiated at the Shanghai Stock Exchange or Shenzhen Stock Exchange are adjusted by returns of the A share index on the Shanghai Stock Exchange (started in January 1992) or the Shenzhen Stock Exchange (started in October 1992), respectively. All returns are measured in percentages.

Category	$\overline{EWACR}$			$\overline{EWMACR}$		
	One-year	Two-year	Three-year	One-year	Two-year	Three-year
1991	640.45	686.79	644.31	N/A	N/A	N/A
1992	541.20	529.12	559.83	467.38	479.70	483.48
1993	501.68	525.38	571.02	528.59	539.33	546.55
1994	177.41	200.81	285.22	175.45	183.11	192.80
1995	639.88	705.64	761.94	597.17	619.95	658.83
1996	356.50	384.90	401.13	313.69	328.55	317.14
1997	285.74	297.89	340.81	274.89	281.62	285.78
1998	296.27	343.02	355.46	291.64	299.27	306.89
1999	154.74	166.33	138.26	117.91	127.87	120.82
2000	157.49	129.40	112.00	159.09	149.32	136.81
2001	79.09	36.65	5.63	102.10	61.22	26.32
1991 – 1995	391.90	415.64	475.73	392.27	402.98	413.50
1996 – 2001	247.94	263.76	363.55	232.25	241.43	227.15
1991 – 2001	284.83	297.30	317.93	273.26	277.45	274.91
Rising Market	259.17	278.94	275.94	241.02	252.21	237.70
Declining Market	331.60	345.96	394.45	332.01	338.64	342.71
Finance	292.77	279.38	347.07	299.60	294.25	294.81
Utility	337.68	349.02	372.50	328.05	330.12	325.28
Property	454.70	462.78	480.36	454.40	442.72	437.48
Conglomerate	268.17	267.57	277.39	261.42	257.49	249.92
Industrial	265.05	280.95	301.95	251.22	258.22	256.90
Commerce	351.30	370.65	406.79	338.99	348.08	349.93
Age<1	222.98	244.25	273.46	210.17	217.97	220.29
1 ≤ Age<2	247.94	239.58	255.28	253.46	245.33	240.20
2 ≤ Age<4	246.21	258.42	275.22	223.44	226.74	218.75
4 ≤ Age<6	327.28	346.21	362.00	317.16	326.76	321.67
6 ≤ Age<8	458.71	535.15	465.00	477.13	526.25	450.15
8 ≤ Age	818.13	827.52	858.19	801.94	803.25	806.83
P=1.00	1476.03	1515.96	1548.55	1461.26	1482.57	1492.57
1.00<P ≤ 3.00	586.96	605.35	647.42	589.83	593.61	596.13
3.00<P ≤ 5.00	173.82	199.91	229.64	163.77	175.41	176.41
5.00<P ≤ 7.00	156.00	168.25	187.04	140.18	143.63	139.86
7.00<P ≤ 10.00	159.51	150.52	157.17	151.93	144.38	135.66
P>10.00	149.70	137.20	139.93	134.19	128.49	118.03
Size<70	805.98	840.05	870.19	791.42	806.64	809.77
70 ≤ Size<138	210.48	235.17	280.87	195.32	209.52	208.87
138 ≤ Size<251	175.79	190.40	215.97	158.59	163.41	161.41
251 ≤ Size<438	154.85	153.90	157.54	145.69	140.77	134.92
Size> 438	102.45	94.13	92.86	100.40	92.82	85.80

