State Ownership, Firm Size, and IPO Performance: Evidence from Chinese "A" Share Issues

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INTRODUCTION

Numerous studies have developed demonstrating the price behaviors of Initial Public Offerings of common stock (IPOs) in many countries. Some theories have been advanced to explain these phenomena of shortterm excess returns and long-term poor performance. Ritter (1984, 1991) finds high initial returns and long run poor performance of IPOs. Ibbotson, Sindelar and Ritter (1988) examine over 8,000 U.S. IPOs and find an average initial return of 16%. Loughran, Ritter and Rydqvist (1994) survey the literature on IPOs in 25 countries and find that the initial returns range from 4.2% in France to 80.3% in Malaysia. Chen (1992) analyzes 20 years of initial offerings in Taiwan and finds an average of 45% underpricing. Chau, Ciccotello and Grant (1994) study 72 IPOs in China in 1993 and find the average initial returns to be over 647%, which is significantly higher than any ever documented in financial research. They find that the returns are higher for smaller firms in smaller offerings and that the firms with mid-range levels of insider ownership have the highest returns. They explain that the reason for the extremely high initial returns in the Chinese "A" share market may be due to the lack of alternative investment opportunities. Miurin and Sommariva (1993) provide some evidence that Chinese savers had been forced to make negative real return investments prior to the opening of the stock markets. This may explain the strong demand for stocks. Reports about initial returns of IPOs in other developing countries include 78.5% in Brazil (Aggarwal, Leal and Hernadez, 1993), 78% and 58%, respectively in Korea (Dhatt, Kim, and Lim, 1993, and Kim, Krinsky, and Lee, 1993), 80.3% in Malaysia (Isa, 1993), and 58% in Thailand (Wethyavivorn and Koo-Smith, 1991).

Several theoretical explanations have been offered for the underpricing of IPOs. Baron (1982) believes that high initial returns are caused by an information asymmetry between the underwriters and the issuers. Tinic (1988) suggests that the underpricing provide some protection for the underwriters against possible lawsuits by disgruntled investors. Loughran, Ritter and Rydqvist (1994) offer an array of possible reasons for IPO underpricing, including "The Winner's Curse", "Dynamic Information Acquisition", "Information Cascades", "Reducing Legal Liability", "Enhancing Banker Relations with Investors," among others. Kunz and Aggarwal (1994) suggest that institutional lag may result in underpricing if the stock market is rising between the fixing of the offering price and the beginning of trading.

Previous studies report negative connection between firm size and short-term IPO returns. The researchers use equity size as a proxy for firm size, however, as equity size is a function of share valuation, it is subject to under or over pricing. If the small equity size is caused by severe underpricing, a high initial return would likely result, but not because of its small size. Previous studies also report that government portion of firm ownership is positively related to short-term IPO returns, this relation would not be true if investors trust market economy and distrust government controlled economy.

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The process of IPO in China represents privatization, for which investors cheered and the IPOs exhibit the highest initial and first-day returns documented in financial markets. In addition to revealing the short-term excess returns and long-term poor performance of the IPOs, this study focus on demonstrating how IPO returns are affected by such factors as the proportion of government ownership – the lower the government proportion, the higher the extent of privatization, the firm size, and the lack of alternative investment opportunities to the Chinese investors.

The Shanghai Stock Exchange (SHSE) officially opened on December 19, 1990 with four listed "A" shares. The trading of "B" shares started in February 1992 on the SHSE. The "A" shares are available only to domestic investors and are priced/traded in the Chinese currency, yuan. "B" shares were issued only to foreign investors (available to domestic investors since February 20, 2001) and are priced/traded in U.S. dollars on the SHSE. Both "A" and "B" shares carry the same voting rights and dividends, with "A" share dividends paid in Chinese yuan and "B" share dividends paid in U.S. dollars, adjusted for exchange rates. As of the end of 2001, there were about 597 "A" shares and 55 "B" shares listed on the SHSE, with a total market capitalization of 3,031 billion yuan (about 365 billion US dollars), of which "A" shares account for 2,961 billion yuan and 'B" shares 70?billion US dollars (*Shanghai Securities Daily*).[1]

The "A" shares were distributed through a lottery system because of the serious imbalance of supply and demand. Winners are selected via a random number generating scheme and are entitled to purchase (usually five hundred) shares at the issue price. As the demand for the new shares far exceeds the supply, only a small percentage of the subscriptions win the lottery. In some cases, the "hit rate" could be as low as 3 percent (Chau, Ciccotello, and Grant, 1996).

