

Under-pricing and Long-term Performance of IPOs in China

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ABSTRACT

We study the under-pricing and long-term performance of 570 A-share IPOs and 39 B-share IPOs issued in China. The average under-pricing for A-share IPOs is 178%, while the average under-pricing for B-share IPOs is only 11.6%. Some institutional characteristics in China could explain the under-pricing of A-share IPOs. The under-pricing is positively related to the number of days between the offering and the listing and the number of stock investors in the province from which the IPO comes, but it is negatively related to the number of shares being issued. In contrast, none of these characteristics explain the under-pricing of B-share IPOs. In the long-run, there is no stock price underperformance of either A-share and B-share IPOs. Furthermore, the stock price performance is partially related to the operating performance of the company.

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1. Introduction

This paper investigates the short-term and long-term performance of initial public offerings (IPOs) of common stocks in China. The purpose of this study is not simply to add another piece of evidence to the vast literature on IPO under-pricing. Rather, we would like to investigate how the under-pricing of IPOs is affected by some institutional factors in the centrally planned IPO market in China.

IPO under-pricing – the phenomenon of a large positive gain to a new issue (relative to its offering price) immediately after listing – has been found in many markets. Loughran, Ritter, and Rydqvist (1994) document evidence of IPO under-pricing in 25 countries, with higher IPO under-pricing in developing than in developed markets.¹ Compared with the international evidence from other countries, the magnitude of under-pricing in China is even more phenomenal. Mok and Hui (1998) find that the under-pricing of A-shares in Shanghai was 289%. Su and Fleisher (2000) show that the under-pricing could exceed 948% if IPOs from earlier years were included in the sample. Many different theories, such as information asymmetry and signaling models, are offered to explain the IPO under-pricing phenomenon [Allen and Faulhaber (1989), Grinblatt and Hwang (1989), Welch (1989), and Chemmanur (1993)].² It is unlikely that these models can explain the magnitude of under-pricing in China.

An interesting characteristic of the Chinese IPO market is that the aggregate amount of new shares issued each year is determined by the central government. Furthermore, the new issues typically represent a small proportion of the outstanding shares, as the majority of other shares is owned by the

¹ Please visit Jay Ritter's website at <http://bear.cba.ufl.edu/ritter/internl.htm> for the most recent updated information.

² There are some theories to explain the IPO underpricing that focuses on the role of underwriters in resolving the asymmetric information. See, for example, Sherman (2000) and Sherman and Titman (2001) among others.

state or other legal entities and is not available to public investors.³ As a result, the amount of new shares made available in the market is not sufficient to satisfy the demand of Chinese investors who have very few alternative investment choices. Another rigidity in the IPO market is that the offering price is monitored by the China Securities Regulatory Commission (CSRC). In order to muster the enthusiasm of the investors and to guarantee a full subscription, the offering price is set far below what the market is willing to pay. As a result, this creates massive speculation on IPOs when they are listed.

A few papers have investigated the IPO under-pricing phenomenon in China. Mok and Hui (1998) examine the pricing of IPOs in the early years of China's stock market (before 1993), while Su and Fleisher (1999) focus on the signaling model to explain the under-pricing of IPOs in China. In this paper, we examine the performance of the IPOs using a more recent sub-period (A-share IPOs from 1993 to 1998 and B-share IPOs 1995 to 1998). Another contribution is that we examine what institutional factors can explain differences in IPO under-pricing across different stocks. Consistent with previous studies, we find that there are large abnormal returns (178%) to the A-share IPOs on the first trading day. We show that the cross-sectional variations of abnormal returns can be explained by some institutional characteristics, including the percentage of equity retained by the state and legal entities, the time lag between offering and listing, and the stage of development of the province from which the IPO firm comes, which is proxied by the number of stock investors in that province. As for B-shares, since foreign investors have a large investment opportunity set outside China, there is less speculation on B-share Chinese IPOs, and the average return of the IPOs on the first day of trading is only 11.6%. Furthermore, the under-pricing of the B-share IPOs cannot be explained by institutional characteristics. We also investigate the short-term and long-term performance of the IPOs after the listing. Although there seems to be further price adjustments for both A-share and B-share IPOs during the short run (one month), there is no significant difference between their performance and the market in the long run. Finally, the long-run stock price performance is partially related to operating performance.

³ The shares owned by the state or legal entities cannot be traded in the stock exchanges.

The remainder of this paper is organized as follows. Section 2 discusses the institutional characteristics of the Chinese IPO market. Section 3 presents the data and preliminary analysis. Section 4 provides evidence on the determinants of cross-sectional variations of under-pricing and on the short-term and long-term performance of IPOs. Section 5 concludes the paper.

2. Characteristics of the Chinese IPO market

Following the economic reforms that began in 1978, the Chinese stock market was finally established in the early 1990s. The Shanghai Securities Exchange was opened in 1990, followed by the establishment of the Shenzhen Stock Exchange in 1991. At the same time, the Chinese stock market was made partially accessible to foreign investors. Non-PRC nationals could trade either B shares listed on the two stock exchanges in Shanghai and Shenzhen, H-shares listed on the Stock Exchange of Hong Kong, and N-shares listed on the New York Stock Exchange.

There are five types of shares in China: (1) government shares, which are held by the State Assets Management Bureau (SAMB); (2) legal entity shares (or C shares), which are held by other state-owned enterprises; (3) employee shares, which are held by managers and employees; (4) ordinary domestic individual shares (or A-shares), which can be purchased only by Chinese citizens of the PRC on the Shanghai Securities or the Shenzhen Stock Exchange; and (5) foreign shares, which can be purchased only by foreign investors in Mainland China (B-share), in Hong Kong (H-share), or on the NYSE (N-share). Only the A-shares and B-shares are listed on the Shanghai Securities and Shenzhen Stock Exchanges. The first three types of shares are not tradable in the official exchanges, although employee shares are allowed to be listed three years after the IPO.

The initial public offering process in China has vestiges of China's transitional economy with socialist planning. First, the aggregate value of new shares to be issued each year is a part of the national investment and credit plan. The new share issue quota is determined jointly by the State Council Securities Committee (SCSC), the State Planning Commission (SPC), and the People's Bank of

China (PBOC) (which is the central bank in China). The quota is allocated to provinces as well as to municipalities. The criteria used for allocation among provinces include the assessment of regional needs based on the production structure and industrial base and recognition of balanced regional development to attain distribution objectives. Within each regional quota, the local securities authorities invite enterprises to request a listing and then make a selection based on the criteria that combines good performance as well as sectional development objectives. This process of selecting enterprises for listing in China differs considerably from a more mature market economy, where the decision to list an enterprise is usually determined by the stock exchange.