Table 4
Equality Test of First Day Average Returns of Chinese IPOs, 1991 to 2001

The table reports t-values for the equality test of average initial returns for 1,130 Chinese A share IPOs over the period 1991 to 2001 by time, stock market cycles, industry, firm age, offer price, and offer size. The null hypothesis is that average initial returns from two samples are the same. Pair wised and two-tailed tests are performed, assuming unequal variances. [a], [b], and [c] denote significance at the one, five, and ten percent levels.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1991	0.41	- 0.20	2.44 [c]	- 0.63	1.41	1.64	1.43	2.86 [b]	2.58 [c]	2.40 [c]
1992		- 0.81	2.34 [b]	- 1.08	1.08	1.36	1.12	2.86 [a]	2.52 [b]	2.28 [b]
1993			6.10 [a]	- 0.61	3.47 [a]	3.90 [a]	2.99 [a]	7.38 [a]	6.76 [a]	5.86 [a]
1994				- 3.16 [a]	- 3.46 [a]	- 2.47 [b]	- 1.99 [b]	2.22 [b]	0.66	- 0.12
1995					2.17 [b]	2.39 [b]	2.16 [b]	3.56 [a]	3.29 [a]	3.11 [a]
1996						0.68	0.22	5.45 [a]	4.46 [a]	3.16 [a]
1997							- 0.27	4.18 [a]	3.23 [a]	2.24 [b]
1998								3.00 [a]	2.37 [b]	1.87 [c]
1999									- 2.93 [a]	- 2.06 [b]
2000										- 0.71

Time	1996 – 2001	1991 – 2001	Rising Market	Declining Market
1991 – 1995	4.45 [a]	3.32 [a]	4.22 [a]	1.26
1996 – 2001		- 1.96 [b]	- 0.23	- 3.39 [a]
1991 – 2001			1.66 [c]	- 2.11 [b]
Rising Market				- 3.18 [a]

Industry	Utility	Property	Conglomerate	Industrial	Commerce
Finance	- 0.22	- 1.29	0.28	0.36	- 0.39
Utility		- 1.28	0.81	0.95	- 0.23
Property			1.87 [c]	1.95 [c]	1.15
Conglomerate				0.21	- 1.18
Industrial					- 1.35

Firm Age	$1 \le Age < 2$	$2 \le Age < 4$	$4 \le Age < 6$	$6 \le Age < 8$	$8 \le Age$
$Age < 1$	- 1.53	- 0.86	- 2.48 [b]	- 3.09 [a]	- 4.63 [a]
$1 \le Age < 2$		0.77	- 1.15	- 2.31 [b]	- 4.16 [a]
$2 \le Age < 4$			- 1.86 [c]	- 2.75 [a]	- 4.43 [a]
$4 \le Age < 6$				- 1.48	- 3.62 [a]
$6 \le Age < 8$					- 2.43 [b]

Offer Price	$1.00 < P \le 3.00$	$3.00 < P \le 5.00$	$5.00 < P \le 7.00$	$7.00 < P \le 10.00$	$P > 10.00$
P=1.00	8.08 [a]	15.19 [a]	15.54 [a]	15.28 [a]	15.54 [a]
$1.00 < P \le 3.00$		6.87 [a]	7.32 [a]	7.01 [a]	7.36 [a]
$3.00 < P \le 5.00$			3.30 [a]	1.01	2.85 [a]
$5.00 < P \le 7.00$				- 1.32	0.63
$7.00 < P \le 10.00$					1.53

Offer Size	$70 \le Size < 138$	$138 \le Size < 251$	$251 \le Size < 438$	$Size > 438$
$Size < 70$	10.78 [a]	11.53 [a]	11.63 [a]	12.43 [a]
$70 \le Size < 138$		2.56 [b]	2.98 [a]	6.45 [a]
$138 \le Size < 251$			0.15	4.26 [a]
$251 \le Size < 438$				5.12 [a]

Table 5
Cross Sectional Analysis of Short-run Performance of Chinese IPOs, 1991 to 2001

