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Share Issuing Privatizations in China: Determinants of Public Share Allocation and Underpricing

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Share Issuing Privatizations in China:
Determinants of Public Share Allocation and Underpricing

by

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Share Issuing Privatizations in China: Determinants of Public Share Allocation and Underpricing

Abstract:

Using data on 451 Chinese privatizations over the period 1994-2002, this paper empirically investigates the firm and stock market characteristics that determine the size of the portion of new shares sold to the general public and underpricing at SIP-time. We find that poor performance and financing constraints, reflected by a low profitability and high leverage, mainly drive public share allocation. Also, the government widens ownership to a larger extent in firms that receive substantial subsidies. By contrast, stock market returns pre-SIP and variables capturing the firm's growth opportunities do not positively affect public share allocation. Yet, in firms with a low market-to-book ratio, the government is more likely to relinquish its majority stake at SIP-time. The determinants of underpricing further illustrate the uniqueness of SIPs compared to private-firm IPOs. Overall, there is little evidence that information asymmetries regarding firm value influence first-day returns whereas stock market conditions have an impact. After accounting for the endogeneity of the public share allocation decision, we find that the fraction of ownership divested is significantly positively related to underpricing.

Keywords: privatization; motives for going public; government divestment; underpricing

JEL: G32, G38

1. Introduction

Ever since Britain's Thatcher government launched a large-scale privatization program in the early 1980s, privatization has expanded across developed as well as developing countries. According to Megginson and Netter (2001), by the end of 1999, the cumulative proceeds raised by privatizing governments worldwide has exceeded 1 trillion US dollars and 12 out of the 15 largest IPOs ever conducted were privatization IPOs (PIPOs). In addition, Kikeri and Kolo (2005) document that during the last decade especially developing countries have initiated massive privatizations; they find that over the period 1990-2003, the 120 developing countries in their sample implemented 7860 privatization transactions, which generated proceeds of nearly 410 billion US dollars.

This paper studies privatizations in China. The importance of the Chinese economy in the world has become more visible with China's entry into the World Trade Organization (WTO) in 2001 and its astounding economic growth rates in recent years. China has become the second largest economy in the world on a purchasing power basis only after the US and is also the second largest FDI recipient country in the world (World Investment Report, 2005). Under the policy of privatizing all but the largest and strategically important state-owned enterprises (SOEs), privatization has had a significant impact on the Chinese economic landscape. The first (partial) privatization occurred in 1984, when the government permitted a department store in Beijing to sell shares to its employees. In 1990, 10 companies became listed through a share issuing privatization for the first time. A share issuing privatization (SIP) is hereby defined as a public offering of common stock by a firm with government ownership (e.g., Dewenter and Malatesta, 1997; Jones *et al.*, 1999). This study focuses on initial SIPs, where firms are introduced on the domestic capital market rather than abroad. In fact, the stock exchanges of

Shanghai and Shenzhen were established in 1990 and 1991, respectively to facilitate future SIPs. By the end of 2003, more than 1000 state-owned enterprises of middle and large size have been privatized, through listing some of their shares on these two national exchanges. These firms represent about 93% of all publicly quoted firms in China. This is not surprising as the first private-firm IPO took place only in 2000. Besides, a lot of small firms have been sold off through private auctions. As of 2000, China has emerged as the most important privatizing country, accounting for more than 20% of worldwide privatization proceeds (Kikeri and Kolo, 2005). Also, as the Chinese government plans to further privatize a large number of the remaining SOEs and divest some of its remaining stake in firms already publicly quoted, a study that examines privatizations in China likely is relevant and timely.¹

Given the importance of privatization, both in terms of number of firms involved and impact on the economy,² many studies have explored the macro-economic determinants underlying privatization across countries and its impact on the performance of newly privatized firms (e.g., Sappington and Stiglitz, 1987; Shleifer, 1998; Megginson *et al.*, 1994; Boubakri and Cosset, 1998; Gupta, 2005). Only a few recent articles have examined the event of privatization itself, investigating the determinants of the choice between different privatization methods (e.g., the decision to list SOEs abroad in Bortolotti *et al.* (2000) and the choice between SIP versus private auction in Megginson *et al.* (2004)) and the terms adopted by governments (Jones *et al.* (1999), for example, investigate how political and economic factors affect whether the

¹ In June 2005, for example, the Chinese government approved that 46 publicly quoted firms will be allowed to have their non-tradable shares circulating in the near future; this approval can be considered as an important move to pave the road for further sales of state shares within these firms.

² As an example, the state's economic role in China declined dramatically from 80 percent of GDP in 1978 to only 17 percent in 2003. However, SOEs remain a dominant economic force, employing half of China's 750 million workers, controlling 57% of its industrial assets and dominating key industries such as financial services, power, and telecommunications (McKinsey Quarterly, October 2004).

government favors one group of potential investors over another and underpricing). Our paper fills this void by examining the firm and stock market variables that affect public share allocation and underpricing in SIPs, using firm-level data on 451 Chinese privatizations during 1994-2002. As we argue later on in this paper, an important feature of Chinese SIPs is that they are partial in nature and mainly involve the sale of primary, i.e. newly issued shares at SIP-time.

Up till now, studies on the privatization process in China are limited in number as well as scope. Actually, most studies examine underpricing in the Chinese domestic stock market. Mok and Hui (1998), Chan *et al.* (2004), Chen *et al.* (2004) and Su (2004a, b) shed some light on the determinants of underpricing in Chinese IPOs, which in fact are SIPs. They conclude that variables capturing information asymmetries have some influence on underpricing in the Chinese stock market. Specifically, they find that firm age and size reduce whereas the time lag between share offering and listing increases first-day return. By contrast, Su (2004a) finds that leverage increases underpricing in the Chinese stock market. As far as the relation between ownership retained by the initial owner (the government) and underpricing is concerned, these studies find conflicting results. Mok and Hui (1998) and Chan *et al.* (2004), for example, find that retained state ownership has a significantly negative impact whereas Chen *et al.* (2004) document a significantly positive relation with underpricing. Also, while Mok and Hui (1998) and Chan *et al.* (2004) find the same sign, they interpret their results differently. Our study examines underpricing in a more elaborated model based on the IPO literature, using a more clear definition of government ownership. Also, our sample includes data on more recent transactions and takes the endogenous nature of public share allocation into account.³

³ By contrast, Mok and Hui (1998) examine a sample of 87 A share IPOs during the period 1990-1993 whereas Chen *et al.* (2004) use data on 701 A share IPOs in 1992-1997 and Chan *et al.* (2004) cover 570 A share IPOs over 1993-1998. Finally, Su (2004a) studies 348 IPOs between 1994 and 1999 whereas Su (2004b) examines 587 IPOs

Only a few studies on Chinese SIPs have looked at the determinants of changes in government ownership, which essentially was a byproduct of their analysis. Tian (2001) and Sun and Tong (2003), for example, examine the financial and operating performance changes of Chinese SOEs that are (partially) privatized through an SIP during 1994-1998 and thereby take into account that the decision to privatize may be related to the firm's prior performance. Specifically, Tian regresses the change in government ownership at SIP-time on the firm's ROA in the preceding year and industry dummy variables whereas Sun and Tong regress the proportion of state ownership upon public listing and the three-year average of this variable after SIP, respectively on the three-year average ROS before privatization, leverage, firm size and industry dummy variables. While Sun and Tong find that the Chinese government retains more shares in larger, highly levered companies, both studies fail to find a significant relation between pre-SIP profitability and government divestment. Also, the model fit in both studies is rather limited. Specifically, the explanatory power of Tian's (2001) model amounts to 14.5% whereas this percentage is only 2% in the study of Sun and Tong (2003).

Overall, the literature up till now has considered the SIP decision process in China to be a black box, claiming that the selection of SOEs for listing is rarely based on economic merit, attractiveness to investors, or the need of capital (e.g., Wei *et al.*, 2005). Rather, these studies allege that the SIP decision process is highly politicized and driven by quota systems. This study therefore investigates the determinants of public share allocation in a more elaborated model, starting from the main theories on going public. Specifically, we examine the fraction of (new) shares sold to the general public at SIP-time. As far as we know, there is no comparable empirical study in the privatization literature yet. Our research, as a result, will also shed some

light on *why* the government chooses to privatize SOEs. In addition, our findings may help to explain why SIPs in China so far are only of limited success, despite the country's high economic growth. Many studies indeed show that the financial and operating performance of SOEs in China deteriorates after their SIP (e.g., Sun and Tong, 2003; Quan and Huyghebaert, 2004). Furthermore, as of 2000, the Chinese domestic stock markets have endured a serious price fall, whereby more than half of the market capitalization was destroyed. The results from this analysis allow us to subsequently examine in more detail the relation between changes in state ownership and underpricing. As we argued before, the results on this relation are not consistent throughout the literature and different explanations have been offered. Our study is the first to take the endogeneity of the public share allocation decision process into account when examining underpricing in Chinese SIPs.

Using data on 451 Chinese privatizations over the period 1994-2002, we find that poor performance and financing constraints are the main forces determining the portion of new shares sold to the general public at SIP-time. Specifically, the government tends to issue more shares in firms with limited internal cash generation and high leverage. Also, the government widens ownership to a larger extent in SOEs that receive substantial subsidies. Public share allocation is not positively affected by the market-to-book ratio nor by other variables capturing the firm's growth opportunities, such as the SOE's pre-SIP sales growth, asset growth and capital expenditures. So, we find no evidence that the raised equity is needed to finance the SOE's current growth opportunities. The stock market return pre-SIP is not significantly related to the fraction of shares sold whereas a clustering of SIPs in the previous year has a positive impact. Finally, the results show that the government is cautious in privatizing large SOEs in regulated industries as these features negatively affect the allocation of shares to the general public.