Evidence is shown that the average initial return [(first trade price-issue price)/issue price] of the IPOs in the sample is 217.2%, which is significantly higher than those reported from other markets. A pattern of decreasing average returns with time is detected: the average returns for first day, first month, first three-month, and first six-month are 214%, 203.7%, 133%, and 91.3%, respectively. The extraordinarily high short-term returns or underpricing in the Chinese IPO markets may be due to the lack of alternative investment instruments; excessive speculation, the lack of reliable accounting and financial information, and serious information asymmetry.

The long-term, up to five years returns on the Chinese IPOs are generally negative. Most of the after market share prices are lower than the initial, first-day, first-week, first-month, and first three-month prices.

Agency problem may be a major reason for the underpricing in China. The issuing firm's employees were allowed to purchase a significant portion of the initial offerings at the issue price. However, IPOs in China represent the process of transferring state ownership to individual investors, insiders of the issuing company had incentive to reap state wealth from the significant underpricing. Policies that would avoid such conflict of interest, promote privatization, stimulate employee performance, and encourage optimal IPO pricing are designed based on the results of this study.

The regression analysis reveals that the proportion of state ownership has a significantly negative connection to short-term IPO returns, this shows the market's distrust of government's involvement in business operations and represents confidence in the privatization of state enterprises. The analysis also indicates that firm size, approximated by total sales of the issue year, has a significant positive impact on the returns, which is contrary to what has been reported by previous studies. The positive relationship between returns and firm size indicates that investors believe that large companies are less risky hence have stronger demand for their stocks.

The data and the empirical methodology are described in Section II. The estimated returns, analyses of their determinants, and practical implications are presented in Section III. Section IV analyzes the relations between state ownership, firm size and short-term returns. Section IV concludes the paper.

II. DATA AND METHODOLOGY

This research includes 68 companies that went public in 1994 and were traded on the SHSE. Daily opening prices, closing prices and trading volumes are provided by the Shanghai Stock Exchange. Initial offering prices and the firms' ownership structures are from *Shanghai Securities Yearbook* and *A Comprehensive Review of Listed Companies*, published by Shanghai New Era Investment Consulting Corp. Most of the IPOs, 63 out of the 68, took place in the first five months in 1994. There were 4 IPOs in August and 1 in September. Table 1 provides the descriptive statistics of the data.

TABLE 1
Descriptive Statistics of the Data

	Sample Size	Mean	Standard Deviation	Minimum	Maximum
Issue Price	68	4.55	1.57	1.00	8.00
First Trade Price	68	12.14	5.18	4.10	26.98
State Portion	68	0.45	0.28	0.00	0.90
1994 Revenue (million yuan)	68	616.91	871.28	13.23	5457.82

Month	Jan.	Feb.	Mar.	Apr.	May	Aug.	Sept.
Number of Issues	21	17	12	7	6	4	1

The returns are computed and defined as follows:

Initial return = (first trade price - issue price)/issue price (1)
First day return = (first trade day closing price - issue price)/issue price (2)
First month return = (price after one month trading - issue price)/issue price (3)
First three month return = (price after three months trading - issue price)/issue price (4)
First six month return = (price after six months trading - issue price)/issue price (5)
Based on the individual firm's returns, average returns for different time periods are calculated as the equally weighted price changes from the issue price.
Market adjusted IPO returns for individual firms are computed and defined as follows:

$$\text{Adj. Return}_{i,n} = \text{Return}_{i,n} - \text{Index Return}_{n} \quad (6)$$

where,

$\text{Return}_{i,n}$ = the return on firm i after n period(s) of trading;
Index Return_{n} = the return on SSE "A" share index during the corresponding time period(s).
Based on the individual firm's market adjusted returns, average market adjusted returns for different time periods are calculated on an equally weighted basis.

III. SHORT-TERM AND LONG-TERM PERFORMANCE

3.1 High Initial and Short-term Returns

Extraordinarily high short-term returns are evidenced on the IPOs. The average initial return is 217 %. The largest initial return is 1580 % and the smallest is 19%. Figure 1 depicts the distribution of initial returns. There is a clear pattern of decreasing average returns over time. The first day returns average 214.15 %, ranging from 6.25% to 1869%. The average first month, first three-month and first six-month returns are 179.5%, 133%, and 91.3%, respectively. After six months of trading, only 7 firms' share prices are higher than their first day closing prices. Table 2 reports the short-term returns of the IPOs in various time periods.