This table reports the regression results for the short-run from

$$R_i - \overline{R} = \alpha_i + \beta_{Age}\left(\frac{A_i - \overline{A}}{\overline{A}}\right) + \beta_{\Pr ice}\left(\frac{P_i - \overline{P}}{\overline{P}}\right) + \beta_{Size}\left(\frac{S_i - \overline{S}}{\overline{S}}\right) + \sum_{j=1}^{5} \gamma_j D_{i,j} + \varepsilon_i , \quad (6)$$

where R_i is the initial return of IPO *i*, $\overline{R}$ is the corresponding average of R_i in the same time period, α_i is the intercept, A_i is the age of firm *i*, $\overline{A}$ is the corresponding average of A_i in the same time period, and β_{Age} is the age sensitivity. Analogously, P_i and S_i are the offer price and offer size for IPO *i*, $\overline{P}$ and $\overline{S}$ are the corresponding average offer price and offer size of P_i and S_i in the same time period, and $\beta_{\Pr ice}$ and β_{Size} are the price and size sensitivities. The dummy $D_{i,j}$ captures the differences in six industries; it is one if IPO *i* belongs to industry *j* and is zero otherwise, and γ_j is the coefficient of the dummy with *j* = 1 (finance), 2 (utility), 3 (property), 4 (conglomerate), and 5 (industrial). N/A means that the IPOs are not available during the specified time period. $\overline{R}^2$ is the adjusted R-squired. [a], [b], and [c] denote significance at the one, five, and ten percent levels.

Time	α	β_{Age}	$\beta_{\Pr ice}$	β_{Size}	γ_1	γ_2	γ_3	γ_4	γ_5	$\overline{R}^2$
1992	0.52	0.24	- 6.53	- 1.11		0.02	4.99	- 2.65	- 1.65	
	(0.17)	(0.31)	(-4.43 [a])	(-2.09 [b])	N/A	(0.01)	(1.41)	(-0.54)	(-0.50)	0.57
1993	0.59	0.81	- 5.36	- 0.39		1.62	0.92	- 1.35	- 1.20	
	(0.43)	(2.47 [b])	(-6.09 [a])	(-1.24)	N/A	(0.80)	(0.45)	(-0.64)	(-0.80)	0.33
1994	0.48	- 0.16	- 2.90	- 0.21	0.20	- 0.69	- 0.21	0.39	- 0.95	
	(1.18)	(-1.15)	(-5.27 [a])	(-1.83 [c])	(0.17)	(-0.95)	(-0.27)	(0.60)	(-1.96 [b])	0.27
1995	- 1.16	3.13	- 2.38	- 2.05		- 2.44	- 0.56	- 7.90	3.11	
	(-0.46)	(1.44)	(-1.53)	(-1.87 [c])	N/A	(-0.44)	(-0.10)	(-1.30)	(1.07)	0.47
1996	- 0.81	0.57	- 5.35	- 1.02		0 78	1.90	- 1.24	0 70	
	(-1.14)	(2.46 [b])	(-8.54 [a])	(-2.31 [b])	N/A	(0.66)	(2.07 [b])	(-0.49)	(0.91)	0.46
1997	0.16	1.49	- 6.54	- 0.04		- 0.21		- 0.14	0.01	
	(0.17)	(5.29 [a])	(-7.79 [a])	(-0.12)	N/A	(-0.21)	N/A	(-0.12)	(0.01)	0.39
1998	- 1.69	1.11	- 5.39	- 0.13		0.63	2.29	2.57	1.68	
	(-0.74)	(4.69 [a])	(-4.41 [a])	(-0.33)	N/A	(0.22)	(0.45)	(1.01)	(0.72)	0.38
1999	1.25	0.06	0.09	- 0.46	2.38	- 1.51	- 1.84	- 0.60	- 1.42	
	(3.07 [a])	(0.64)	(0.30)	(-3.12 [a])	(1.62)	(-3.00 [a])	(-2.69 [a])	(-1.20)	(-3.36 [a])	0.22
2000	- 0.11	- 0.01	- 0.50	- 0.18	0.46	- 0.20		0.35	- 0.05	
	(-0.37)	(-0.19)	(-2.95 [a])	(-3.12 [a])	(0.49)	(-0.51)	N/A	(1.09)	(-0.17)	0.16
2001	- 0.62	- 0.13	- 0.83	- 0.25		0.34	3.97	0.18	0.58	
	(-0.53)	(-0.36)	(-2.11 [b])	(-1.90 [c])	N/A	(0.18)	(2.55 [b])	(0.14)	(0.47)	0.17
1991–1995	- 0.55	0.37	- 0.58	- 0.69	- 0.59	1.64	2.08	- 0.05	0.42	
	(-0.72)	(1.78 [c])	(-3.17 [a])	(-3.52 [a])	(-0.20)	(1.31)	(1.64)	(-0.04)	(0.50)	0.09
1996–2001	0.10	1.08	- 2.94	- 0.14	1.16	- 0.16	- 0.36	0.44	- 0.30	
	(0.23)	(9.77 [a])	(-11.4 [a])	(-1.76 [c])	(0.43)	(-0.25)	(-0.29)	(0.83)	(-0.61)	0.25
1991–2001	0.21	0.82	- 0.85	- 0.40	0.72	0.23	1.67	- 0.32	- 0.36	
	(0.51)	(7.89 [a])	(-6.78 [a])	(-5.47 [a])	(0.37)	(0.38)	(2.04 [b])	(-0.64)	(-0.82)	0.13
Rising Market	- 0.34	0.78	- 1.22	- 0.52	4.69	0.81	3.67	0.44	0.14	
	(-0.68)	(6.54 [a])	(-6.94 [a])	(-4.77 [a])	(1.60)	(1.12)	(3.57 [a])	(0.76)	(0.28)	0.17
Declining Market	0.51	1.06	- 0.53	- 0.26	- 1.66	- 0.22	- 0.11	- 0.89	- 0.60	
	(0.75)	(5.50 [a])	(-2.88 [a])	(-2.76 [a])	(-0.58)	(-0.20)	(-0.08)	(-0.93)	(-0.78)	0.11