In a second model, we examine the likelihood that the Chinese government reduces its ownership stake below 50% at SIP-time. The data show that the government is more likely to relinquish its majority stake in smaller firms receiving substantial subsidies and those with a low market-to-book ratio.

In sum, these results suggest that the government opens ownership to a larger extent in poor-performing SOEs, which is pointed out by their low profitability, highly accumulated debt ratios, reliance on government subsidies and limited growth prospects. Yet, we also show that the motives for privatizing Chinese SOEs likely have evolved over time. The results suggest that the Chinese government mainly introduced firms that benefited from a too relaxed (government) financing during the early years of its privatization program. For these firms, which were highly levered and consumed substantial subsidies, the government welcomed the stock market as an alternative financing source. Consistent with these arguments is the finding of Su and Fleisher (1999) that over 90% of Chinese newly privatized firms listed before June 1994 execute seasoned equity offerings within a short period after their SIP. In later years, the Chinese government opens ownership to a larger extent in firms with inferior profitability and limited growth prospects. These findings suggest that recently, the government has started to value the market disciplining function of a stock market quotation in an attempt to improve SOE performance.

Finally, we study underpricing in the context of Chinese SIPs, thereby taking into account the endogeneity of the public share allocation process. Overall, the determinants of underpricing further illustrate the uniqueness of SIPs compared to private-firm IPOs. First, there is little evidence that information asymmetries regarding the value of the SOE's assets influence first-day returns. Specifically, we find no relation between firm size and leverage and

underpricing whereas the market-to-book ratio has a significantly negative impact. Yet, consistent with earlier studies on Chinese SIPs, a long time lag between share offering and listing is found to be a source of uncertainty as this variable is positively related to first-day returns. We also demonstrate that over time the government has succeeded shortening this period, from which it has benefited under the form of lower underpricing. Consistent with the IPO literature, first-day returns are significantly larger during booming stock markets whereas share pre-allocation to institutional investors is found to reduce underpricing. Finally, we find that the fraction of ownership divested is not significantly related to underpricing whereas this variable has a positive impact after taking into account that allocation and pricing likely are determined simultaneously. Overall, these findings support the model of Perotti (1995) that governments may use underpricing as a mechanism to facilitate privatizations. Consistent with the model of Biais and Perotti (2002) is that the SIP is underpriced more when shares are also allocated to foreign investors in a prior offering on the B share market. In sum, these results demonstrate that uncertainty regarding the government's commitment to privatization rather than firm value as in private-firm IPOs is a major determinant of underpricing in SIPs.

The remainder of the paper is organized as follows. Section 2 provides a brief introduction on privatization in China. Section 3 develops hypotheses from the theories on the motives for going public and underpricing. Section 4 discusses the sample selection criteria and presents some descriptive statistics. Section 5 investigates the determinants of public share allocation and underpricing in Chinese SIPs. Section 6 concludes this paper.

2. Privatizations in China

The various stages in China's SOE reform, which officially began with the third Plenum of the eleventh Central Committee of the Communist Party of China (CPC) in December 1978, have been described in detail by Sun and Tong (2003) and Quan and Huyghebaert (2004). Overall, the reform in China has proceeded without complete market liberalization or democratization, which makes it rather unique compared to other mass privatization programs in the former communist economies of Eastern Europe and the Soviet Union. Hereafter, we discuss two distinctive features of the Chinese privatization process that are relevant for our study. First, nearly all SIPs in China so far are partial ones, where new financing is raised for the SOE and the government retains a large stake in most firms, even up to five years after their privatization (Quan and Huyghebaert, 2004). Thereafter, we elaborate on the unique mixed ownership structure in newly privatized firms.

While all of the SOE is commonly sold in an asset sale, SIPs are generally characterized by partial offerings.⁴ The reason why the Chinese government retains a large stake at SIP is that it assigns priority to reforming its SOEs into modern corporations through *widening* their ownership structure, rather than radically changing the nature of ownership. Bolton (1995), for example, argues that the Chinese government's strategy of reforming state-owned enterprises is to encourage competition in product markets and improve the firms' governance structure through opening their ownership structure. According to Jefferson (1998), such a policy may be defensible in the absence of well-functioning property rights markets as otherwise privatization could result in the transfer of public assets to private agents who do not use them more efficiently

⁴ In their 59 country sample of 630 SIPs, Jones *et al.* (1999) report that only 11.5% of the SIPs involved the sale of the entire SOE whereas in only 28.9% of the cases more than 50% of the SOE's shares were sold at the initial SIP.

than under state ownership.⁵ Furthermore, under a socialist ideology, the Chinese government fears that a rapid and massive privatization might lead to the loss of state-owned assets. Actually, the Chinese government never uses the term *privatization* in reference to the ownership reform of its SOEs, but rather speaks of *corporatization* (Wei *et al.*, 2005). Also, Sun and Tong (2003) argue that there is not even a single listed former SOE where the government has fully divested its stake. One could question whether such partial privatizations actually have any impact on the firms involved, especially when the government continues to control former SOEs. Gupta (2005), however, argues that most privatization programs begin with a period of partial privatization, where only non-controlling shares are sold on the stock market. His results show that even such partial privatizations significantly influence profitability, labor productivity and investment spending, which makes studying these events relevant.

Unlike the SIPs studied by Megginson *et al.* (1994) and Jones *et al.* (1999), the Chinese government does not explicitly sell shares through a secondary offering at the time of the SIP, but rather raises new equity for the SOE through a primary offering. Chinese SIPs thus increase the SOE's asset and equity accounts by the same amount, but also change the firm's ownership structure to some extent. As a result of the SIP, a new category of shares – A shares – arises. These share are exclusively available to Chinese citizens and domestic institutions;^{6,7} they are

⁵ Yet, partial privatization may still be desirable when it contributes to the SOE's monitoring.

⁶ It is required by Chinese corporate law that tradable A shares account for at least 25% of total shares outstanding when a company goes public. However, when the book value of equity exceeds 400,000,000 RMB (approximately €40,000,000), tradable A shares should represent only 15% of total shares outstanding. Chinese practice learns that these rules were not strictly followed in the early years of the privatization program.

⁷ End 2002, the A share market has been opened to some extent to foreign investors. Specifically, the CSRC and the People's Bank of China jointly announced that foreign institutional investors could apply to become qualified investors, QFII. Once approved by market regulators, QFII will be permitted to conduct limited investments in the A share market; overall, the stake of QFII cannot exceed 10% of the shares in any single Chinese firm. However, as we examine SIPs during 1994-2002, this issue is not relevant for our study and we can consider investors in the A share market to be Chinese domestic investors.

mostly held and traded by individuals, however (Sun and Tong, 2003). By contrast, the state shares retained by the Chinese central and local governments after the firm has been listed (is being privatized) cannot be traded freely in the secondary market.⁸ Besides, firms may also have legal person shares outstanding before SIP, which are the result of historical ownership reforms and equity-for-debt swaps. Legal person shares – which are also non-tradable in the secondary market – are owned by domestic institutions. These include stock-holding companies, non-bank financial institutions, and SOEs that have at least one non-state owner acting as co-founder or fund provider of the firm under consideration.⁹ Typically, a legal person is a large blockholder in only one or a few companies. Legal persons can divest their investment by selling the shares to other legal persons, after getting approval from the CSRC (Central Securities Regulatory Commission). Finally, some SOEs issue non-tradable employee shares¹⁰ and/or tradable B, H or N shares that are exclusive to foreign investors.¹¹ B shares are listed on the two national exchanges, with those listed on the Shanghai stock exchange (SHSE) denominated in US dollars

⁸ However, the percentage of state shares in a firm's total number of shares outstanding may decrease during the years after SIP when the government chooses to sell its shares to other institutional investors in a private transaction, when the government allows firms to increase their free float, or when it takes cash dividends instead of stock dividends. Although all shareholders now enjoy the same rights according to Chinese law, the state shareholder can sometimes choose between a cash dividend and a stock dividend.

⁹ Among legal person shares, there is one category of "state-owned legal person shares", which are held by a parent or other firm designated to look after the government's interests. The distinction between state shares and state-owned legal person shares is not so clear, especially not in the early years of the Chinese privatization process. As a matter of fact, state shares and state-owned legal person shares are sometimes classified under the same category of "state-owned shares". Therefore, in this study we categorize state-owned legal person shares as government shares. The classification is important as Sun and Tong (2003) find that remaining state ownership negatively impacts upon post-SIP performance whereas legal persons have a positive impact, which suggests that legal persons behave differently from the government.

¹⁰ On average, employee shares account for less than 2% of total shares outstanding and act purely as an incentive scheme rather than providing ownership control. These shares generally become tradable after a lock-up period, which usually lasts for six to twelve months after the SIP. Once sold on the market, these shares become ordinary A shares.

¹¹ To be noted, Chinese domestic investors who have foreign currency accounts with their brokerage firm have been allowed to trade B shares since June 2001.

whereas those listed on the Shenzhen stock exchange (SZSE) denominated in Hong Kong dollars. H shares are listed on the Hong Kong stock exchange. Up to the end of 2003, 111 firms have issued B shares and 90 firms have issued H shares. The number of firms listing N shares on the New York stock exchange remains quite limited.