To reflect the true returns of the IPOs, the market-adjusted returns for the firms over the time horizons are also estimated. The results are reported in Table 3. The market adjusted average returns are higher than the unadjusted returns for all the examined time horizons, suggesting that the high IPO returns are not caused by market movements. The market adjusted returns also decrease with time.

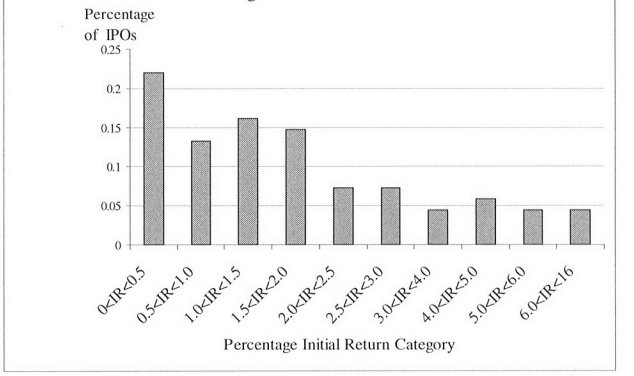
The average initial return of 217.2% in 1994 is significantly higher than those reported from other markets, but lower than the 647% reported by Chau, Ciccotello, and Grant (1996) in their study of 72 IPOs

TABLE 2
Short-term Returns of the IPOs

Returns	Mean	Standard Deviation	Min	Max	Higher than	Higher than
Initial	217%	239%	19%	1580%	Initial[1]	First day[2]
First Day	214	262	6	1869	25	
First Month	180	233	-19	1475	14	19
First 3-Month	133	201	-45	1310	8	9
First 6-Month	91	136	-48	790	5	7

1. Number of stocks who's respective returns are higher than its initial return.
2. Number of stocks who's respective returns are higher than its first day return.

FIGURE 1
Histogram of Initial Returns



in China in 1993. The initial returns in 1994 were lower than those in 1993, mainly due to a major regulation change. In early 1994, the government implemented new regulations prohibiting banks, state enterprises, and government officials from participating in stock market activities. Prior to the change, there

TABLE 3
Adjusted Short-term Returns of the IPOs

Returns	Mean	Standard Deviation	Min	Max	Higher than Initial[1]	Higher than First day[2]
First Day	222%	261%	8%	1873%	31	
First Month	194	232	9	1495	27	21
First 3-Month	159	200	-3	1371	11	11
First 6-Month	126	140	-9	822	6	6

1. Number of stocks who's respective returns are higher than its initial return.
2. Number of stocks who's respective returns are higher than its first day return

were wide spread anecdotal evidence that state-owned financial institutions and other state-owned companies were able to buy large number of shares at

the issue price on a regular basis, selling those shares on the first day of trade and making a quick, often huge, profit. These activities further exacerbated the shortage of new shares and contributed to the frenzy on the first day of trade. The new regulation eliminated these institutions from competing for new shares and may have reduced the initial returns from the 1993 level. In fact, it also contributed to the sharp down turn of the market in the first half of 1994.

The high IPO returns in China may have been caused by a combination of the following factors:

1). Pent-up demand for stocks due to the lack of investment opportunities

Before the establishment of stock markets in the early 1990s, bank deposits and Treasury bonds were the only investment instruments available to Chinese people. Miurin and Sommariva (1993) document that for Chinese savers, the real returns on bank deposits and Treasury bonds were actually negative due to the relatively high rates of inflation.Under the circumstances, stocks were the only instruments that could be expected to provide real returns. But the equity investment opportunities were scarce. At the end of 1994, the total market capitalization of the stock market was only 6.02% of the GDP, which was very low compared to 349.8% in Hong Kong, 89.2% in Taiwan and 107% in Thailand.[2] When investment opportunities are scarce, IPO shares probably provide the best opportunity to earn high returns quickly. However, due to the imbalance of supply and demand, only a small fraction of the interested investors who win the lottery are able to buy a small number of shares at the issue price, though investors would be willing to pay more for the shares. Once a new issue reaches the secondary market, the large number of unsuccessful bidders in the primary market are willing to pay high prices for the shares and therefore drive up the price.

The extraordinary demand for stocks may be a key factor affecting the IPO returns. The valuation method used for pricing the IPOs are the same for both the "A" shares and the "B" shares, but the short-term returns on the "B" shares are much lower. As Gu and Jin (1999) report, the average initial return is 9.36%, and the average first day return is 15.43%, respectively for "B" share IPOs from 1992 to 1996.