Table 6
Cross Sectional Analysis of Long-run Performance of Chinese IPOs, 1991 to 2001

This table reports the regression results for the long-run from

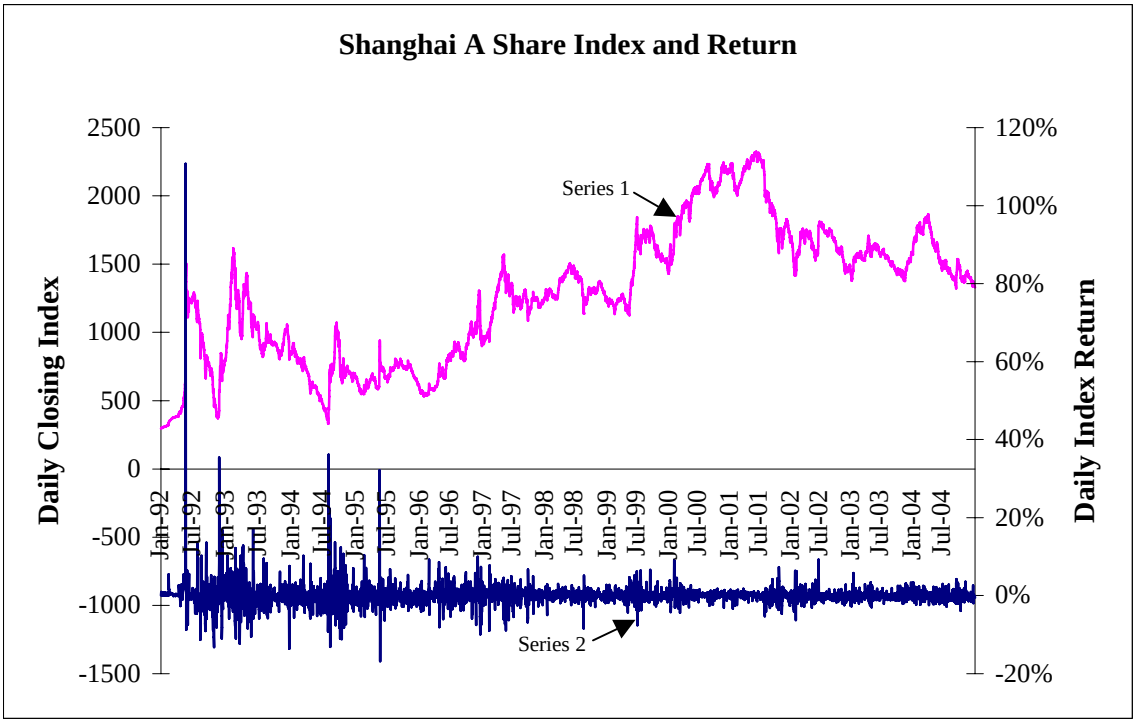
$$R_i - \overline{R} = \alpha_i + \beta_{Age}\left(\frac{A_i - \overline{A}}{\overline{A}}\right) + \beta_{\Pr ice}\left(\frac{P_i - \overline{P}}{\overline{P}}\right) + \beta_{Size}\left(\frac{S_i - \overline{S}}{\overline{S}}\right) + \sum_{j=1}^{5} \gamma_j D_{i,j} + \varepsilon_i , \quad (6)$$