At the end of 2003, about two-thirds of total shares outstanding in publicly quoted firms remain non-tradable, of which state shares and state-owned legal person shares represent nearly 80% (Financial Times, March 29, 2005). As a result, it is impossible to obtain a majority stake in most firms through purchasing their shares in the secondary market. So, the importance of non-tradable shares in a typical listed firm is likely to hamper the market disciplining function and could even distort the pricing of shares. As a result, since 2001 the Chinese government has invited professionals – including scholars and practitioners – to submit feasible proposals to realize the full circulation of part or even all of the non-tradable state and legal person shares in listed firms. The expectation of a massive supply of former non-tradable shares has led to huge market panic among investors and has sent both the Shanghai and Shenzhen stock market to historically low prices (see Figure 1). Even though the specific timetable for the reform is not settled yet, the Chinese government has published milestone guidelines in April 2005. In a first step, 46 listed firms have been selected as experimental firms to initiate the reform (see also footnote 1).¹²

Insert Figure 1

3. Theory and Hypotheses

¹² In these firms, the owners of non-tradable shares now have to negotiate with the owners of tradable shares for a feasible plan, which mainly concerns a compensation in shares or cash for the latter shareholders. Thereafter, the non-tradable shares will become tradable, subject to some constraints. In particular, shares sold should not exceed 5% (and 10%) of total shares outstanding within 12 (and 24) months after the expiration of the lock-up period. Also,

When a government sells (part of) an SOE via an SIP, it confronts allocation and pricing decisions similar to those faced by owners in private-firm IPOs. In this section, we therefore derive hypotheses on the determinants of public share allocation and underpricing in SIPs, starting from the main theories on the motives for going public and underpricing.¹³ Thereby, we pay special attention to how the differences between an SIP and a private-firm IPO could impact the empirical predictions. Also, as mentioned above, unlike the privatizations in most other countries, SIPs in China generally are pure primary offerings, whereby new equity is raised for the SOE. Although the government does not explicitly sell its own shares in such a transaction, an SIP inevitably leads to the dilution of government ownership in the newly privatized firm. We therefore believe that the extent to which shares are sold to the general public may reflect the government's motives to raise new equity for the SOE as well as its intentions to diversify the firm's ownership structure. This approach has also been followed in the empirical IPO literature, where IPOs in the US are largely pure primary offerings (e.g., Habib and Ljungqvist, 2001). Table 1 summarizes our hypotheses.

3.1. Share Allocation to the General Public

Regarding the public share allocation process, we are interested in two major decisions taken by the Chinese government. First, what firm and stock market characteristics influence the fraction of shares sold to the general public in an SIP. Second, under what conditions does the government relinquish its majority stake in the SOE and thus may actually allow for a control transfer. The literature typically classifies the latter type of privatization as *control privatization*

whenever the sold shares account for 1% of total shares outstanding, a public announcement is required.

¹³ We focus on theories and hypotheses that are most relevant to our purpose of deriving potential determinants of the public share allocation and underpricing in SIPs.

rather than *revenue privatization*. To be noted, the government does not necessarily lose control when its ownership is reduced below 50% as it may remain the largest shareholder. But we do believe there is a more radical ownership change in firms where the government gives up its majority stake. In support of our conjecture, Sun and Tong (2003) demonstrate that the changes in performance post-SIP are much better for firms where the government ends up with less than 50% of the shares outstanding whereas Jones *et al.* (1999) find that when a majority of an SOE is sold at SIP, investors require less underpricing. We use the same variables, which are discussed hereafter, to examine these two research questions.

3.1.1. Overcoming Financing Constraints

As indicated by several studies on the motives for going public (e.g., Pagano *et al.*, 1998; Huyghebaert and Van Hulle, 2005), overcoming financing constraints is an important reason why firms choose to go public. According to Myers and Majluf's (1984) pecking order theory, raising new equity is a final financing resort for firms that do not have enough internal cash generation and/or have reached their debt borrowing limits. Two implications are associated with this hypothesis. First, firms with a low current profitability may raise a larger percentage of new equity when going public. Second, firms with a high debt ratio may reduce their leverage by raising more equity at IPO-time. Pagano *et al.* (1998) indeed find that the new equity raised by Italian IPOs during the 1982-1992 period is mainly used to reduce leverage. Huyghebaert and Van Hulle (2005), in their sample of Belgian IPOs over 1984-2000, find that the size of the primary offering is negatively related to the firm's profitability, although they find no relation with leverage.

The motive of raising new equity likely is also important for firms with significant

investment opportunities. When the owners of high-growth firms are unable or unwilling to invest more of their own wealth in the firm, they may decide to raise new equity in a public offering to finance the firm's growth opportunities. Consistent with this idea, Pagano *et al.* (1998) find that firms in industries with high market-to-book ratios are more likely to go public whereas Huyghebaert and Van Hulle (2005) find that a firm's market-to-book ratio at IPO-time positively affects the portion of new equity. Furthermore, younger and smaller firms raise a significantly larger fraction of primary shares at IPO-time.

The issue of overcoming financing constraints may also apply in the context of SIPs. Given the low profitability and high debt ratios of most SOEs (e.g., Wu, 1997; Sun and Song, 2003),¹⁴ raising equity in public capital markets may be an alternative to debt financing so that leverage can be reduced. Since the corporate bond market almost does not exist in China, bank loans are an important component of debt financing. As pointed out by Gao and Shaffer (1998), bank loans in badly performing SOEs have been a major form of soft budget constraints in China. Not surprisingly, non-performing loans in state-owned banks are a serious problem in China (Sun, 2004). Consequently, the Chinese government may dislike investing more funds because of budgetary reasons rather than because of diversification considerations as in private-firm IPOs. This issue has become especially important with China's entry into WTO; the membership status obliges the Chinese government to further reduce its market disturbing support to local firms (Qin, 2004). To examine whether the nature of the debt influences the SIP decision, we include the proportion of debt that consists of bank loans as an additional explanatory variable and expect it to be positively related to the percentage of shares sold to the

¹⁴ The average debt ratio of state-owned enterprises in China was as high as 67.9% in 1994 and 65.1% in 1996 (Wu, 1997). Also, Sun and Tong (2003) report that debt exceeds total assets in 27.6% of the SOEs in 1994. In our sample, however, we find that the average (median) debt ratio amounts to 53.45% (56.98%) before SIP, which is somewhat

general public. Finally, we include the ratio of subsidies to total sales as an additional proxy for the firm's reliance on the government for funding and expect a positive relation with public share allocation when the government uses the SIP as an alternative financing source.

3.1.2. Promoting Financial and Operating Performance

The privatization literature so far has agreed that one of the most important motives for privatization lies in the disappointing financial and operating performance of state-owned enterprises. The inability of the government to effectively monitor the SOE's management and the inefficiencies caused by government interference in the firm's operations have led governments to divest their stake in SOEs worldwide (Shleifer, 1998; Megginson and Netter, 2001). We therefore expect a larger allocation of shares to the general public in firms with poor financial and operating performance pre-SIP. The objective to promote financial and operating efficiency in state-owned firms makes an SIP somewhat different from a private-firm IPO.

Based on a study of privatization motives for 683 Chinese SOEs over the period 1995-2001, Guo and Yao (2005) find no significant relation between the likelihood of privatization and inefficiencies measured by ROA as well as the gross profitability gap (value added divided by total assets) between the SOE and the average private firm in the corresponding industry. Also, as mentioned before, Tian (2001) and Sun and Tong (2003) fail to find any significant relation between pre-SIP profitability and government divestment. In this study, we will proxy the firm's financial performance by ROA. Unfortunately, we do not have data on the number of employees nor on wages paid to calculate the variables most commonly used in the literature to determine the SOE's efficiency (i.e., real sales per employee or net

smaller but still important.

income per employee). This study therefore measures the firm's operating efficiency by means of the ratio of administrative expenses to total sales and the ratio of administrative plus operating expenses to total sales.

3.1.3. Windows of Opportunity

According to the IPO literature, the intent of capturing windows of opportunity is an important determinant of the decision to go public (e.g., Ritter, 1991). Also, firms may issue more shares in times of good market assessment or when there is a clustering of IPOs, which induces information spillovers (e.g., Booth and Chua, 1996; Van Bommel, 2002). Huyghebaert and Van Hulle (2005), however, find that prevailing market conditions do not directly affect the portion of primary shares sold at IPO-time. In their sample, firms may wish to establish a reputation of good behavior vis-à-vis investors as a lot of them plan to go back to the stock market after their IPO. This may not be particularly true for state-owned enterprises, for instance when the SIP is considered mainly as a mechanism to impose market discipline on a firm's management through stock prices rather than as a financing vehicle. Yet, as the Chinese government intends to further privatize a lot of its remaining SOEs, it may still care about reputation effects, albeit for a different reason. In particular, the government may wish to establish a reputation of not expropriating the wealth of external shareholders in order to facilitate future SIPs.

When the government tries to exploit windows of opportunity at SIP-time, it likely will sell more shares during booming stock markets. In that case, the market return preceding the SIP will be positively related to the fraction of new shares sold. Also, if the government hopes to take advantage of an information spillover effect by selling more shares in times of SIP clustering, the fraction of new shares sold to the general public will be positively related to the

number of historical SIPs.