Because the aggregate supply of new shares is controlled by the central government, the supply fails to meet the demand of public investors who generally lack alternative investment choices. This is because the financial markets remain poorly developed and Chinese capital controls make it difficult to invest overseas. As a result, this creates huge speculation on the IPOs as public investors invariably rush to submit applications whenever there are new issues. The speculation is further fueled by the inefficiency of the offering price determination process, which is monitored by the CSRC. In order to rouse the enthusiasm among investors and to guarantee a full subscription, the offering price is set far below what the market would be willing to pay. From 1993-1998, the IPOs in China essentially adopted an administrative pricing policy. During this time, the IPO price was set around 15 times of the earnings per share and in the range of 13~16 times.⁴ Furthermore, the offering price was chosen months before

⁴ However, there is no official regulation about what the exact P/E ratio is used for pricing IPOs. In addition, the detailed IPO pricing policies have been changed several times in the past. Before 1996, IPO pricing was based on the forecasted P/E ratio. The CSRC's December 26, 1996 notice changed IPO pricing to be based on the realized arithmetic average P/E ratio in the past three years. The CSRC's September 10, 1997 notice modified the IPO pricing formula to: IPO price = EPS * P/E, where EPS = 0.7 * EPS in the year before the IPO + 0.3 * Forecasted diluted EPS during the IPO year, and the P/E should be within the maximum and minimum allowed P/Es with a very complicated formula. The CSRC's March 17, 1998 notice changed the IPO pricing formula to: IPO price = (Forecasted Earnings/Weighted Average Number of Shares Outstanding in the IPO year) * P/E. The CSRC's July 28, 1999 notice began to allow issuers and underwriters to set an initial offering price range subject to the approval from the CSRC. The final offering price must fall in the price range approved by the CSRC. If the final offering price is outside the price range, it needs to be re-approved by the CSRC. Recently, the CSRC issued a consultancy paper to solicit public opinions on how to use the online auction method to price IPOs.

the official trading began and, in the great majority of offerings, there was no feedback mechanism that allowed the market demand to influence the final offering price.

Another factor contributing to the speculation on IPOs is the method of share allocation. At the beginning, the share allocation was based primarily on a lottery system in which there was a fixed number of application forms. Each retail investor was allowed to purchase a limited number of lottery forms, and lottery winners were entitled to a certain number of shares per winning form. The lottery mechanism has undergone several changes subsequently. One modification is to allow an unlimited number of application forms, so that investors can buy as many application forms as they would like. Another modification is to require the investors to deposit a certain amount of money into a special saving account when submitting applications for shares, with the deposit frozen until the lottery was completed. Despite these changes, there is no feedback from market demand in setting the offering price. Although an auction mechanism was introduced in recent years, the price was fixed to a certain extent and investors could only bid on the quantity of shares they would buy, not on the price of the shares.

Another characteristic of the Chinese IPO market is that new issues reflect only a small proportion of outstanding shares. The majority of shares are still owned by the government or other legal entities. The retention of equity by the government has two opposing implications for IPO underpricing. When the state retains a high percentage of shares so that only a small percentage of shares are available to public investors, there could be more speculation so that returns on the first day of trading would be higher. On the other hand, a high percentage of shares being retained by the state may be equated with inefficiency and low productivity, leading to fewer investors buying the new shares on the first day of trading, so the initial return would be lower.

3. Data and summary statistics

Our data are retrieved from the Taiwan Economic Journal (TEJ) database. The sample period for A-share IPOs is from January 1993 to December 1998. As for B-shares, although the first B-share IPO was in February 1992, it was not until 1995 that more new issues were regularly introduced into the market. Consequently, we study the B-share IPOs only from January 1995 to December 1998. As we mentioned earlier, there is a long time lag between the offering date and the listing date. We exclude those new issues that have elapsed time between these dates longer than 360 days. The final sample includes 570 A-share IPOs and 39 B-share IPOs.

The under-pricing of an IPO issue is calculated as the return on the first day of trading (relative to the offering price):

$$Ret_0 = \frac{1}{n} \sum_{i=1}^n \left(\frac{P_{i0}}{P_{il}} - 1 \right)$$

where Ret_0 is the average return (under-pricing) of the IPOs on the first trading day (day 0), P_{i0} is the closing price of stock i on day 0, and P_{il} is the offering price of stock i . We also adjust the return for the market effect:

$$Adjret_0 = \frac{1}{n} \sum_{i=1}^n \left(\frac{P_{i0}}{P_{il}} - \frac{P_{i,m0}}{P_{i,ml}} \right)$$

where $Adjret_0$ is the average of the market-adjusted returns of IPOs on day 0, $P_{i,m0}$ is the closing value of the corresponding Shanghai or Shenzhen A-share or B-share market index on the first trading day of the new issue i , $P_{i,ml}$ is the closing value of the corresponding Shanghai or Shenzhen A-share or B-share market index on the offer day of the new issue i .

We will include several variables to explain cross-sectional variations of under-pricing. The first variable is the number of days between the offering and the listing ($Lday$). Unlike the developed market where only a short time elapses between the offering and the listing, it is typical in China for the

new issues to be offered for public subscription at least two months before their listing on the stock exchanges. Due to the asymmetric information distribution among the issuer, underwriters and investors (Baron (1982) and Rock (1986)) and to the fact that funds will be tied up, the longer time gap between the offering and the listing will increase the risk to the investors so that a larger under-pricing is required. Therefore, we expect a positive relation between *Lday* and the under-pricing.

The second variable is the number of shares being issued (*Lnum*). There is extensive evidence that suggests that the demand curve for shares in an individual company is not perfectly elastic (Shleifer (1986)). When there are more shares issued, investors do not need to buy the shares urgently on the first day of trading so that initial returns will be lower. Therefore, we expect a negative relation between *Lnum* and the under-pricing.

The third variable is the number of stock investors in the area (province or municipality) of the year when the IPO is issued (*Investor*). Since the listing criteria is not solely based on the quality of the companies, but is also determined by the central government that tries to balance the development of different provinces, not all IPOs are of similar quality. We conjecture that the IPOs from the more developed provinces are of higher quality than those from the less developed ones. The number of stock investors in the province is used as a proxy for the stage of development (wealth) of the area. We expect that there is a positive relation between *Investor* and the under-pricing.

The fourth variable is the percentage of the non-negotiable “state and institution” shares (*Percent*). When the state or legal entities retain a high percentage of shares, this might be perceived as an indicator of bureaucratic control and operating inefficiency. Therefore, fewer investors would be willing to pay a higher price. We conjecture that there is a negative relationship between *Percent* and the under-pricing.

Table 1 presents the unadjusted and the market-adjusted under-pricing for A-share and B-share IPOs. Panel A contains the results for the whole sample period as well as for each year. The average under-pricing for A-share IPOs was 177.8% for the whole period, while the average under-pricing for B-

share IPOs was only 11.6%. A breakdown of the IPOs by year shows that the under-pricing of A-shares was quite persistent. Except for 1995 when there were only four IPOs, the under-pricing was greater than 100% in other years.