2). Bandwagon Effect

The bandwagon hypothesis (Ritter, 1997) suggests that investors do not base their investment decision exclusively on their own information about the new issue, but also on whether other investors are buying. They are more likely to buy if other investors are buying and sell if others are selling. This is the so called bandwagon effect and is used to explain why the issuers might be willing to underprice an issue to attract the first few investors and to induce more demand for the shares. Given the strong demand for new issues in China, it is doubtful that issuers would intentionally underprice the new issues for that purpose. However, bandwagon effects could be an important reason for the extremely high initial and first day returns. In China, market valuations are often not based on economic fundamentals but on market trends and investors' psychology because of the unavailability of reliable and standardized accounting and financial information. Investors often turn to their fellow investors for direction and their desire to purchase shares is reinforced by that of other investors, which causes an upward spiral.

The pent-up demand and bandwagon effect also contributes to the extremely high first day trading volume. For the IPO firms in our sample, the number of shares traded on the first day is about one third of the total shares outstanding. This indicates that about a third of the shares allocated at issue prices are sold on the first day for a huge profit. Thus the pent-up demand and bandwagon effect results in both extremely high trading volume and return on the first day of trade. As interest in the new issue wanes over time, volume plummets and share price stagnates. This is consistent to what has been observed in the Chinese market.

3). Agency Problem

The IPOs in China represent a process of transferring ownership from the government to individual investors. This is far different from IPOs in other markets, where the ownership typically transfers from one group of individuals to another. This typical situation in China is different from IPOs in economies of private ownership, and could cause very serious agency problems. As managers and other employees of the issuing companies are eligible to buy a portion of the initial offerings, they clearly have incentives to underprice the new issue for personal gains at the expense of the government.

3.2 Practical Implications

The fact that all the firms in our sample are underpriced suggests that the methods used to determine the issue prices are systematically biased. The state is not getting its fair value for the shares it sells. A possible solution to the agency problem discussed previously is not to allow employees of the issuing firm to purchase shares at issue price (not allowed now). Instead, employees should be allowed to buy a certain number of shares at the market price with some state subsidy as an incentive. The subsidy should be determined as a percentage of the lower of the issue price or of the first closing price. This subsidy would serve to promote employee performance, stimulate privatization, and encourage optimal IPO pricing.

Based on the results of this study, buying shares at

the issue price is a high-return, low-risk investment. For sellers, the best time is the first day of trade. For those who did not have the luck to buy at the issue price, the best strategy is to wait for at least several months. Buying those shares on the first trading day results in paying a premium.

3.3 Long-term Performance

Several studies have examined the returns on IPOs during the three years after going public for a number of countries (Kunz and Aggarwal, 1994, Loughran, Ritter, and Rydqvist, 1994). All of these authors equally-weight the IPOs in their respective samples and find poor performance. Similarly, the long-term, up to five years returns on the Chinese IPOs, as recorded in Table 4, are generally negative. Most of the after market share prices are lower than the initial, first-day, first-week, first-month, and first three-month prices though most of the share prices are higher than their issue prices or few of them exhibit negative returns over issue price (Penal A). For the raw returns (Penal B), for example, less than 4 or 6 percent of the 68 stocks had first anniversary prices higher than their initial prices, and less than 28 percent of the stocks had fifth anniversary prices higher than their initial prices. A similar performance exhibits when comparing the anniversary prices to the first close prices (Penal C), the first anniversary exhibits the lowest average rates of return and the lowest number and percentage (2 stocks, account for 2.9% of the total of 68 stocks) of stocks with positive returns. The poorest performance may be partially due to the general market. In the year of 1995, the market was weak and declined sharply during the fourth quarter. As shown in Chart 1, the 1995 year-end value of the index was below the lowest level of the fourth quarter of 1994. However, the index increased sharply during 1996 and the first quarter of 1997, and the values of the index were much higher than that of 1994 and 1995. Still, only 18 stocks or 26 percent of the stocks had fifth anniversary prices over their first-day close prices. And only 16 stocks or 24 percent of them had fifth anniversary prices over their first week prices. The negative return phenomenon is moderated when compared to the first three-month returns (not reported in the table).