3.2. Underpricing

3.2.1. Ex-ante Uncertainty

Almost all theories attempting to explain the phenomenon of IPO underpricing, namely the positive first-day return on a new offering, start from the existence of information asymmetries. Different forms of information asymmetries have led to different explanations for underpricing. Information asymmetries between informed and uninformed investors, for example, are the basis of Rock's (1986) winner's curse model. Underpricing hereby serves as a compensation for the uninformed investors who fear that they are allocated shares only when the offering is being over-priced. Information asymmetries between investors and IPO candidates may also cause a lemon's problem. As a result, firms of high quality have to sell their shares at a large discount to signal their quality (e.g., Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989) or to induce investors to produce information (e.g., Chemmanur, 1993).

Whatever the source of information asymmetries, the theories on IPO underpricing have agreed that ex-ante uncertainty regarding firm value is positively related to the magnitude of underpricing. Consequently, smaller and younger firms are expected to incur larger underpricing costs as they have lower visibility. Also, profits from future investment projects may be difficult to predict. Then, firms with significant growth opportunities may have to underprice their shares to a larger extent at IPO-time. These relations have been documented in numerous studies on IPO underpricing (e.g., Ibbotson *et al.*, 1993). We expect the above arguments to also apply in the context of SIPs. So, we hypothesize a negative relation between firm size and underpricing and a positive relation between the SOE's market-to-book ratio and

underpricing. As many SOEs only report the date of incorporation rather than their founding date in their SIP prospectus, we are not able to determine the firm's age in a correct way.

3.2.2. Efforts to Reduce Information Asymmetries

Firms that face large ex-ante uncertainty regarding their value may do efforts to mitigate information asymmetries, to reduce the required underpricing. First, a high debt ratio pre-IPO is sometimes considered as a commitment signal to outside investors as debt financing imposes a hard budget constraint on the firm's management (Heinkel and Zechner, 1990; Nachman and Noe, 1994). Then, leverage will negatively affect underpricing. In the case of Chinese SIPs, however, a high debt ratio may reflect soft budget constraints associated with state loans. Also, bank loans are often used to bail out failing firms rather than to play a monitoring role. Then, a high debt ratio and a debt mix that largely consists of bank loans may add to the uncertainty regarding firm value, thereby positively impacting on SIP underpricing. Consistent with these ideas, Su (2004a) finds that leverage pre-SIP and underpricing are positively related.

Second, the special role of institutional investors in reducing information asymmetries recently has received much attention in the IPO literature. In particular, the use of bookbuilding to sell the IPO shares and the pre-allocation of shares to institutional investors can help to diminish underpricing (e.g., Cornelli and Goldreich, 2001; Jenkinson and Ljungqvist, 2001; Huyghebaert and Van Hulle, 2006). The general idea underlying bookbuilding is that involving professionals who are better able to evaluate the true worth of the firm should help to mitigate information asymmetries at IPO-time and therefore reduce underpricing. Share pre-allocation also helps to restrain underpricing as incentive problems with small retail investors are curbed. These notions have received some empirical support. For instance, Ljungqvist and Wilhelm

(2002) show that the process of bookbuilding has reduced the indirect issuance costs, which mainly consist of underpricing. Also, Huyghebaert and Van Hulle (2006) find supporting evidence that share pre-allocation to institutional investors reduces underpricing and increases post-IPO stock liquidity.

Jones *et al.* (1999), however, find that privatizing governments typically use fixed-price offers rather than bookbuilding to market SOE shares. As the bookbuilding method has only been introduced as of 2004 in China, we are unable to examine its relation with underpricing. Yet, this study investigates the impact of share pre-allocation to institutional investors – which became possible as of May 1998 – and expects a negative relation with underpricing.

3.2.3. Ownership Divested by the Original Owner

Another important determinant of underpricing likely is the ownership divested by the original owner(s). Based on the signaling models of Grinblatt and Hwang (1989) and Welch (1989), owners in high-quality firms signal their firm's quality by divesting only a small portion of shares with large underpricing at IPO-time as they anticipate to recoup the latter costs through future seasoned offerings, after firm quality is revealed. Consequently, these models predict a negative relation between ownership divested by original owners and underpricing. On the other hand, as argued by Beatty (1989), smaller levels of ownership divestment reduce the uncertainty surrounding the offering and should reduce underpricing. In that case, the relation between ownership divested and underpricing likely is positive.

In the case of an SIP, it can be argued that the ex-ante uncertainty involves not only firm value, but also the government's commitment to its privatization policy. As a result, the impact of ownership divested by the original owner, namely the state, becomes even more complex. On

the one hand, the government may continue to interfere with the daily operations of a newly privatized firm when it retains a high ownership stake. Then, it may pursue political objectives in addition to and in conflict with profit maximization, such as vetoing the layoff of redundant workers. Consistent with these ideas, Vining and Boardman (1992) and Majumdar (1998) find evidence that privately owned firms outperform partially privatized firms. Investors therefore may require more underpricing as a compensation for the expected inefficiencies caused by continued government interference. Then, the percentage of shares allocated to the general public will be negatively related to first-day returns.

On the other hand, Perotti (1995) shows that a privatizing government may intentionally use both the fraction of shares sold and underpricing as mechanisms to facilitate the privatization. In his model, a small percentage ownership divested by the state at SIP-time can be viewed as a commitment signal that the government will not expropriate the wealth of external shareholders post-SIP, which supports the price at which shares can be sold in later offerings and, at the moment of SIP, reduces underpricing. By contrast, when this market-oriented government wishes to sell a relatively large portion of an SOE, it should significantly underprice the SOE in the initial offering to signal to investors that it will not interfere with the privatized firm post-SIP. The populist government, which cannot resist the political pressure to intervene with the privatized firm, will not underprice the SIP to the same extent as this government prefers to raise more issue proceeds in the near future, rather than falsely signal a commitment that it cannot keep. In other words, the populist government is too impatient to use small partial sales because its policy preferences will eventually become known and so, the offsetting economic benefits from privatization will never materialize in its privatizations.

As argued before, the literature on Chinese SIPs so far has found conflicting results on

this relation. Also, while Mok and Hui (1998) and Chan *et al.* (2004) find the same positive sign, they interpret their results differently. Mok and Hui suggest that (domestic) investors regard ownership retained by the government as a signal of its confidence in future firm performance and therefore require less underpricing. By contrast, Chan *et al.* argue that investors fear the inefficiencies caused by government interference, which results in lower first-day returns. Yet, Perotti's model indicates the need to control for the endogenous nature of ownership divestment when examining its impact on underpricing.

3.2.4. Prevailing Market Conditions

Studies on IPO underpricing also identify over-optimism and investor fads as a determinant of first-day returns (e.g., Ritter, 1991; Shiller, 1990). Prevailing market conditions may influence the investor assessment of firm risk and opportunities. Specifically, when market returns are high or when there is a clustering of IPOs, investors may be less risk averse and/or more optimistic regarding future firm performance. As a result, this may increase first-day returns. The empirical evidence on IPOs so far has demonstrated that prevailing market conditions pre-IPO influence underpricing. For instance, Ritter (1984) documents a positive relation between the number of prior IPOs and average underpricing during the hot issue market of the 1980. Also, Derrien and Womack (2003) find that the market return before IPO significantly increases underpricing in 264 French IPOs between 1992 and 1998.

As pointed out by Mok and Hui (1998) and Su (2004a,b), these arguments are particularly important in a relatively young equity market like China. The reason is that investors in an emerging market generally lack investment experience and sometimes are more speculative. We use the historical stock market return as well as the historical SIP volume to

capture stock market conditions. Under this hypothesis, we expect that both variables have a positive impact on underpricing. Up till now, only Su (2004a, b) has examined the relation between stock market variables, in particular historical stock market returns, and underpricing in Chinese SIPs and he finds mixed evidence.

Insert Table 1

4. Sample Selection and Description

Our sample includes data on 599 non-financial firms¹⁵ issuing A shares for the first time on the Shanghai stock exchange over the period 1994-2002. This database – which contains consolidated financial statement information – was obtained from Shenyin & Wanguo Securities Company Limited, one of the most respectable investment bankers in China. We use 1994 as a starting year since new rules closer to international accounting standards were introduced as of January 1994. As a result, including data before 1994 might cause incomparability problems (see also Sun and Tong, 2003). As the data collection process was time-consuming, we only included SOEs that became listed on the Shanghai stock exchange in our sample. While the listing requirements on SHSE are more rigorous than on SZSE, Sun and Tong (2003) find that SOEs do not behave differently upon SIP across these two exchanges. To be included in our sample, firms were required to have at least one year of pre-privatization consolidated financial statements in the database.

To examine the government’s divestment decision, we select firms in which the Chinese government – direct or indirect – owns a stake just before the firm’s SIP. Specifically, we

¹⁵ Financial firms are excluded as these firms differ substantially from others and as their financial statements are compiled in another manner.

choose firms that have state shares or state-owned legal person shares outstanding before going public (see also footnote 9). Detailed ownership data was collected from the SINA Finance database, which provides information on the type of legal persons (state-owned versus non-state-owned). Finally, as noted by many studies using Chinese stock market data (e.g., Chan *et al.*, 2004), there is usually a time lag between the stock offering – i.e. the moment when the offer price is set – and the actual listing of shares. In some extreme cases, there is a lag of several years for stocks with ‘pending historical problems’. Given that the decision process for listing those SOEs could be different from that of others, we deleted firms where the time lag between offering and listing exceeds six months. Our final sample includes data on 451 SOEs.¹⁶ For all 451 firms in the sample, we obtained the issue prospectus and the consolidated financial statements up till three years before the SIP, if available. The stock market return data were collected from Datastream.