Table 2 presents summary statistics of the variables that we use in explaining cross-sectional variations of the under-pricing. The median number of days between offering and listing (*Lday*) was 143 in 1993 and declined to 34 in 1998, indicating that the time lag between offering and listing became shorter in the latter years. The median number of shares per issue (*Lnum*) showed a steady increase from 20 million shares in 1993 to 50 million in 1998. The percentage of non-negotiable “state and institution” shares was quite stable over time and was around 50-70% in the sample period (*Percent*). On first examination of the data, it is surprising that the number of investors declined dramatically in 1995 before it increased again. What actually happened was that there were only 4 IPOs (see Table 1) in 1995. These IPOs came from less developed regions, which explains why the average number of investors was so low.

4. Empirical analysis of IPO under-pricing

4.1. Determinants of IPO under-pricing

We first analyze whether some of the institutional characteristics in China could explain the cross-sectional variations in IPO under-pricing. In addition to the four variables we discuss in the previous section (*Lday*, *Lnum*, *Percent*, and *Investor*), we also include some other control variables: the market return in the period between offering and listing (*Mktret*), an exchange dummy variable (*Exch*) that is equal to one if the new issues are listed on the Shenzhen Stock Exchange and zero if it is on the Shanghai Securities Exchange, the issue price (*Issp*), the age of the company (*Age*), and a dummy variable (*Offshore*) that is equal to one if the company issues some kind of offshore shares, such as H-shares in Hong Kong or N-shares in New York, and zero otherwise.

The regression results are reported in Table 3. Panel A contains the results for A-share IPOs. In the univariate regressions, the under-pricing of A-share IPOs is positively and significantly related to *Lday*, *Investor*, and *Percent*, and negatively and significantly related to *Lnum*. In the multivariate regression, except for *Percent* which is negatively related to the under-pricing, the coefficients of the other three variables are of the same sign as those in the univariate regressions in explaining the under-pricing. Panel B contains for the results for B-share IPOs. Unlike for the A-share IPOs, the under-pricing of B-share IPOs cannot be explained by any of the four institutional variables. In fact, none of the control variables explains the variations in the under-pricing. Therefore, the under-pricing of B-share IPOs is quite different from that of A-share IPOs. First, the magnitude of under-pricing of B-shares, as documented in Table 1, is much smaller. Second, there is no systematic force that explains the under-pricing of B-shares.

4.2. Short-term performance

If it takes more than one day for the market price to reflect the consensus estimates of the value of the IPOs, there could be further price adjustments following the first day of trading. We therefore examine the returns of the IPOs over a span of 21 trading days (approximately one month) following the first day of trading. We also compute the market-adjusted returns by subtracting the market return on the corresponding day from the return of the IPO:

$$Adjret_t = \frac{1}{n} \sum_{i=1}^n (Ret_{it} - Mktret_{it})$$

where Ret_{it} is the return of stock i on day t after listing ($t=1,2, \dots, 21$), $Mktret_{it}$ is the return of the corresponding market index (Shanghai A and B, Shenzhen A and B) on day t subsequent to the listing of stock i , and $Adjret_t$ is the average of the market-adjusted return of all the IPOs on day t . We also calculate the cumulative adjusted returns for each day t by cumulating the adjusted return from day 1 to day t .

Results are reported in Table 4 and plotted in Figures 1 and 2. For A-shares, the IPO issues generally underperform the market, as $Adjret_t$ is negative on most of the 21 trading days. The cumulative adjusted returns are all negative, starting at -0.572% on day 1 and declining to -1.665% on day 21. Nevertheless, this underperformance seems to be economically small when compared with the abnormal returns on the first day. Results for the B-share IPOs are exactly opposite. Except for a few trading days, the B-share IPO issues generally outperform the market. The cumulative market-adjusted returns are all positive, starting at 1.214% at day 1, and increasing to 9.739% at day 21. These results, coupled with earlier results that the abnormal returns to A-share IPOs are extraordinarily high and abnormal returns to B-share IPOs are only slightly greater than zero, suggest that there is mild overreaction to A-shares and underreaction to B-shares on the first trading day. As domestic investors rush to buy the A-share IPOs, bidding up the prices above reasonable levels on the first trading day, the subsequent price corrections cause the A-share IPOs to under-perform the market. Nevertheless, it seems that the price corrections are small relative to abnormal returns on day 0. On the other hand, foreign investors do not have much interest in buying the B-share IPOs so that there are price continuations for the new issues on subsequent days.

4.3. *Long-term performance*

Given that there are some price adjustments in the short run, an interesting question to ask is whether the adjustments will continue in the long run. In fact, Loughran and Ritter (1993, 1995) found that IPOs in the U.S. underperform significantly relative to non-issuing firms for 3 to 5 years after the listing date. Many studies also provide international evidence on the long-run underperformance of IPOs that is consistent with what has been observed in the U.S market.⁵

⁵ For example, see Levis (1995) for the U.K. market and Cai and Wei (1997) for the Japanese market.

We therefore follow the performance of the IPOs in the 36 months after listing. Instead of using the calendar month, we assume that there are 21 trading days in one month. Therefore, the first month consists of the first 21 trading days after listing, the second month consists of the day 22 through day 42 after listing, and so on. Panel A of Table 5 and Figure 3 report the results for A-share IPOs. Not surprisingly, the market-adjusted returns in the first month are equal to the cumulative adjusted returns in the first 21 trading days reported in Table 4. In the first few months, the cumulative market-adjusted returns are negative, suggesting that the A-share IPOs underperform the market. However, beginning with month five, the cumulative market-adjusted returns become positive and start to increase over time. By the end of the 36-month period, the A-share IPOs outperform the market by about 25%. Results for B-share IPOs are shown in Panel B of Table 5 and plotted in Figure 4. Similar to the A-shares, B-share IPOs also outperform the market. However, the cumulative market-adjusted returns are more erratic, reflecting that the data on the B-share IPOs is limited and we should be cautious in interpreting their results.

Another approach to examining the under-pricing and the long-run performance of the IPOs is to compare the Price/Earnings (P/E) ratios and the Book/Market (B/M) ratios of the new issues with the market over time. Table 6 reports this information before the offering, on the listing day, one year after the listing, two years after the listing, and three years after the listing. The P/E ratios are calculated using the earnings per share of the last year and the most recent closing price, while B/M ratios are calculated using the book value of the previous year and the most recent market value. From Table 6, it is immediately seen that there is huge under-pricing of A-share IPO issues. During the pre-offering stage, the average P/E ratio (using offering price for P) for the IPOs is around 15 while the average for the market is around 36. As soon as the trading starts, the IPO prices quickly adjust, and the P/E at the end of the first trading day is around 34. However, it is still slightly below the market P/E . The difference between the P/E of the new issues and the market is gradually wiped out and, three years after listing, the difference is trivial. This is another angle from which to see that the new issues outperform

the market over the long run (3-year period). As for B-share IPOs, during the pre-offering stage, the average P/E ratio for the IPOs is around 5.6 while the average for the market is around 10. There is, however, little adjustment of the P/E ratio of the new issues on the first trading day. However, over the long-run, we observe that the P/E ratio of the new issues increases gradually and finally settles at around 9.0 three years after the listing. This explains why the B-share IPOs also outperform the market over the 3-year window.