where R_i is the three-year return of IPO *i*, $\overline{R}$ is the corresponding average of R_i in the same time period, α_i is the intercept, A_i is the age of firm *i*, $\overline{A}$ is the corresponding average of A_i in the same time period, and β_{Age} is the age sensitivity. Analogously, P_i and S_i are the offer price and offer size for IPO *i*, $\overline{P}$ and $\overline{S}$ are the corresponding average offer price and offer size of P_i and S_i in the same time period, and $\beta_{\Pr ice}$ and β_{Size} are the price and size sensitivities. The dummy $D_{i,j}$ captures the differences in six industries; it is one if IPO *i* belongs to industry *j* and is zero otherwise, and γ_j is the coefficient of the dummy with *j* = 1 (finance), 2 (utility), 3 (property), 4 (conglomerate), and 5 (industrial). N/A means that the IPOs are not available during the specified time period. $\overline{R}^2$ is the adjusted R-squired. [a], [b], and [c] denote significance at the one, five, and ten percent levels.

Time	α	β_{Age}	$\beta_{\Pr ice}$	β_{Size}	γ_1	γ_2	γ_3	γ_4	γ_5	$\overline{R}^2$
1992	- 0.37	- 0.05	- 5.83	- 0.94		1.03	4.97	- 0.96	- 0.51	
	(-0.17)	(-0.08)	(-5.75 [a])	(-2.60 [b])	N/A	(0.30)	(2.05 [b])	(-0.28)	(-0.23)	0.71
1993	0.48	0.74	- 5.16	- 0.42		1.66	1.03	- 1.39	- 1.04	
	(0.37)	(2.38 [b])	(-6.18 [a])	(-1.43)	N/A	(0.87)	(0.53)	(-0.70)	(-0.73)	0.34
1994	0.59	- 0.09	- 2.84	- 0.20	0.27	- 0.71	- 0.25	- 0.13	- 1.04	
	(1.39)	(-0.65)	(-4.91 [a])	(-1.66 [c])	(0.21)	(-0.93)	(-0.30)	(-0.19)	(-2.05 [b])	0.23
1995	- 1.32	3.98	- 2.06	- 2.48		- 2.42	0 21	- 9.63	3.55	
	(-0.51)	(1.76 [c])	(-1.27)	(-2.18 [b])	N/A	(-0.42)	(0.04)	(-1.52)	(1.18)	0.52
1996	- 0.67	0.61	- 5.08	- 1.15		0.87	- 1.54	1.56	0.57	
	(-0.96)	(2.72 [a])	(-8.30 [a])	(-2.64 [a])	N/A	(0.75)	(0.63)	(1.74 [c])	(0.75)	0.47
1997	0.20	1.41	- 6.61	- 0.30		- 0.29		- 0.13	0.14	
	(0.22)	(5.06 [a])	(-7.93 [a])	(-0.90)	N/A	(-0.29)	N/A	(-0.12)	(0.10)	0.41