Table 2, Panel A presents information on the industry distribution of the firms in our sample, using the CSRC industry classification. We provide information for the full sample of 451 SOEs as well as the limited sample of 368 companies where the government still owns a majority stake right before the SOE’s public offering. The table shows that a majority of the sample firms (61.20%) is active in manufacturing. This is not surprising as Chinese SOEs mainly developed out of the necessity of heavy industries and products of strategic importance, such as energy resources, primary metals and basic life necessities (Lin *et al.*, 1998). Panel B shows that the annual number of SIPs is fairly large – except for 1995 – but not evenly spread over the period 1994-2002.

¹⁶ We did robustness checks using other cutoff lags, such as one year (463 firms) and three months (430 firms). Our conclusions continue to hold under these alternative cutoff definitions. The results from these robustness checks are not reported, but can be obtained from the authors upon request.

Insert Table 2

Table 3 provides some descriptive statistics on the SIP transaction terms and firms involved. The average (median) fraction of shares sold to the general public at SIP-time is 27.75% (27.99%) and the average (median) funds collected amount to 238,050,000 (151,560,000) RMB Yuan after adjusting for the annual inflation rate.¹⁷ Compared to the figures reported by Jones *et al.* (1999), the Chinese government divests a far smaller stake at SIP-time. After adjusting for the market return on the first trading day, the average (median) underpricing amounts to 137.30% (122.86%), which is comparable to that reported in other studies on Chinese SIPs (e.g., Su, 2004a,b), but considerably higher than for SIPs in other countries. Dewenter and Malatesta (1997) and Laurin *et al.* (2004), however, point out that initial returns are significantly larger in relatively primitive capital markets, which could explain the findings for China. In the case of China, large underpricing may also have been necessary to deal with the cultural aversion to stock ownership and to elicit the appetite of the relatively poor median-class to participate in one of the largest privatization programs worldwide. The average (median) number of days elapsed between share offering and listing is 34 (23) in our sample. Even when restricting this window to six months, we observe that LISTINGLAG is considerably skewed to the right.

Firm characteristics are measured in the year before SIP. Firm size differs largely across firms, independent of whether it is proxied by total assets or sales. The average firm has a return on assets (EBIT/total assets) of 13.09%. In addition, the average EBITDA/total assets and valued added/total assets amounts to 16.49% and 21.91%, respectively. As only firms with three consecutive years of profits are eligible for listing according to Chinese corporate law, it comes

as no surprise that ROA in the year preceding SIP is always positive. Leverage (book value of total debt/book value of total assets) averages to 53.45% in the year before SIP. As far as the composition of the debt (debt mix) is concerned, we find that bank loans on average represent 48.47% of total debt outstanding. Given that the corporate bond market is almost non-existent in China, the other debt largely consists of loans extended by other SOEs (known as the *triangular debt problem*). The average percentage of subsidies relative to sales is 0.35%. The median firm did not receive subsidies, however. For firms with subsidies, this percentage averages to 1.33%.

Various measures are computed to capture the SOE's growth opportunities at SIP-time. The market-to-book ratio is calculated as the sum of market value of equity (using the offer price) and book value of debt divided by the book value of total assets and averages to 2.16. The average investment rate, calculated as capital expenditures relative to total assets, is 9.72% in the year before SIP. In addition, the average assets growth rate pre-SIP is 23.83% whereas the average sales growth rate amounts to 16.55%. As far as operating efficiency is concerned, administrative expenses and the sum of administrative and operating expenses on average represent 6.67% and 10.96% of sales, respectively.

Finally, the average firm has a state ownership of 75.48% before and 54.32% after SIP, but the high standard deviation indicates that there is a large variation across firms.¹⁸ The average percentage of non-tradable legal person shares is 14.60% before and 10.23% after SIP.

Insert Table 3

¹⁷ By November, 2005, 1 RMB Yuan \cong 0.12 dollar.

¹⁸ Note that the difference between average state ownership before (75.48%) and after (54.32%) SIP is not equal to the average percentage of shares sold to the general public (27.75%), due to the difference in denominator when calculating average state ownership before and after SIP (i.e. the total number of shares outstanding before and after SIP, respectively).

5. Empirical Results

In this section, we first identify the determinants of the fraction of shares sold to the general public in Chinese SIPs over the period 1994-2002. Then, we investigate the likelihood that the Chinese government relinquishes its majority stake at SIP-time. Section 5.3. examines the determinants of SIP underpricing. Finally, in Section 5.4., we check the interdependencies between the share allocation and underpricing decisions.

5.1. Determinants of Public Share Allocation

5.1.1. Model and Regression Results

Based on the discussion in Section 3.1., we estimate the following OLS model for the fraction of shares sold to the general public at SIP-time:

PUBLIC ALLOCATION

$$\begin{aligned} &= f(\alpha_1\text{ROA} + \alpha_2\text{LEVERAGE} + \alpha_3\text{DEBT MIX} + \alpha_4\text{SUBSIDIES} + \alpha_5\text{MARKET-TO-BOOK} \\ &+ \alpha_6\text{FIRM SIZE} + \alpha_7\text{ADMIN/SALES} + \alpha_8\text{MARKET RETURN} + \alpha_9\text{VOLUME} \\ &+ \alpha_{10}\text{FOREIGN} + \alpha_{11}\text{REGULATED} + \alpha_{12}\text{INDUSTRY DUMMIES}) \end{aligned}$$

The dependent variable PUBLIC ALLOCATION is measured as the percentage of shares (A shares) sold to the general public relative to the total number of shares outstanding at SIP-time.

The explanatory variables included in the equation are measured during the year before SIP and are calculated as follows: ROA is EBIT to total assets. LEVERAGE is the book value of total debt divided by total assets. DEBT MIX is calculated as bank loans relative to total debt. SUBSIDIES is the ratio of subsidies received from the government to total sales.

MARKET-TO-BOOK, which is calculated as the sum of market value of equity and book value of debt scaled by the book value of total assets, captures the firm's growth opportunities. FIRM SIZE is measured by the logarithm of total assets pre-SIP and has been deflated to control for the annual inflation rate. ADMIN/SALES is the ratio of administrative expenses to total sales. MARKET RETURN is the return on the Shanghai stock exchange in the year before the SIP whereas VOLUME is the number of SIPs in the year preceding SIP scaled by the total number of SIPs in the raw data sample (599 firms).

In addition, we control for the fact that some SOEs also issue B or H shares to foreign (institutional) investors, which usually occurs some time before their A share offering. As the B/H share market is segmented from the A share market and as the B/H share market is not liquid (e.g., Mok and Hui, 1998), we consider the real SIP to start at the firm's public A share offering.¹⁹ Yet, for these firms, the fraction of shares sold to the general public at SIP-time likely is lower, *ceteris paribus*. FOREIGN has the value of one if there is a B/H share offering preceding the SIP and zero otherwise. In our sample, 32 firms issue B or H shares before their A share offering. For these firms, the average (median) percentage of shares offered to foreign investors equals 30.40% (27.99%). Finally, we control for the fact that the government likely opens ownership to a smaller extent in highly regulated SOEs. China regulates utilities, energy, telecommunications, and the financial industries (see also Sun and Tong, 2003). For the 19 SOEs in these industries, REGULATED equals one. Besides, we also include 14 industry dummy variables to control for industry-specific determinants of the public share allocation

¹⁹ Most studies on Chinese SIPs make the same assumption, although they do not always explicitly spell out this (e.g., Sun and Tong, 2003; Wei *et al.*, 2005). Also, studies on IPO underpricing in China investigate first-day returns in the A share market, irrespective of whether the firm also introduced shares on the B/H share market. However, we have checked the robustness of our results when we leave out the 32 firms that issue B or H shares from the sample. We find that our conclusions continue to hold in this restricted sample even though the model's explanatory power is

process. These industry dummies are based on the Chinese CSRC industry classification and are included for each industry that contains at least ten SIPs in our sample.

To limit the influence of outliers, all variables – except dummy variables – are winsorized at 5-95%, i.e. the corresponding percentiles replace extreme values. Table 4 presents the correlation matrix among dependent and explanatory variables. Multicollinearity is unlikely to be a problem since pairwise correlations among the explanatory variables never exceed 0.7 and as the variance inflation factors are all below 5 (Judge *et al.*, 1988). Yet, as we notice that the correlation coefficient between ROA and MARKET-TO-BOOK amounts to 0.66, we include these variables together as well as separately in the model. Table 5, Panel A presents the results of these three OLS regression models. Panel B and C then report the results when the full sample is split up into two sub-periods, to test whether the determinants of public share allocation have changed over time.

Overall, the results in Table 5, Panel A confirm that poor SOE performance and financing constraints are the main driving forces behind the government's decision to sell shares to the general public at SIP-time. First, ROA, the proxy for internal cash generation, is significantly negatively related to PUBLIC ALLOCATION. The government thus sells more (primary) shares in firms with limited profitability. This finding is robust when removing the market-to-book ratio from the model in column two. When internal cash generation is measured by EBITDA²⁰ or value added relative to total assets, this relation continues to hold. Second, leverage is significantly positively related to PUBLIC ALLOCATION, which indicates that the wish to reduce the debt ratio is an important determinant of the fraction of new shares issued at

reduced. The results of this robustness check are not reported, but can be obtained from the authors upon request.