4.4. *Size and book-to-market factor loadings*

Two factors that we have not included in explaining returns of IPOs are the size and book-to-market effects. Many previous studies document that these two factors are important determinants of stock returns (Banz (1981), Chan, Hamao, and Lakonishok (1991), Daniel and Titman (1997), Daniel, Titman, and Wei (2001), Fama and French (1992), Davis (1994), Lakonishok, Shleifer, and Vishny (1994), and Loughran and Ritter (1995)). We will therefore employ the three-factor time series model of Fama and French (1993) in explaining the time-series variations of IPO returns over time.

To construct the Fama and French (1993) three factors, we include all stocks listed on the Shanghai Securities Exchange and the Shenzhen Stock Exchange that report the book value and market value of equity in the TEJ database. We calculate the book-to-market ratio at the end of June for each year t , based on the book value of equity for the most recent fiscal year ending in December of year $t-1$ and the market value of equity at the end of December of year $t-1$. According to CSRC regulations, listed companies should release their annual reports to several major newspapers from the middle of March to the end of April, so it is reasonable to assume that investors are able to obtain the financial information by the end of June. We obtain the book value of the company from TEJ directly and use the market value of equity in December of year $t-1$ to calculate the book-to-market ratio. We use the market value of equity at the end of June of year t as the firm size.

We then estimate the time-series regression of monthly returns on issuing companies and non-issuing companies as follows:

$$R_{pt} - R_{ft} = \alpha_0 + \alpha_1[R_{mt} - R_{ft}] + \alpha_2SMB_t + \alpha_3HML_t + \varepsilon_t$$

where $R_{pt} - R_{ft}$ is the excess return (in excess of three-month deposit interest rate R_{ft}) on portfolios consisting of issuing and non-issuing companies, respectively, $R_{mt} - R_{ft}$ is excess return on the value-weighted index of the Shanghai Securities Exchange and the Shenzhen Stock Exchange in month t , SMB_t is the difference between returns on small firm portfolios and large firm portfolios in month t , and HML_t is the difference between returns on high book-to-market (B/M) stocks and low book-to-market (B/M) stocks in month t . Large firms are those whose market capitalization at the end of June of the corresponding year t is greater than the median of market capitalization of all companies listed in the two stock exchanges, and small firms are those whose market capitalization is below the median. High B/M stocks are stocks whose B/M are in the top 30 percent, while low B/M stocks are stocks whose B/M are in the bottom 30 percent.

Results of the time-series monthly portfolio returns on the Fama-French three factors are reported in Table 7. The dependent variables are excess returns on the IPO portfolio, the non-IPO portfolio, and the difference between returns on the two portfolios. Overall, the abnormal returns (α_0) of any of the three portfolios are insignificantly different from zero after controlling for the effects of the three factors. However, the factor loadings for SMB seem to be different between IPO firms and non-IPO firms, as the IPO portfolio has a positive factor loading for SMB , while the non-IPO portfolio has a negative factor loading. This indicates that IPO firms are relatively smaller in size than non-IPO firms. The results appear to suggest that the outperformance (relative to the market index) of IPO firms three years after the offerings is due to the small firm effect. However, no matter what benchmarks (market-adjusted or the Fama-French three factors adjusted returns) we use, the stock long-run performance of

Chinese IPO stocks is at least as good as or even better than non-IPO firms, which is in contrast to the empirical findings documented in all other markets.

4.5. *Operating performance*

Given that the IPO firms outperform the market in terms of post-issue stock price performance, it is interesting to investigate if this outperformance is due to better operating performance after the public offerings. Table 8 reports changes in operating performance of IPO firms surrounding the issuing year, including operating return on assets (ROA), operating cash flows on total assets (CFOA), sales growth rate (Sale_G), asset turnover (ATO), and capital expenditures growth rate (CE). We also calculate industry-adjusted changes in operating performance, which is defined as the deviation of a given firm from the industry median. Results indicate that ROA, CFOA and ATO decline significantly after the issuance, regardless of which event window we use. For example, if we measure changes in performance from year $t-1$ to year $t+1$, ROA declines by 7.57%, CFOA declines by 7.30%, and ATO declines by 37%. On an industry-adjusted basis, the changes in operating performance remain statistically significant. These results are consistent with Jain and Kini (1994) and Mikkelsen, Partch, and Shah (1997) who find that IPO firms exhibit a decline in their post-issuance operating performance. We also find that both the sales growth rate and the capital expenditure growth rate of IPO firms exhibit substantial increases relative to the industry. Therefore, the inferior operating performance in ROA, CFOA, and ATO are not related to a decline in business activity. Rather, these results are consistent with the hypothesis that managers attempt to window-dress their accounting reports prior to going public, which leads to pre-IPO performance being over-stated and post-IPO performance being understated.⁶

⁶ See Aharony, Lee, and Wong (2000) for the evidence of earnings manipulations of H-shares and B-shares before their IPOs.

Table 9 reports the results of cross-sectional regressions of post-issuance stock returns on operating performance. The one-year and two-year abnormal returns are positively related to ΔROA , $\Delta CFOA$, and $\Delta Sale_G$. Therefore, despite the fact that managers tend to manipulate accounting reports before the IPOs, the information on the changes in operating performance is still important in adjusting the stock prices. This evidence also contradicts the conjecture that stock returns in the China market are purely driven by speculation. Instead, we find that the stock price performance is a partial reflection of the operating performance over the long run.

5. Conclusion

This paper studies the under-pricing, short-term, and long-term performance of 570 A-share IPOs issued in China between January 1993 and December 1998 and 39 B-share IPOs issued between January 1995 and December 1998. Consistent with results from previous studies, we find that there is a huge under-pricing of A-share IPOs, as the average return of the A-share IPO on the first trading day is 178%. In contrast, the under-pricing for B-share IPOs is much smaller, as they have an average return of only 11.6% on the first trading day.

We find that some institutional characteristics in China could explain cross-sectional variations of under-pricing of A-share IPOs, but not of B-share IPOs. First, the IPO under-pricing is positively related to the number of days between offering and listing, suggesting that public investors require a larger under-pricing if they have to wait longer to trade the new issues. Second, the under-pricing is negatively related to the number of shares being issued for the new company, suggesting that the large under-pricing is due to the limited supply of new shares. Third, the under-pricing is also positively related to the number of stock investors in the province from which the IPO comes. To the extent that the number of stock investors is an indicator of the wealth of the region, our results suggest that the companies from wealthier regions will have higher potential than those from poorer regions or that there are more high-quality firms that can be chosen from wealthier region. Finally, we also find that the

relationship between under-pricing and the percentage of non-negotiable “state-owned and legal-entity” stocks is mixed. The relation is positive in the univariate regression, but it changes to negative in the multivariate regression.