Financial economists study both the returns and the effect of the market's performance on the returns though investors may pay more attention to the returns of their particular IPO investments. The market adjusted returns during the next five years is measured as

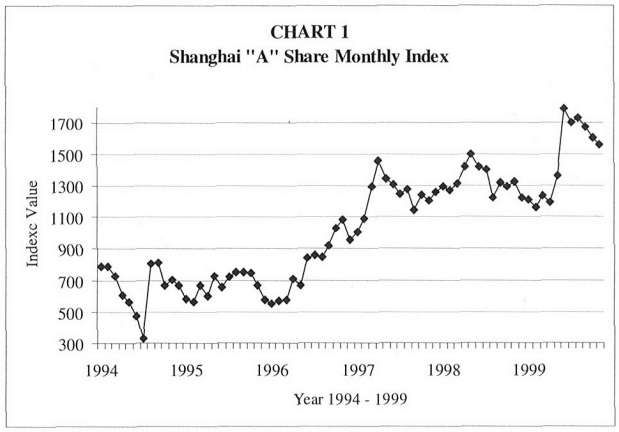
$$100\% * \left\{ \frac{\sum_{i=1}^{n}(1+R_{iT})}{\sum_{i=1}^{n}(1+R_{mT})} - 1 \right\} \qquad (7)$$

Where

TABLE 4
Long-term Performance

A) Returns compared to issue price					
Year end	Average	#Negative[1]	Percent	Minimum	Maximum
First	72%	19	27.9	-44%	700%
Second	130	6	8.8	-19	2185
Third	171	6	8.8	-30	3775
Fourth	143	9	13.2	-32	1525
Fifth	151	5	7.4	-29	1218
B) Compared to first trade price					
	Average	#Positive[2]	Percent[3]	Minimum	Maximum
First	-41	4	5.9	-70	25
Second	-25	11	16.2	-71	152
Third	-19	11	16.2	-71	258
Fourth	-20	14	20.6	-72	108
Fifth	-15	19	27.9	-75	100
C) Compared to 1st close price. Raw					
	Average	#Positive	Percent	Minimum	Maximum
First	-43	2	2.9	-76	15
Second	-27	11	16.2	-69	140
Third	-21	10	14.7	-68	241
Fourth	-22	12	17.6	-71	125
Fifth	-17	18	26.5	-71	100
D) Compared to 1st close price. *Adjusted*					
	Average	#Positive	Percent	Minimum	Maximum
First	-26	10	14.7	-67	55
Second	-43	5	7.4	-76	44
Third	-53	4	5.9	-81	116
Fourth	-52	2	2.9	-82	63
Fifth	-57	0	0.0	-83	-16

[1] Number of stocks showing negative returns.
[2] Number of stocks showing positive returns.
[3] Percent of the stocks showing the respective returns (e.g., 19/68 = 27.9%).



R_{iT} is the holding-period return from the closing price at the end of the initial return interval until the first through fifth anniversaries of the IPO, and R_{miT} is the holding-period return on the Shanghai "A" share index over the same holding period. The summations are over the observations. As shown in Penal D in Table 4, the averages of the adjusted after market performance during the next five years are all negative and much below that of the unadjusted performance. Except for the first year after the issue, the averages of the adjusted returns are all substantially lower than that of the raw returns. The number of stocks that experienced positive adjusted returns is also substantially smaller than that of the raw returns, and, none of the stocks' fifth year-end price exceeded its first close price.

Excess demand for the anti-inflation investment instrument, stocks, may be a explanation for such poor long term performance. As mentioned earlier, pent-up demand for stocks due to the lack of investment opportunities contributes to the highest short-term returns on the IPOs, the excess demand would result in stock prices higher than their value at the time, and thus lead to poor long-term performance.

IV. STATE OWNERSHIP, FIRM SIZE AND SHORT-TERM RETURNS

To explore the effect of privatization and firm size on the short-term returns of the IPOs, regression analyses are conducted with the returns as the dependent variables and measurements of state ownership and firm size as the independent variables. We use a cross-section, multiple variable model to determine the relationship between the short-term IPO returns and the proportion of government ownership and the firm size. The regression model is as follows:

$$Return_n = \alpha + \beta_1\ State\ portion + \beta_2\ Issue\ year\ revenue \quad (8)$$

where,

$Return_n$ = The average rate of return of the IPO firms after n periods of trading.

State portion = The proportion of shares owned by the government at the time of IPO. It ranges from 0% to 90%, averaging 45%. The variable is used to test the market's response to government ownership.

Issue year revenue = The total revenue of the firm in 1994. It is used as a proxy for firm size. Large firms are typically viewed as less risky and receive more press coverage. We believe revenue is a better measure for firm size in this case as it is independent of the stock valuation. Equity size is a function of share price and is affected by the over or under pricing of the shares and therefore is not a good proxy for our purpose.