²⁰ We do not use EBITDA in the base model, as for 62 firms the data on non-cash expenses in the year(s) before SIP are not available. Yet, when we run the regression model on the reduced sample of 389 firms as well as a sample

SIP-time. These results contrast with the findings of Sun and Tong (2003), who find no relation with profitability, but show that the Chinese government retains more shares in highly leveraged firms.²¹ The composition of the debt has no impact, however. The reason could be that we are not able to distinguish between performing bank loans and non-performing bank loans in state-owned banks. Interestingly, we find that SUBSIDIES significantly increases the fraction of new shares allocated to the general public. Although the percentage of subsidies relative to sales may not be a perfect proxy for soft budget constraints, it does provide some evidence that the government is motivated to ease the problem by means of the public equity market.

Investment opportunities have no impact on the fraction of primary shares sold at SIP-time. This finding is robust after excluding ROA from the model in column three. Furthermore, when we delete the stock market variables (MARKET RETURN and VOLUME) from the model, the variables capturing investment opportunities remain insignificantly related to public share allocation. So, these market variables are not spuriously capturing the firm's growth prospects. Overall, these findings add further substance to the conclusion of Yu and Cheng (2001) that seasoned equity offerings in China are not driven by investment opportunities either.

Consistent with Sun and Tong (2003), we find that the government opens ownership to a smaller extent in large firms, *ceteris paribus*. This result likely reflects that the Chinese government is more cautious in dealing with the privatization of the larger SOEs since these firms have more employees and usually incur more organizational and social problems upon widening their ownership structure. We find no significant relation between public share

where missing values for EBITDA are replaced by the sample median, we find that our conclusions are robust.

²¹ We have checked that the difference in sampling period is not driving these divergent results by estimating our model on the SIPs over 1994-1998, which is the period examined by Sun and Tong (2003). Even in this subperiod,

allocation and operating efficiency, proxied by the ratio of administrative expenses to total sales. The latter conclusion also holds when using the ratio of administrative plus operating expenses to total sales to measure the SOE's efficiency. Yet, we do recognize that these variables are not generally accepted proxies for operating efficiency.

The coefficient on MARKET RETURN is not significant, which is consistent with the idea that the government may wish to establish a reputation of not expropriating the wealth of external shareholders in order to facilitate future SIPs. In contrast to private-firm IPOs, where the listing usually is a one-time-event only for owners, a government that initiates a privatization program has to take into account that selling more – highly priced – shares during periods of market (over-)optimism may fold the success of future SIPs. The reason is that after investors have learned about the government's opportunistic behavior, it may be hard to convince them to participate in later SIPs. If anything, the negative coefficient on MARKET RETURN, which is marginally significant, suggests that fewer shares are sold when stock prices are booming. We find that this result is robust when measuring historical stock market returns over other windows (six, three and one month(s)) before the SIP. By contrast, VOLUME is significantly positively related to PUBLIC ALLOCATION. So, the government tends to issue more shares following a hot SIP-year, i.e. when there is a clustering of SIPs in the previous year. Whereas this positive coefficient is consistent with the IPO literature, where it is argued to be the result of an information spillover effect, a more simple explanation may hold in the case of SIPs. Specifically, the Chinese government may allow fewer SOEs to go public following a year with a lot of listings. As a result, one single firm may be allowed to raise a larger amount of equity and new shares.

we find that leverage is significantly positively related to PUBLIC ALLOCATION.

Finally, the variable FOREIGN is significantly negatively related to public share allocation, confirming that fewer shares are sold to the general public if shares are also offered to foreign investors (usually within the same year). Also, the coefficient on REGULATED is significantly negative, which supports the idea that the government is careful in privatizing SOEs that are particularly vulnerable to post-SIP government changes in regulation or authorized rates (Perotti, 1995). Indeed, by retaining a large stake in these firms, the government can signal to investors that policy reversals are unlikely. As far as the industry dummy variables are concerned, we find that the government opens ownership to a smaller extent in SOEs in IT, pharmaceutical, retail and conglomerates industries (not reported). Yet, when year dummies are included, the latter two industry dummies are no longer statistically significant.²²

In Panel B and C, we split up the whole sampling period into two sub-periods using 1999 as a dividing year. By examining SIPs before and as of 1999 respectively, we are able to investigate whether the determinants of public share allocation have changed over time. Dewenter and Malatesta (1997) argue that during the early stages of a privatization program, there may be greater uncertainty regarding the program and government officials may try to solidify political support. The reason why we use 1999 as cutoff year is that up till 1999, the Chinese central government set annual national quotas for IPOs (see also Sun and Tong, 2003). Thereby, the government may have restrained the number of shares to be sold to the general public for a single firm, in order to allow more firms to go public. The average (median) PUBLIC ALLOCATION amounts to 24.28% (24.15%) before and 30.89% (31.58%) after 1999. In the split-sample regression models, we are not able to include both ROA and MARKET-TO-BOOK into one model as the correlation coefficient between these two variables

²² Also, in this model the market-to-book ratio becomes significantly negative. We elaborate on this result further on

now amounts to 0.7056 and 0.7086, respectively. Not surprisingly, the high correlation coefficient and the more limited sample size in the subsamples led to estimation problems.

We find that the significance of the variables LEVERAGE, SUBSIDIES and REGULATED in the full sample is driven by the SIPs during 1994-1998 (Panel B). For the second subperiod (1999-2002), the parameter estimates of these variables are not significantly different from zero. Yet, we do find that the coefficients of ROA and MARKET-TO-BOOK are significantly negative in the latter subperiod (Panel C) whereas these variables have no impact in the earlier window. Finally, the size and significance levels of the other variables across the two subperiods are largely comparable to those in Panel A.

Overall, these results seem to suggest that during the early privatization years, the Chinese government mainly introduced firms that benefited from a too relaxed (government) financing. For these firms, which were highly levered and consumed substantial subsidies, the government likely welcomed the stock market as an alternative financing source. Indeed, in these firms, a larger fraction of new shares was raised. These findings are consistent with Tian (2001) and Sun and Tong (2003), who find that there is no obvious relation between pre-SIP profitability and the change in state ownership for Chinese SIPs before 1999. Interestingly, Su and Fleisher (1999) find that over 90% of Chinese newly privatized firms listed before June 1994 execute seasoned equity offerings within a short period after their SIP whereas Yu and Cheng (2001) conclude that such offerings are not driven by investment opportunities. In the later years of its privatization program, we find that the government opens ownership to a larger extent in firms with inferior profitability and limited growth prospects. These results suggest that after having acquired some privatization experience, the Chinese government has started to value the

market disciplining function of a stock market quotation in an attempt to improve SOE performance. A potential explanation could be that the development of domestic capital markets (i.e. pricing efficiency, liquidity, transparency, etc.) is needed before the market disciplining function of listing can come to effect. Gupta (2005), for instance, shows that even partial privatizations may contribute to performance improvements, because of a market information effect. Consistent with this idea, Fama (1980) suggests that stock prices can serve as a signal of managerial ability whereas Holmstrom and Tirole (1993) and Tirole (2001) argue that share prices can be used to design more effective incentive schemes for the firm's management. Yet, markets that are not sufficiently developed likely will find it difficult to play such a role.

Insert Tables 4 and 5

5.1.2. Robustness Checks

As argued by Papke and Wooldridge (1996) and Arugaslan *et al.* (2004), a tobit analysis might be more appropriate for fractional data that are censored at zero to the left and at one to the right. For the purpose of finding out whether a different methodology might change our conclusions, we also ran a tobit analysis on our sample. Our conclusions remain robust. In addition, we calculated the explanatory variables using two-year averages of firm-level variables whenever financial statements were available. This robustness check should help to reduce the potential manipulation of annual accounts in the year before going public.²³ We find that in this limited sample, our conclusions continue to hold. Finally, we also used 1998 and 2000 as cutoff year for the split-sample regressions and find that the results are qualitatively the same. The outcomes of

²³ Teoh *et al.* (1998), for example, find that for private-firm IPOs, financial statements are dressed up in the year before going public.

these additional robustness checks are not reported in the paper, but are available from the authors upon request.

5.2. Determinants of Relinquishing a Majority Stake at SIP-time

In this section, we set up a multivariate logit model to examine the likelihood of government ownership (direct and indirect via state-owned legal person shares) decreasing below 50% at SIP-time. In our sample, the Chinese government owns a majority stake in 368 SOEs right before their SIP; in 62 firms (16.85%), the governments relinquishes this majority stake at the moment of SIP. The variables included are the same as those used in the OLS model on the size of public share allocation. However, because of the reduced sample size, including all 14 above-discussed industry dummy variables posed a convergence problem. So, the logit regression model only includes a dummy variable for the five largest industries in the reduced sample. The results are presented in Table 6.

Overall, we find that ROA and LEVERAGE, which were highly significant in the OLS model, do not affect the likelihood of selling a majority stake at SIP-time. This result may not be surprising given the summary statistics that we reported for these variables in Table 3. In other words, none of the SOEs in our sample are excessively levered or loss-making and, thus, based upon the previous OLS model, the government would not sell a very large stake. Interestingly, the results show that the market-to-book ratio becomes significantly negative in the logit model. This finding indicates that the government is less likely to relinquish its majority stake in firms with favorable growth prospects, *ceteris paribus*.

Finally, the variables SUBSIDIES, FIRM SIZE and FOREIGN continue to play a role. The government is more likely to give up its majority stake in smaller firms and SOEs that

receive substantial subsidies. Also, in SOEs that sell shares to foreign investors, the government is more likely to end up with an ownership stake below 50%.