1998	- 1.70	1.08	- 5.62	- 0.16		0.69	1.90	2.59	1.69	
	(-0.75)	(4.92 [a])	(-4.65 [a])	(-0.42)	N/A	(0.24)	(0.38)	(1.03)	(0.73)	0.40
1999	1.24	0.01	- 0.21	- 0.55	2.25	- 1.46	- 1.64	- 0.97	- 1.37	
	(3.66 [a])	(0.01)	(-0.84)	(-4.55 [a])	(1.84 [b])	(-3.49 [a])	(-2.88 [a])	(-2.30 [b])	(-3.90 [a])	0.29
2000	- 0.11	- 0.02	- 0.71	- 0.12	0.30	- 0.26		0.01	- 0.71	
	(-0.41)	(-0.26)	(-4.71 [a])	(-2.40 [b])	(0.36)	(-0.75)	N/A	(0.04)	(-4.71 [a])	0.19
2001	0.11	- 0.12	- 0.24	- 0.02		0.69	0.55	- 0.12	- 0.19	
	(0.40)	(-1.55)	(-2.67 [a])	(-0.65)	N/A	(1.60)	(1.55)	(-0.41)	(-0.69)	0.19
1991–1995	- 0.52	0.50	- 0.45	- 0.72	- 0.28	1.60	1.95	- 0.33	0.43	
	(-0.71)	(2.48 [b])	(-2.54 [b])	(-3.84 [a])	(-0.10)	(1.33)	(1.60)	(-0.28)	(0.52)	0.09
1996–2001	0.33	0.98	- 3.44	- 0.22	1.32	- 0.18	- 2.37	0.09	- 0.50	
	(0.72)	(8.86 [a])	(-13.4 [a])	(-2.76 [a])	(0.49)	(-0.27)	(-1.95 [c])	(0.17)	(-1.03)	0.29
1991–2001	0.46	0.73	- 0.84	- 0.53	1.24	0.17	0.99	- 0.84	- 0.58	
	(1.12)	(7.03 [a])	(-6.61 [a])	(-7.18 [a])	(0.63)	(0.28)	(1.20)	(-1.66 [c])	(-1.31)	0.14
Rising Market	- 0.13	0.69	- 1.16	- 0.74	5.82	0.71	2.61	- 0.07	0.02	
	(-0.25)	(5.77 [a])	(-6.55 [a])	(-6.62 [a])	(1.96 [b])	(0.97)	(2.51 [b])	(-0.12)	(0.95)	0.17
Declining Market	0.78	0.99	- 0.53	- 0.32	- 1.09	- 0.08	- 0.44	- 1.26	- 0.93	
	(1.11)	(5.09 [a])	(-2.86 [a])	(-3.33 [a])	(0.38)	(-0.07)	(-0.32)	(-1.32)	(-1.21)	0.12

Figure 1
Daily A Share Closing Index, Returns, and Stock Market Cycles at the Shanghai Stock Exchange, January 1992 to December 2004

The Figure shows the daily A share closing index and returns at the Shanghai Stock Exchange over the period January 1992 to December 2004. Series 1 is the daily A share closing index and series 2 is the daily index returns. A rising stock market is defined as more than a 30% increase in the index from its previous low and a declining stock market is defined as more than a 30% drop in the index from its previous high.