We also find some evidence of overreaction of A-share IPOs and underreaction of B-share IPOs, as the A-share (B-share) IPOs underperform (outperform) the market in the first month after the first trading day. In the long run (3-year period), both A-share and B-share IPOs outperform their corresponding market index by about 25% and 31% respectively. However, this outperformance can be explained by the Fama-French three factors. We also find that post-issuance stock returns are positively related to changes in operating return on assets, changes in operating cash flows on total assets, and changes in sales growth rate. This suggests that over the long run, stock price performance is not purely driven by speculation, but it is also a reflection of a firm’s operating performance.

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Table 1
The under-pricing of the IPOs in China from 1993 to 1998

This table reports the unadjusted and adjusted under-pricing of A-share and B-share IPOs in China. The sample includes 570 A-share IPOs between January 1993 and December 1998 and 39 B-share IPOs between January 1995 and December 1998. The unadjusted and adjusted under-pricing of the IPOs is defined as

$$Ret_0 = \frac{1}{n} \sum_{i=1}^n \left(\frac{P_{i0}}{P_{i1}} - 1 \right) \text{ and } Adjret_0 = \frac{1}{n} \sum_{i=1}^n \left(\frac{P_{i0}}{P_{i1}} - \frac{P_{i,m0}}{P_{i,m1}} \right), \text{ respectively. } P_{i1} \text{ is the closing price of stock } i$$

on the first trading day. P_{i0} is the offering price of stock i , P_{m1} is the closing price of the appropriate Shanghai or Shenzhen A-share or B-share market index on the first trading day of the new issue i , P_{m0} is the closing price of the appropriate Shanghai or Shenzhen A-share or B-share market index corresponding to the offering day of the new issue i .

The Under-pricing for A-share and B-share IPOs

Year	A-Share					B-Share				
	Unadjusted		Adjusted		N	Unadjusted		Adjusted		N
	Ret	T	Ret	T		Ret	T	Ret	T	
1993	3.378	11.78	3.289	11.75	120					
1994	1.266	10.36	1.379	10.93	70					
1995	0.140	1.90	0.168	1.83	4	0.053	1.72	0.063	2.04	9
1996	1.167	18.75	1.103	17.89	144	0.060	2.60	0.025	0.74	13
1997	1.495	26.64	1.497	27.27	186	0.240	3.39	0.297	4.14	14
1998	1.375	11.14	1.335	10.81	46	-0.03	-0.72	0.030	0.52	3
Avg	1.778	23.00	1.754	23.23	570	0.116	3.74	0.132	3.78	39

Table 2
Summary statistics for A-share and B-share IPOs in China

This table reports the summary statistics for A-share and B-share IPOs. *Lday* is the number of days between the offering and listing date, *Lnum* is the number of shares issued (in millions), *Age* is the number of years that the firm has existed before the IPO, *Percent* is the percentage of the non-negotiable state and institution shares, *Investors* is the number of stock investors in the region from which the IPO comes (in 10,000), *Issp* is the issue price of the IPOs.

Variable		A-Shares						B-shares					
		<i>Lday</i>	<i>Lnum</i>	<i>Age</i>	<i>Percent</i>	<i>Investors</i>	<i>Issp</i>	<i>Lday</i>	<i>Lnum</i>	<i>Age</i>	<i>Percent</i>	<i>Investors</i>	<i>Issp</i>
1993	Mean	143.74	27.98	20.14	73.43	103.98	4.25						
	Median	143.00	20.00	11.00	72.83	47.80	3.80						
1994	Mean	87.26	34.51	20.06	70.07	84.05	4.90						
	Median	76.50	21.90	10.00	72.07	46.40	5.00						
1995	Mean	14.00	30.00	2.00	54.02	23.00	5.20	21.89	79.11	7.44	56.57	62.01	2.80
	Median	14.00	30.00	2.00	54.02	23.00	5.20	24.00	60.00	2.00	56.83	47.80	2.32
1996	Mean	21.54	21.45	12.65	64.33	58.17	6.03	22.15	105.00	15.38	59.24	74.11	3.11
	Median	18.00	19.75	4.00	65.77	38.00	5.88	23.00	100.00	4.00	63.37	55.90	2.19
1997	Mean	21.36	52.69	11.61	62.84	83.16	6.27	19.14	134.03	31.64	55.77	122.13	3.29
	Median	20.00	40.00	4.00	63.96	63.20	6.15	21.00	100.73	39.00	57.15	117.30	3.40
1998	Mean	38.11	84.42	8.89	69.04	101.83	5.79	25.00	106.67	3.00	53.53	115.27	2.43
	Median	34.00	50.00	1.00	71.62	82.00	5.41	26.00	115.00	3.00	57.91	96.70	2.35
Avg	Mean	57.25	39.75	14.51	66.87	82.85	5.57	21.23	109.58	18.44	56.94	91.72	3.05
	Median	25.00	26.83	5.00	66.69	47.80	5.49	22.00	100.00	5.00	57.94	96.20	2.67

Table 3
The regression for the under-pricing of IPOs in China from 1993 to 1998

Panel A reports the under-pricing regression for A-share IPOs and Panel B for B-shares IPOs. The explanatory variables include the following: *Lday* is the number of days between the offering and listing date, *Lnum* is the number of shares issued, *Percent* is the percentage of the non-negotiable “state and institution” shares, *Investors* is the number of investors in the region that the IPO comes from, *Age* is the number of years that the company has existed before the IPO, *Exch* is a dummy variable which is equal to 1 if the new issue is listed in the Shenzhen Stock Exchange, and 0 if it is listed in the Shanghai Securities Exchange, *Mktret* is the return on the corresponding stock market index between the offering and listing date, *Issp* is the issue price and *Offshore* is a dummy variable that is equal to 1 if the new issue has issued any offshore share, and 0 otherwise. t-values are in parentheses.