Insert Table 6

5.3. Determinants of Underpricing

5.3.1. Model and Regression Results

In this section, we investigate the determinants of underpricing in Chinese SIPs using an OLS regression model. UNDERPRICING is hereby defined as the first-day stock return (over offer price) minus the corresponding Shanghai stock market return. The OLS model – which was developed in Section 3.2. – looks as follows:

UNDERPRICING

$$= f(\beta_1\text{LEVERAGE} + \beta_2\text{DEBT MIX} + \beta_3\text{MARKET-TO-BOOK} + \beta_4\text{FIRM SIZE} + \beta_5\text{MARKET RETURN} + \beta_6\text{VOLUME} + \beta_7\text{LISTINGLAG} + \beta_8\text{PREALLOCATION} + \beta_9\text{FOREIGN} + \beta_{10}\text{REGULATED} + \beta_{11}\text{INDUSTRY DUMMIES})$$

Most variables have been defined before, except for LISTINGLAG and PREALLOCATION. LISTINGLAG is the logarithm of the number of days elapsed between the start of the share offering and the actual share listing (see also Chowdhry and Sherman, 1996). Also, during the period from May 1998 to August 2000 the Chinese government allowed 48 firms issuing more than 50,000,000 shares to pre-allocate shares to investment funds. Besides, since 2000, 13 firms in our sample pre-allocated shares to other ‘strategic’ institutional investors. The dummy variable PREALLOCATION equals one if pre-allocation happened and zero otherwise.

Table 7 provides an overview of the correlations among all variables. As the maximum

correlation coefficient is only 0.4281, estimation problems due to multicollinearity are unlikely. This is confirmed by the variance inflation factors. Table 8, Panel A presents the results of the OLS regression model. In this model, LEVERAGE as well as DEBT MIX have no impact on SIP underpricing. This result is not surprising as debt financing imposes no hard disciplining on the firm's management in the context of Chinese SIPs. Interestingly, firms with better growth prospects as captured by a higher market-to-book ratio incur significantly less underpricing, despite the uncertainties associated with future investment projects. Yet, consistent with the IPO literature, FIRM SIZE – which in the IPO literature generally proxies for the importance of information asymmetries regarding firm value – is significantly negative. In addition, we find that the stock market return and the number of SIPs in the previous year have a significantly positive impact, which, to some extent, may reflect the existence of investor (over-)optimism. This is consistent with Su (2004b) who finds that the market return pre-SIP is positively related to underpricing. Indeed, the positive sign for VOLUME is inconsistent with the idea that this variable captures information spillovers in the underpricing equation as such spillovers should lead to a more accurate pricing of the SOE. However, we should treat the latter conclusion with caution, as VOLUME is no longer significantly different from zero in the 3SLS model (see Section 5.4. hereafter). To be noted, when we calculate the return on the Shanghai stock exchange during the six, three or one month(s) before SIP, we find that MARKET RETURN remains significantly positive.

Consistent with the conclusions of previous papers on underpricing in the Chinese stock market (e.g., Chan *et al.*, 2004), the time lag between share offering and listing significantly increases underpricing. The results further show that domestic investors need not be compensated with higher underpricing when shares are allocated to foreign investors, but this

conclusion again changes in the 3SLS model. Unlike Dewenter and Malatesta (1997), who conclude that first-day returns are significantly larger in highly regulated industries, we find no relation between REGULATED and underpricing in Table 8, Panel A. Yet, we documented in the previous section that the Chinese government is cautious in privatizing these firms, which could explain our finding in the underpricing model.

Next, we split up the whole sampling period into two subperiods (before and after 1999) and report the results in Panel B and C, respectively. The average (median) UNDERPRICING amounts to 136.98% (118.51%) before and 137.59% (127.82%) after 1999. Overall, the determinants of underpricing are similar across these two windows, except that LISTINGLAG is only significant in the early privatization years. As the average LISTINGLAG in the first subperiod amounts to 40 days compared to only 25 days in the second subperiod, we conclude that the Chinese government has been able to reduce the uncertainty surrounding SIPs over time, from which it has benefited under the form of a better pricing of the SIP.

Finally, to compare our conclusions with those of previous studies that consider the government divestment process to be exogenous, we re-estimate the above OLS model where we also include PUBLIC ALLOCATION. We find that the coefficient on this variable is not significantly different from zero whereas the results on the other variables do not change. In the next section, we take the potential simultaneity of both variables into account.

Insert Tables 7 and 8

5.4. Simultaneous Equations Model

Previous studies on underpricing in the Chinese stock market (e.g., Mok and Hui, 1998; Chan *et*

al., 2004; Chen *et al.*, 2004) fail to consider that underpricing and public share allocation likely are jointly determined by the government when a SOE is selected for listing. As we already demonstrated in the previous sections; various firm and stock market characteristics impact the public share allocation decision. Simply including the observed public allocation at SIP-time likely causes an endogeneity problem and, therefore, may give rise to spurious conclusions for the relation between this variable and underpricing. Similarly, the expected underpricing may influence the government's selling decision at SIP-time. Beatty and Ritter (1986) and Mauer and Senbet (1992), for example, present evidence that initial returns are negatively related to the offering size in IPOs. For SIPs, Jones *et al.* (1999) find that first-day returns are positively related to the percentage of an SOE sold in the offering. Furthermore, the theoretical model of Perotti (1995) argues that the government may simultaneously use public share allocation and underpricing to show the seriousness of its intents. Therefore, in this section we build a simultaneous equations model for PUBLIC ALLOCATION and UNDERPRICING, which looks as follows:

$$\left\{ \begin{array}{l}
 \text{PUBLIC ALLOCATION} \\
 = f(\alpha_1 \text{UNDERPRICING} + \alpha_2 \text{ROA} + \alpha_3 \text{LEVERAGE} + \alpha_4 \text{DEBT MIX} + \alpha_5 \text{SUBSIDIES} + \\
 \alpha_6 \text{MARKET-TO-BOOK} + \alpha_7 \text{FIRM SIZE} + \alpha_8 \text{ADMIN/SALES} + \alpha_9 \text{MARKET RETURN} + \\
 \alpha_{10} \text{VOLUME} + \alpha_{11} \text{FOREIGN} + \alpha_{12} \text{REGULATED} + \alpha_{13} \text{INDUSTRY DUMMIES}) \\
 \\
 \text{UNDERPRICING} \\
 = f(\beta_1 \text{PUBLIC ALLOCATION} + \beta_2 \text{LEVERAGE} + \beta_3 \text{DEBT MIX} + \beta_4 \text{MARKET-TO-BOOK} + \\
 \beta_5 \text{FIRM SIZE} + \beta_6 \text{MARKET RETURN} + \beta_7 \text{VOLUME} + \beta_8 \text{LISTINGLAG} + \\
 \beta_9 \text{PREALLOCATION} + \beta_{10} \text{FOREIGN} + \beta_{11} \text{REGULATED} + \beta_{12} \text{INDUSTRY DUMMIES})
 \end{array} \right.$$

Table 9 reports the results of the simultaneous equations model. The system is estimated by three-stage least squares (3SLS), which takes the information contained in the contemporaneous correlations among the error terms into account. Both of the equations are

over-identified since several of the exogenous variables are unique to each equation. Judge et al. (1988) argue that the asymptotic distribution of 3SLS estimators is normal. The data show that underpricing has no significant impact on public share allocation in column one of Table 9. Also, the parameter estimates and significance levels of the other variables are not affected when compared to Table 5, Panel A. Yet, we do find that the fraction of shares sold to the general public significantly positively affects underpricing in column two of Table 9. Overall, this result is consistent with the prediction of Perotti (1995) that the relation between underpricing and capital divested is positive when the government wants to show its commitment to privatization. In that case, a market-oriented government will either sell a small portion with limited underpricing or a large portion with more underpricing to differentiate itself from a more populist government. Our results demonstrate that the fraction of shares sold is determined first and that required underpricing follows from it.

Next, we find that some other variables – FIRM SIZE and VOLUME – that were highly significant in the OLS model are no longer significant in the underpricing equation of Table 9.²⁴ This indicates that their impact in Table 8 was driven by the fact that these variables basically influence the public share allocation decision, as was already documented earlier in Table 5. More generally, the lack of significance of firm size and leverage and the negative relation of MARKET-TO-BOOK indicate that the ex-ante uncertainty surrounding an SIP is different from that in a private-firm IPO. These results add further support to the conclusion of Jones *et al.* (1999) that the commonly accepted asymmetric-information-based explanations for underpricing play little or no role in explaining initial returns in SIPs. Yet, a long time lag between share offering and listing is found to be a source of uncertainty in the case of Chinese

²⁴ When we delete PREALLOCATION from the model, we find that firm size is not significantly related to

SIPs.

Finally, we find evidence that share pre-allocation to institutional investors decreases underpricing whereas the pre-issuance of shares to foreign investors leads to higher first-day returns. The latter finding is consistent with Biais and Perotti's (2002) prediction that when shares are sold to foreign investors, domestic investors need to be compensated by larger underpricing for their limited stake in the offering. The reason is that the likelihood of interference is higher when the shares in the SIP are not sufficiently spread among the median-class. Yet, a positive sign for FOREIGN could also indicate that domestic investors have more confidence in the performance of the SOE post-SIP, thereby bidding a higher price for the firm's shares, *ceteris paribus*. As Sun and Tong (2003) find that SOEs with foreign ownership do not perform better post-SIP, the latter explanation can be rejected.