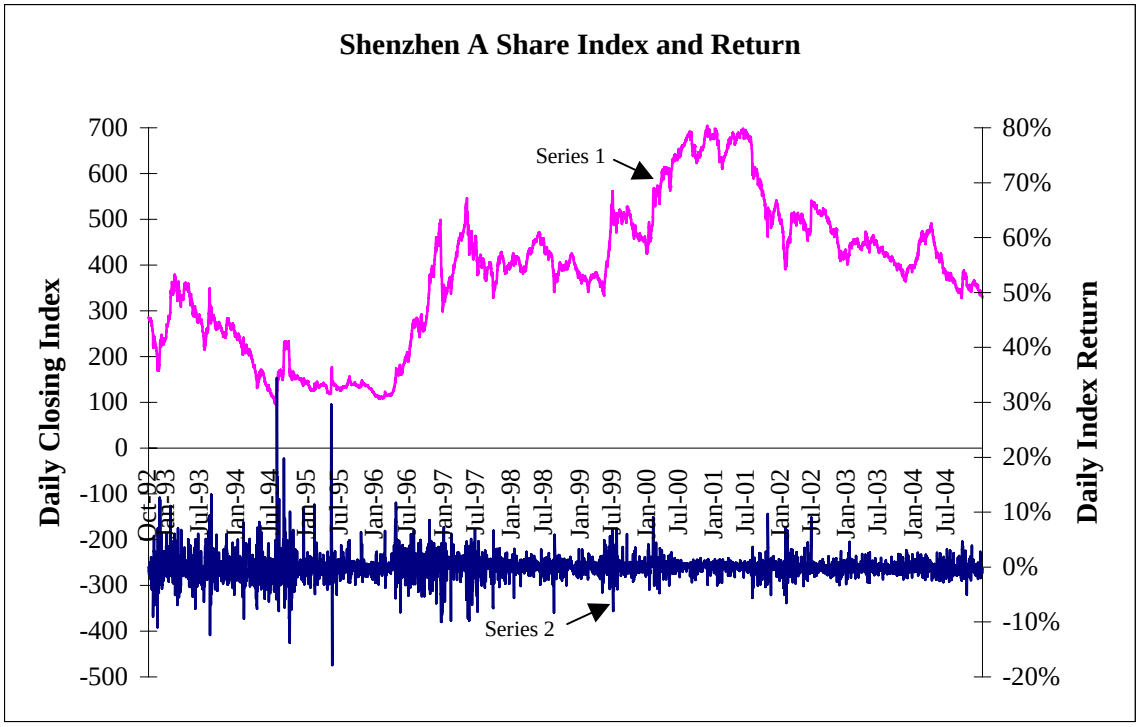


Shanghai Stock Market Cycles

Date	Closing Index	Net Change	Percent Change	Market Cycle
1/02/1992	293.75			
5/25/1992	1503.20	1209.45	411.72%	Rise to peak
11/17/1992	369.94	- 1133.26	- 75.39%	Drop to bottom
2/15/1993	1615.94	1246.00	336.81%	Rise to peak
3/31/1993	954.41	- 666.53	- 40.94%	Drop to bottom
4/28/1993	1433.92	479.51	50.24%	Rise to peak
7/29/1994	328.85	- 1105.07	- 77.06%	Drop to bottom
9/13/1994	1072.73	743.88	226.20%	Rise to peak
2/17/1995	547.54	- 525.19	- 48.95%	Drop to bottom
5/22/1995	940.52	392.98	71.77%	Rise to peak
1/22/1996	531.38	- 409.14	- 43.50%	Drop to bottom
5/12/1997	1568.99	1037.61	195.26%	Rise to peak
9/23/1997	1085.79	- 483.20	- 30.79%	Drop to bottom
6/06/2001	2328.31	1242.52	114.43%	Rise to peak
12/31/2004	1330.19	- 998.12	- 42.86%	Drop to bottom

Figure 2
Daily A Share Closing Index, Returns, and Stock Market Cycles at the Shenzhen Stock Exchange, October 1992 to December 2004

The Figure shows the daily A share closing index and returns at the Shenzhen Stock Exchange over the period October 1992 to December 2004. Series 1 is the daily A share closing index and series 2 is the daily index returns. A rising stock market is defined as more than a 30% increase in the index from its previous low and a declining stock market is defined as more than a 30% drop in the index from its previous high.