Panel A: Regression for the under-pricing of A-Share IPOs

	Intercept	<i>Lday</i>	<i>Lnum</i>	<i>Percent</i>	<i>Investors</i>	<i>Age</i>	<i>Exch</i>	<i>Mktret</i>	<i>Issp</i>	<i>Offshore</i>	R ²
Coeff	-1.460	0.912									0.211
t-value	(-5.38)	(12.34)									
Coeff	7.845		-0.593								0.066
t-value	(8.14)		(-6.31)								
Coeff	1.559			0.023							0.023
t-value	(13.36)			(3.62)							
Coeff	1.212				0.144						0.008
t-value	(4.32)				(2.10)						
Coeff	1.749					0.002					0.001
t-value	(17.55)					(0.46)					
Coeff	1.890						-0.226				0.004
t-value	(17.40)						(-1.46)				
Coeff	1.731							1.969			0.060
t-value	(22.95)							(6.00)			
Coeff	3.807								-0.365		0.147
t-value	(17.52)								(-9.89)		
Coeff	1.785									-0.107	0.000
t-value	(22.37)									(-0.33)	
Coeff	4.293	0.617	-0.340				0.054	1.61	-0.23		0.322
t-value	(4.22)	(7.87)	(-4.06)				(0.41)	(5.74)	(-6.48)		
Coeff	4.835	0.661	-0.348	-0.013	0.116	-0.006	0.031	1.618	-0.253	0.065	0.335
t-value	(4.56)	(7.71)	(-4.14)	(-2.13)	(1.87)	(-1.72)	(0.23)	(5.78)	(-6.81)	(0.23)	

Table 3 (continued)

Panel B: The regression for the under-pricing of B-Share IPOs

	<i>Intercept</i>	<i>Lday</i>	<i>Lnum</i>	<i>Percent</i>	<i>Investors</i>	<i>Age</i>	<i>Exch</i>	<i>Mktret</i>	<i>Issp</i>	R^2
Coeff	0.180	-0.021								0.005
t-value	(1.168)	(-0.43)								
Coeff	-0.389		0.044							0.010
t-value	(-0.46)		(0.60)							
Coeff	0.212			-0.002						0.007
t-value	(1.15)			(-0.53)						
Coeff	0.027				0.021					0.008
t-value	(0.16)				(0.56)					
Coeff	0.064					0.003				0.125
t-value	(1.723)					(2.31)				
Coeff	0.067						0.074			0.033
t-value	(1.25)						(1.13)			
Coeff	0.113							-0.195		0.007
t-value	(3.54)							(-0.52)		
Coeff	0.056								0.017	0.013
t-value	(1.09)								(0.69)	
Coeff	-0.340	-0.019	0.036				0.078	-0.100	0.016	0.064
t-value	(-0.38)	(-0.36)	(0.51)				(1.12)	(-0.25)	(0.67)	
Coeff	0.096	-0.009	-0.003	-0.001	-0.001	0.003	0.069	0.028	0.010	0.158
t-value	(0.09)	(-0.15)	(-0.04)	(-0.18)	(-0.03)	(1.68)	(0.98)	(0.07)	(0.38)	

Table 4

The short-term performance of the IPOs in China

This table presents the short-term performance of the IPOs after listing. *Ret* is the daily return of the IPO on day *t* after the trading, *Mktret* is the market return on the corresponding day *t*, *Adjret* is the market-adjusted return of the IPOs, *Cumret* is the cumulative return of the IPOs, and *Cum Adjret* is the cumulative market-adjusted return of the IPOs. * and ** represent the significance level at 10% and 5%, respectively.

Panel A: A-Share IPOs

Day	N	<i>Ret</i>	<i>Mktret</i>	<i>Adjret</i>	<i>Cumret</i>	<i>Cum Adjret</i>
1	570	-0.130	0.442	-0.572**	-0.130	-0.572**
2	570	0.293	0.134	0.159	0.233	-0.341
3	570	-0.224	0.010	-0.234	0.015	-0.569
4	570	0.086	0.282	-0.196	0.104	-0.770*
5	570	0.123	0.253	-0.130	0.299	-0.896**
6	570	-0.129	-0.032	-0.097	0.199	-0.966**
7	570	0.335	0.201	0.135	0.512	-0.847*
8	570	-0.117	0.194	-0.310**	0.511	-1.090**
9	570	-0.080	0.000	-0.080	0.496	-1.091*
10	570	-0.309	-0.071	-0.238**	0.234	-1.304**
11	570	-0.296	0.061	-0.358**	-0.107	-1.653**
12	570	-0.089	0.315	-0.403**	-0.131	-2.027**
13	570	0.166	0.198	-0.033	0.074	-2.051**
14	570	-0.097	0.033	-0.131	0.054	-2.124**
15	570	0.145	0.217	-0.072	0.160	-2.301**
16	570	-0.231	-0.143	-0.081	-0.055	-2.352**
17	570	0.245	0.159	0.086	0.237	-2.313**
18	570	0.149	0.033	0.116	0.552	-2.175**
19	570	0.079	0.029	0.050	0.712	-2.106**
20	570	0.199	0.076	0.123	0.991	-1.923**
21	570	0.478	0.346	0.132	1.674	-1.665**

Panel B: B-Share IPOs

Days	N	<i>Ret</i>	<i>Mktret</i>	<i>Adjret</i>	<i>Cumret</i>	<i>Cum Adjret</i>
1	39	1.409	0.195	1.214*	1.409	1.214*
2	39	0.812	0.152	0.661	2.352	2.003*
3	39	0.251	0.510	-0.259	2.624	1.760
4	39	0.626	0.323	0.303	3.222	2.035
5	39	0.338	0.144	0.194	3.623	2.255
6	39	0.127	0.120	0.006	3.857	2.352
7	39	1.181	0.661	0.520	5.271	3.086*
8	39	0.618	0.428	0.189	6.122	3.419*
9	39	0.269	-0.305	0.574	6.346	3.954**
10	39	0.221	0.097	0.124	6.676	4.145**
11	39	1.303	0.773	0.530	8.427	4.927**
12	39	0.384	0.902	-0.519	8.963	4.357**
13	39	0.241	-0.449	0.690*	9.306	5.290**
14	39	0.186	-0.210	0.396	9.735	5.998**
15	39	-0.019	-0.589	0.571	9.978	6.918**
16	39	1.325	-0.011	1.336*	12.314	9.178**
17	39	-0.892	-0.519	-0.373	11.114	8.470**
18	39	1.113	0.426	0.687	12.131	9.000**
19	39	0.088	-0.251	0.338	12.786	9.817**
20	39	-0.114	0.056	-0.170	12.859	9.755**
21	39	0.212	0.593	-0.381*	13.661	9.739**

Table 5**The long-term performance of the IPOs in China**

This table presents the long-term performance of the IPOs in China after listing. One month consists of 21 trading days. *Ret* is the daily return of the IPO on month *t* after the trading, *Mktret* is the market return on the corresponding month *t*, *Adjret* is the market-adjusted return of the IPOs, *Cumret* is the cumulative return of IPOs, and *Cum Adjret* is the cumulative market-adjusted return of the IPO. * and ** represent the significance level at 10% and 5%, respectively.