The results are reported in Table 5. The results indicate that short-term IPO returns are negatively connected to the proportion of state ownership, or the greater the proportion of government ownership, the lower the returns. The coefficients are significant at 10% level when regressed against the initial, first day, and first three-month returns and at 5% level for the first six-month returns. Proportion of state ownership reflects extent of privatization, greater proportion of state ownership represents less privatization. The negative connection between the returns and government ownership also reflects the view of investors concerning government ownership. Investors distrust too much government involvement in business operations, they show their confidence for the privatization of state enterprises as they anticipate greater improvement in managerial efficiency. The relatively low short-term return on IPOs with more government shares show that these stocks attract less demand by the investors, even though larger portion of government ownership reflects smaller supply of the shares. In fact, most of the state-owned companies have been losing money for years and are widely believed to be inefficient. The private sector, on the other hand, has been booming since the economic reforms started in early 1980s and has largely contributed to one of the world's highest economic growth rates in the last 10 years.

The coefficients for firm size are all positive. They are significant at 10% level for the initial returns and at 5% level for the first day and first three-month returns. It is not significant for the first six-month returns. These results indicate that, in general, firm size has a positive impact on the returns. Investors are risk averse and have more confidence in large companies since large companies are usually believed to be less risky and have more information available to investors, which also reduces risk. Hence investors are willing to pay a premium for shares of large companies and accept lower expected return for assuming less risk. However, the results are inconsistent with those reported by early researchers, e.g., Chau, Ciccotello and Grant (1996). Using equity size as a proxy for firm size, they find that firm size is negatively related to returns. The reason for the difference may be due to the differ-

TABLE 5
Impacts of State Ownership and Firm Size on the Returns

Dependent Variables	Intercept	State Portion	Issue Year Revenue	F-Value [Significance]	R-Square
Initial Return	2.4640	-1.4017	4.9747	1.9099	0.06
	(4.31)	(-1.34)*	(1.51)*	[0.16]	
First Day	2.3515	-1.5309	7.2363	2.7900	0.08
	(3.79)	(-1.36)*	(2.02)**	[0.07]	
First Month	1.9694	-1.1743	5.3274	1.9118	0.06
	(3.53)	(-1.15)	(1.65)*	[0.16]	
First 3-Month	1.6000	-1.3104	4.8740	2.5344	0.07
	(3.36)	(-1.51)*	(1.77)**	[0.09]	
First 6-Month	1.3619	-1.3486	2.1971	3.2841	0.09
	(4.31)	(-2.34)**	(1.21)	[0.04]	

(T-values in parentheses)
* Significant at the 90% level
** Significant at the 95% level

ent proxies used. As equity size is a function of share valuation, it is subject to under or over pricing. If the small equity size is caused by severe underpricing, a high initial return would likely result, but not because of its small size. For example, if a firm's shares are significantly underpriced at the time of issue, the equity size will be small. If the market believes that the shares are significantly underpriced, the initial and first day returns will be high. But this does not necessarily mean that smaller firms generate higher initial returns. Hence, total annual sales may be a better measure for firm size for our purpose since it is independent of share valuation.

V. CONCLUSION

The Chinese IPOs of 1994 demonstrate extremely high short-term returns, decreasing returns over time and poor long-term performance. The extraordinarily high shot-term returns are caused by the lack of alternative investment opportunities, the "bandwagon effect," and the agency problem. Regulatory changes also affect the IPO returns.

State ownership is significantly negatively connected to initial and first-day returns because of market's distrust of government involvement in business operations. The positive relation between firm size and initial and first-day returns is contrary to previous reports. The reason for this contrary may be due to the previous researchers' use of equity size as a proxy for firm size, which is a function of share valuation and is subject to under or over pricing.

The practical implication of this study is that the IPOs in China are systematically underpriced. Purchasing shares at the issue price is a lucrative investment and brings extremely high returns at the expense of the whole society, since the issuer is the government who is not getting the fair share for the society. To eliminate the conflict of interest, the government should stop allowing insiders to buy shares at the issue price. Instead, the government might provide a subsidy to the employees who buy a specified number of shares at the market price. The subsidy should be designed as a percentage of the lower of the issue price or of the first closing price. This subsidy would serve to promote privatization, stimulate employee performance, and encourage optimal IPO pricing.

NOTES

[1] Shanghai Securities Yearbook 1995.

[2] Data source: Emerging Stock Markets Factbook, 1995. International Finance Corporation.

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