Shenzhen Stock Market Cycles

Date	Closing Index	Net Change	Percent Change	Market Cycle
10/02/1992	285.84			
11/23/1992	169.04	- 116.80	- 40.86%	Drop to bottom
2/22/1993	379.07	210.03	124.24%	Rise to peak
7/21/1993	214.89	- 164.18	- 43.31%	Drop to bottom
8/16/1993	349.30	134.41	62.54%	Rise to peak
7/22/1994	97.36	- 251.94	- 72.12%	Drop to bottom
9/28/1994	233.32	135.96	139.64%	Rise to peak
5/10/1995	118.32	- 115.00	- 49.28%	Drop to bottom
5/22/1995	176.77	58.45	49.40%	Rise to peak
1/22/1996	107.93	- 68.84	- 38.94%	Drop to bottom
12/09/1996	491.03	383.10	354.95%	Rise to peak
12/24/1996	298.82	- 192.21	- 39.14%	Drop to bottom
5/12/1997	546.01	247.19	82.72%	Rise to peak
9/23/1997	328.92	- 217.09	- 39.76%	Drop to bottom
6/06/2001	695.08	366.16	111.32%	Rise to peak
12/31/2004	328.69	- 366.39	- 52.71%	Drop to bottom

Figure 3
Monthly IPO Volume and Average Initial Returns, 1991 to 2001

The figure shows the relationship between monthly IPO volume and equally-weighted average initial returns for 1,130 Chinese A share IPOs over the period 1991 to 2001. Series 1 is the monthly IPO volume and series 2 is the average initial returns.

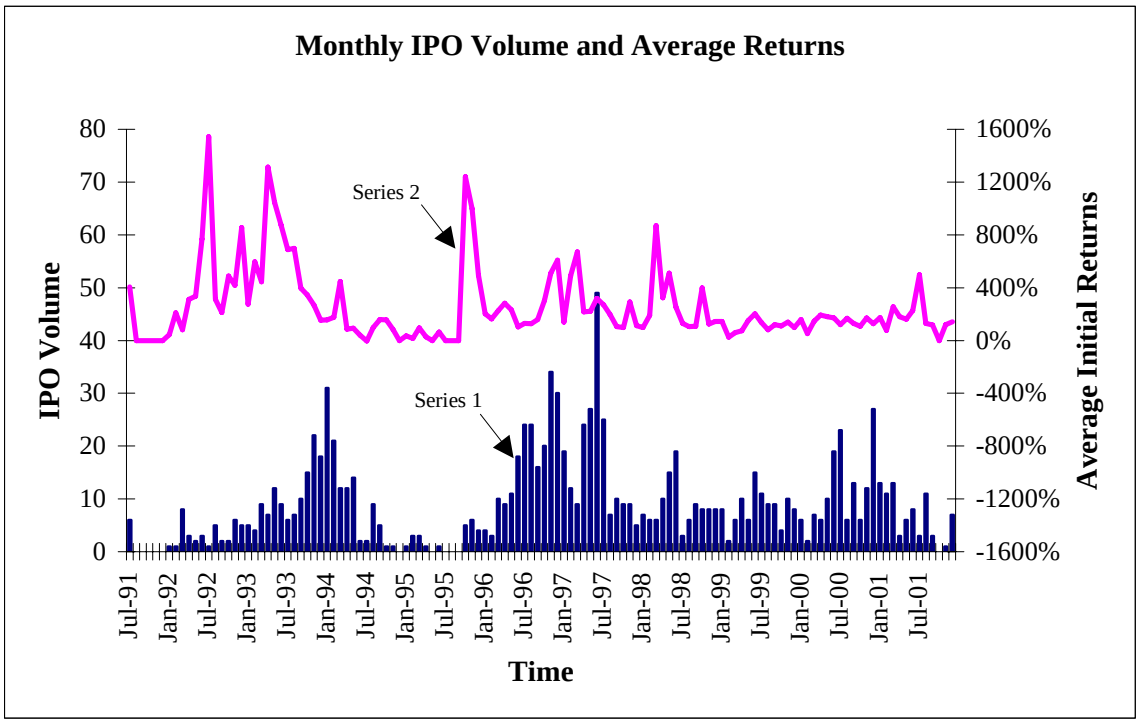


Figure 4
Cross Correlation of Monthly IPO Volume and Average Initial Returns, 1991 to 2001

The figure shows the cross correlation of monthly IPO volume and average initial returns for 1,130 Chinese A share IPOs over the period 1991 to 2001, using plus and minus 12 month lags.