Panel A: A-share IPOs

Months	N	<i>Ret</i>	<i>Mktret</i>	<i>Adjret</i>	<i>Cumret</i>	<i>Cum Adjret</i>
1	570	1.674	3.339	-1.665**	1.674	-1.665**
2	570	-2.050	-1.179	-0.871*	-1.266	-2.820**
3	570	0.717	-0.461	1.177**	-0.916	-1.628
4	570	3.532	2.226	1.306	2.912	-0.269
5	570	1.671	-0.134	1.805**	4.102	1.063
6	570	2.538	1.147	1.391**	5.682	2.323
7	570	3.077	2.311	0.766**	8.022	3.319**
8	570	2.182	2.084	0.097	8.978	3.033**
9	570	1.977	1.410	0.567	10.412	4.059**
10	570	2.646	1.756	0.890*	11.993	4.615**
11	570	2.260	0.934	1.326**	13.723	6.392**
12	570	-0.829	-1.338	0.509	11.433	6.257**
13	570	0.549	-0.658	1.207**	11.278	7.176**
14	570	-0.629	-0.832	0.203	11.121	7.622**
15	570	1.879	0.617	1.261**	12.452	8.745**
16	570	3.534	1.974	1.560**	15.047	10.446**
17	570	2.013	0.743	1.270**	16.656	12.295**
18	570	1.295	0.150	1.146**	17.890	13.799**
19	558	2.860	0.819	2.041**	20.753	15.924**
20	548	6.537	4.712	1.824**	25.364	18.460**
21	540	2.390	0.603	1.787**	27.426	19.820**
22	537	0.598	-0.622	1.220**	27.084	20.328**
23	526	2.150	1.602	0.548	29.062	20.904**
24	522	1.777	0.839	0.938**	30.254	21.521**
25	514	0.614	0.507	0.107	29.156	20.436**
26	506	3.114	1.752	1.363**	32.205	22.272**
27	497	1.787	2.290	-0.503	32.824	21.733**
28	492	1.897	2.087	-0.190	33.785	21.772**
29	481	4.736	4.067	0.669	39.135	23.942**
30	435	5.065	3.564	1.501**	42.992	24.437**
31	401	3.383	3.988	-0.605	46.127	23.294**
32	374	3.913	4.074	-0.160	52.489	23.087**
33	366	4.457	3.890	0.567	60.053	25.312**
34	353	4.852	4.118	0.734	66.088	26.678**
35	337	4.516	4.422	0.094	70.634	24.780**
36	319	3.015	2.063	0.951	74.416	24.897**

Table 5 (continued)

Panel B: B-share IPOs

Months	N	<i>Ret</i>	<i>Mktret</i>	<i>Adjret</i>	<i>Cumret</i>	<i>Cum Adjret</i>
1	39	13.661	3.922	9.739**	13.661	9.739**
2	39	4.653	-1.055	5.708	15.778	13.999**
3	39	-1.262	-0.717	-0.545	12.281	11.215**
4	39	1.564	1.160	0.404	13.278	11.110**
5	39	6.502	2.218	4.283**	23.471	17.570**
6	39	3.367	1.339	2.028	25.329	19.081**
7	39	0.421	0.015	0.406	25.704	18.351**
8	39	5.051	2.558	2.493	34.426	24.152**
9	39	2.250	-0.953	3.204**	37.651	28.240**
10	39	-7.431	-2.424	-5.007**	30.828	23.068**
11	39	1.868	-1.296	3.164*	31.856	26.101**
12	39	1.082	2.902	-1.820	39.016	28.437**
13	39	1.631	-1.228	2.858	41.456	33.361**
14	39	8.184	3.221	4.963*	46.531	36.986**
15	39	-6.944	-3.316	-3.629**	33.720	29.070*
16	39	6.533	4.773	1.760	49.186	36.242*
17	39	-2.583	-3.569	0.986	44.334	36.703*
18	39	-6.771	-4.215	-2.556*	32.953	29.078*
19	39	3.594	2.011	1.584	29.525	25.677
20	38	-1.727	-0.006	-1.722	29.441	26.103
21	37	2.792	1.938	0.854	28.267	27.649
22	36	-0.675	3.393	-4.067*	26.364	25.917
23	36	-1.412	-2.800	1.388	14.271	20.575
24	36	7.192	2.133	5.059**	12.750	20.605
25	36	-6.642	-6.351	-0.291	-0.269	14.713
26	34	1.446	-1.048	2.494	5.719	22.565
27	33	-6.222	-6.700	0.477	-1.853	20.133
28	32	-0.256	-0.814	0.558	-2.405	20.595*
29	30	-0.538	-1.115	0.577	-1.342	22.209*
30	27	9.530	4.123	5.407	6.703	24.092*
31	24	-0.287	-0.091	-0.196	3.888	19.471
32	24	6.312	3.393	2.919	4.012	20.324
33	23	5.171	4.797	0.373	11.700	23.999*
34	23	7.299	7.394	-0.095	18.571	29.570*
35	22	-2.050	-4.951	2.902	18.173	34.968*
36	22	-4.565	-2.811	-1.754	10.719	31.112*

Table 6
The P/E and B/M of the IPOs before and after offerings

This table presents the P/E and B/M in the pre-offering, on the listing day, one year after listing, two years after listing and three years after listing. P/E is the earnings per share of the previous year divided by the closing price of the day that we are interested in. B/M is the book value of the previous year divided by the market value of the company on the day that we are interested in.

	A Share				B Share			
	IPOs Market		Whole Market		IPOs Market		Whole Market	
	P/E	B/M	P/E	B/M	P/E	B/M	P/E	B/M
Pre-offering	15.00		36.17	0.25	5.58		10.04	3.49
Listing day	34.65	0.24	37.39	0.25	6.02	3.49	9.72	3.52
One-year after listing	29.50	0.24	33.20	0.21	6.54	1.40	9.55	0.64
Two-years after listing	31.09	0.26	35.23	0.23	9.16	1.49	8.84	0.81
Three-years after listing	38.90	0.25	38.39	0.21	9.08	1.11	7.97	0.98

Table 7
Time-series regressions of monthly returns of IPO portfolio and non-IPO portfolio
on the Fama and French three factors

This table reports the results of the time-series regressions of monthly returns of IPO portfolio and non-IPO portfolio on the Fama and French three factors. A firm is included in the IPO portfolio if it issued new equity in the prior three years. R_{mt} is the return on the value-weighted index of the Shanghai Securities Exchange and the Shenzhen Stock Exchange in month t . R_{ft} is the three-month deposit interest rate which is a proxy for the risk-free rate. SMB_t is the return on small firms minus the return on big firms in month t ; and HML_t is the return on high book-to-market stock portfolio minus the return on the low book-to-market stock portfolio in month t . Diff is the difference between the return on the IPO portfolio and the non-IPO portfolio. The t-statistics are in parentheses. Each regression uses 83 monthly observations.

$$R_{pt} - R_{ft} = \alpha_0 + \alpha_1[R_{mt} - R_{ft}] + \alpha_2SMB_t + \alpha_3HML_t + \varepsilon_t$$

Panel A: Regression using Value-Weighted Portfolio Returns

	α_0	α_1	α_2	α_3	R ²
IPOs	-0.35	1.00	0.20	0.09	0.982
	(-1.24)	(51.42)	(3.82)	(2.62)	
Non-IPOs	-0.08	0.98	-0.11	0.04	0.996
	(-0.69)	(120.06)	(-4.80)	(2.84)	
Diff	-0.27	0.02	0.31	0.05	0.314
	(-0.73)	(0.81)	(4.43)	(1.09)	

Panel B: Regression using Equally Weighted Portfolio Returns

	α_0	α_1	α_2	α_3	R ²
IPOs	0.16	1.04	0.51	0.02	0.952
	(0.35)	(35.04)	(3.97)	(0.27)	
Non-IPOs	-0.12	0.97	0.47	0.04	0.983
	(-0.47)	(58.83)	(6.64)	(0.93)	
Diff	0.29	0.08	0.04	-0.02	0.101
	(0.72)	(3.07)	(0.36)	(-0.29)	

Table 8
The changes in operating performance of IPO firms surrounding the issuing year

This table presents the mean change/growth in operating performance of IPO firms during the period of 1993 to 1998. ROA is return on assets and is measured as the operating income before depreciation and amortization as a percentage of total assets. CFOA is the operating cash flow on assets and is defined as the operating income less capital expenditures. Sale_G is the growth rate of net sales. ATO is the asset turnover that is measured as net sales over total assets. CE is measured as the growth rate of capital expenditures compared with the year prior to IPOs. The industry-adjusted change/growth for a given firm is the deviation from the industry median. Year 0 is the fiscal year during which the firm goes public. ** and * indicate significance at the 5% and 10% levels, respectively.

Measure of Operating Performance	Year relative to the IPO year			
	From -1 to 0	From -1 to 1	From -1 to 2	From -1 to 3
Panel A: Operating Return on Assets (ROA)				
Mean Change (%)	-4.79**	-7.57**	-9.71**	-9.22**
Mean Industry-adjusted change (%)	-3.58**	-4.50**	-5.12**	-3.58**
Number of Observations	254	253	212	85
Panel B: Operating Cash Flows/Total Assets (CFOA)				
Mean Change (%)	-4.78**	-7.30**	-9.59**	-10.36**
Mean Industry-adjusted change (%)	-3.39**	-3.86**	-4.77**	-4.27**
Number of Observations	254	253	212	85
Panel C: Sales Growth Rate (Sale_G)				
Mean Change (%)	19.57**	51.96**	90.08**	169.06**
Mean Industry-adjusted change (%)	12.75**	40.53**	74.46**	152.34**
Number of Observations	343	342	299	132
Panel D: Asset Turnover (ATO)				
Mean Change (%)	-33.20**	-37.00**	-46.07**	-47.65**
Mean Industry-adjusted change (%)	-27.06**	-22.31**	-24.44**	-20.27**
Number of Observations	343	342	299	132
Panel E: Capital Expenditures Growth Rate (CE)				
Mean Change (%)	146.88**	250.99**	253.90**	37.29
Mean Industry-adjusted change (%)	136.44**	233.01**	243.47**	92.87**
Number of Observations	248	248	248	207

Table 9
Cross-sectional regressions of post-issuing stock returns on operating performance

This table reports the regression results of the post-issuing stock price performance on the post-issuing operating performance. The dependent variable is the one-year, two-year, and three-year stock abnormal returns following the IPOs. The independent variables are changes in industry-adjusted operating performance measures. ROA is return on assets and is measured as the operating income before depreciation and amortization as a percentage of total assets. CFOA is the operating cash flow on assets and is defined as the operating income less capital expenditures. Sale_G is the growth rate of net sales. ATO is the asset turnover that is measured as net sales over total assets. CE is measured as the growth rate of capital expenditures compared with the year prior to IPOs. The industry-adjusted change/growth for a given firm is the deviation from the industry median. ** and * indicate significance at the 5% and 10% levels, respectively.

Panel A: Regression results for one-year accumulative abnormal returns

Variable	Intercept	Δ ROA	Δ CFOA	Δ Sale_G	Δ ATO	Δ CE	\bar{R}^2
Coeff.	-3.949	1.014**					0.047
t-value	(-1.552)	(3.436)					
Coeff.	-3.972		1.105**				0.048
t-value	(-1.565)		(3.461)				
Coeff.	-10.497**			0.348**			0.142
t-value	(-4.770)			(6.264)			
Coeff.	-5.344*				0.083		0.010
t-value	(-1.889)				(1.555)		
Coeff.	-8.627**					0.006	0.001
t-value	(-3.075)					(0.491)	
Coeff.	-9.648**	0.602*		0.340**	-0.073	-0.005	0.157
t-value	(-3.113)	(1.908)		(5.478)	(-1.274)	(-0.456)	
Coeff.	-9.934**		0.702*	0.340**	-0.082	-0.004	0.159
t-value	(-3.244)		(1.992)	(5.472)	(-1.402)	(-0.345)	

Panel B: Regression results for two-year accumulative abnormal returns

Variable	Intercept	Δ ROA	Δ CFOA	Δ Sale_G	Δ ATO	Δ CE	\bar{R}^2
Coeff.	-0.953	1.687**					0.137
t-value	(-0.291)	(5.552)					
Coeff.	-1.995		1.768**				0.133
t-value	(-0.621)		(5.464)				
Coeff.	-13.005**			0.147**			0.116
t-value	(-4.235)			(5.042)			
Coeff.	-6.272*				0.107*		0.015
t-value	(-1.773)				(1.701)		
Coeff.	-12.012**					0.014**	0.032
t-value	(-3.616)					(2.515)	
Coeff.	-8.261**	1.354**		0.094**	-0.046	0.009*	0.199
t-value	(-2.117)	(4.138)		(2.806)	(-0.707)	(1.786)	
Coeff.	-9.376**		1.465**	0.095**	-0.056	0.010*	0.201
t-value	(-2.470)		(4.195)	(2.862)	(-0.867)	(1.920)	

Table 9 (continued)*Panel C: Regression results for two-year accumulative abnormal returns*

Variable	Intercept	Δ ROA	Δ CFOA	Δ Sale_G	Δ ATO	Δ CE	\bar{R}^2
Coeff.	-10.697*	0.552					0.010
t-value	(-1.848)	(0.797)					
Coeff.	-10.010*		0.719				0.015
t-value	(-1.701)		(0.996)				
Coeff.	-16.986**			0.156**			0.186
t-value	(-3.304)			(3.884)			
Coeff.	-11.476*				0.021		0.001
t-value	(-1.856)				(0.237)		
Coeff.	-17.305**					0.035**	0.077
t-value	(-3.012)					(2.353)	
Coeff.	-22.187**	0.168		0.153**	-0.082	0.022	0.230
t-value	(-3.555)	(0.251)		(3.441)	(-0.901)	(1.485)	
Coeff.	-21.728**		0.379	0.152	-0.091	0.022	0.233
t-value	(-3.462)		(0.537)	(3.420)	(-0.992)	(1.481)	