6. Conclusions

Using a sample of 451 Chinese SIPs over the period 1994-2002, we find substantial evidence that the government's decision process in privatization is not a black box, whereby the fraction of shares allocated to the general public and underpricing are highly politized and driven by variables other than economic merit, attractiveness to investors, or the need of capital (e.g., Wei *et al.*, 2005). Our study shows that poor performance and financing constraints largely drive the public share allocation decision process. Specifically, SOEs with low profitability and high leverage raise a larger portion of new shares at SIP-time. Also, ownership is opened to a larger extent in firms that receive substantial subsidies. By contrast, the government is cautious in privatizing large SOEs in regulated industries as these features negatively affect the allocation of

underpricing either. So, PREALLOCATION is not spuriously proxying for firm size in our model.

shares to the general public. The stock market return pre-SIP is not significantly related to the fraction of shares sold, supporting the idea that the government wishes to establish a reputation of not expropriating the wealth of external investors, to facilitate future SIPs. A clustering of SIPs in the previous year is shown to increase public share allocation. Finally, we find no evidence that the raised equity is needed to finance the SOE's growth as none of the variables capturing the firm's investment opportunities is significantly different from zero. Yet, we do find that that the government is more likely to relinquish its majority stake in firms with limited growth prospects.

The results on underpricing provide support for Perotti's prediction that the government uses underpricing to facilitate privatizations. Specifically, after the endogeneity of the public share allocation decision is accounted for, we find that this variable is significantly positively related to first-day returns. This indicates that the government needs to offer larger underpricing when it wishes to divest more. In addition, domestic investors are compensated with more underpricing when shares are allocated to foreign investors, thereby limiting the size of the public share offering. Consistent with the IPO literature, we find that underpricing is larger when investors are (over-)optimistic and when shares are pre-allocated to institutional investors. Unlike the IPO literature, we find that the market-to-book ratio is significantly negatively related to underpricing whereas firm size and leverage have no impact. Finally, a long time lag between share offering and listing is found to be a source of uncertainty in the case of Chinese SIPs as this variable is positively related to first-day returns. Overall, these results illustrate that underpricing in SIPs occurs for different reasons than underpricing in private-firm IPOs.

In sum, our paper contributes to the literature by showing that, even when controlling for some peculiarities associated with an emerging stock market like China, theories and hypotheses

developed for the IPO of private firms cannot be easily transferred to the context of share issuing privatizations. This conclusion is remarkable as it is obtained in the context of SIPs where the government raises new equity for the SOE at the time of the SIP rather than simply transfers its ownership to the private sector by selling its own, secondary shares. Although the terms *share issuing privatization (SIP)* and *privatization IPO (PIPO)* are often used interchangeably in the literature, our study thus strongly pleads for using the first. Furthermore, our paper – using micro-data on SOEs involved in SIPs – provides more substance to the conclusion of Jones *et al.* (1999) – which is based on macro-economic variables – that SIPs are largely structured so as to overcome the political obstacles that stand in the way of successful privatization and the economic benefits that might flow from it. In addition, this paper is the first to show that the motives behind and the structuring of a privatization program may evolve over time. In the case of China, we document that during the early stage, the government mainly used the SIP to deal with the SOE's too relaxed (government) financing whereas later on, the potential to discipline SOEs (or their managers) became more important. A tentative explanation, which is not elaborated on in this paper, is that as the country's national exchanges were established only in the beginning of the 1990s, capital markets in the early stage of privatization did not meet the minimum level of development and depth to play a monitoring and disciplining function.

Last but not least, our research has some major implications for future studies on Chinese SIPs. The failure to take the endogeneity of the share allocation decision process into account might lead to spurious conclusions regarding the evaluation of performance changes following SIP, for example. Also, our study sheds some light on why the outcome of SOE reform in China is unsatisfactory so far. A lot of authors assign this to the partial nature of privatizations in China, where the government continues to hold a large majority stake in newly privatized enterprises

(e.g., Xu and Wang, 1997; Chen *et al.*, 2002). They argue that when the stock market is not able to perform its disciplining function, e.g. in the absence of the threat of hostile takeover *because of a too large state ownership*, agency problems between managers and shareholders cannot be solved. Our results suggest that this may be only one part of the story, especially in countries with relatively young capital markets. The reason likely is that when capital markets are not sufficiently developed, they are not able to play a market disciplining function by conveying information on managerial ability.

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Figure 1: Shanghai Stock Exchange Composite Index (2001-01-01 to 2004-12-31)

a. Shanghai Stock Exchange A Share Index



b. Shenzhen Stock Exchange A Share Index

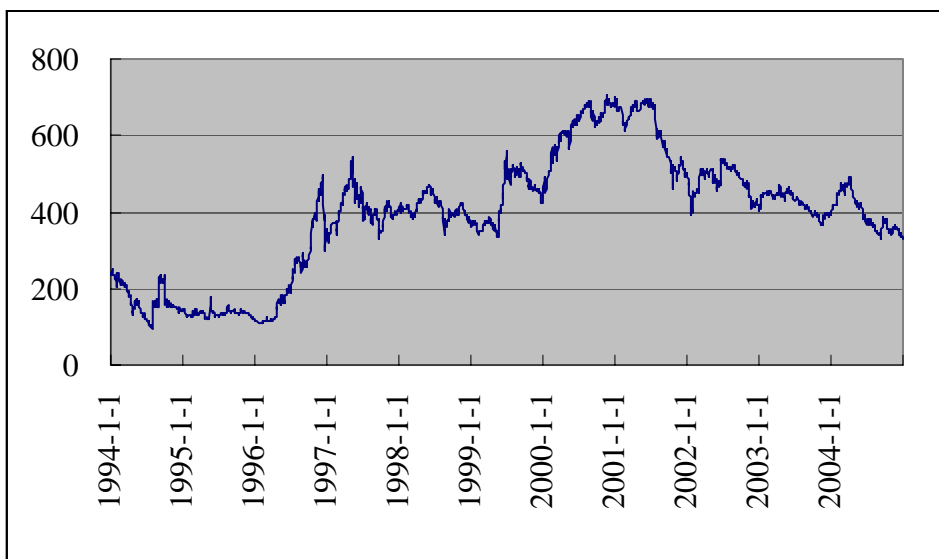


Table 1: Summary of Hypotheses

ROA is EBIT to total assets whereas LEVERAGE is the book value of total debt divided by total assets in the year before SIP. DEBT MIX is the ratio of short-term and long-term bank loans to total debt. SUBSIDIES is the ratio of subsidies scaled by sales in the year before SIP. MARKET-TO-BOOK is market value of equity (using the offer price) plus book value of debt/book value of total assets. FIRM SIZE is the logarithm of total assets in the year before SIP. ADMIN/SALES is administrative expenses to total sales. MARKET RETURN is the return on the Shanghai stock exchange in the year before SIP whereas VOLUME is the number of SIPs in the year before SIP scaled by the total number of SIPs in the sample. LISTINGLAG is the logarithm of the number of days elapsed between the start of share offering and the actual share listing. PREALLOCATION equals one if pre-allocation of shares to institutional investors happened and zero otherwise.

Panel A: Hypotheses for share allocation to the general public

| | PUBLIC ALLOCATION (the fraction of new shares sold to the general public at SIP-time) |
|--|---|
| Overcoming Financing Constraints | ROA: – LEVERAGE: + DEBT MIX: + SUBSIDIES: + MARKET-TO-BOOK: + FIRM SIZE: – |
| Promoting Financial and Operating Performance | ROA: – ADMIN/SALES: + |
| Windows of Opportunity | MARKET RETURN: + VOLUME: + |

Panel B: Hypotheses for underpricing

| | UNDERPRICING (first-day stock return over offer price minus the corresponding Shanghai stock market return) |
|--|---|
| Ex-ante Uncertainty | MARKET-TO-BOOK: + FIRM SIZE: – LISTINGLAG: + |
| (in the context of Chinese SIPs) | |
| Efforts to Reduce Information Asymmetries | LEVERAGE: –/+ DEBT MIX: + PREALLOCATION: – |
| Ownership Divested by the Original Owner | PUBLIC ALLOCATION: +/- |
| Prevailing Market Conditions | MARKET RETURN: + VOLUME: + |

Table 2: Industry and Annual Distribution of the Sample

Panel A: Industry Distribution of the Sample Firms

Column one contains the industry distribution for the full sample of 451 firms based on the Chinese Central Securities Regulatory Commission industry classification whereas column two is based on the limited sample of 368 firms where the government stake right before SIP exceeds 50%. In addition, column three and four report the industry distribution when the total sample is split up into two subsamples using 1999 as a dividing line.

| | Full sample | Limited sample | 1994-1998 | 1999-2002 |
|---|-------------|----------------|-----------|-----------|
| Agriculture, forestry and fishing | 16 | 13 | 5 | 11 |
| Mining | 7 | 6 | 2 | 5 |
| Electricity, gas and water production and supply | 18 | 16 | 9 | 9 |
| Construction | 9 | 9 | 4 | 5 |
| Transportation and storage | 29 | 26 | 8 | 21 |
| Information technology | 21 | 15 | 14 | 7 |
| Retail and wholesale trade | 39 | 28 | 30 | 9 |
| Real estate | 8 | 7 | 3 | 5 |
| Services | 14 | 11 | 8 | 6 |
| Media | 2 | 2 | 1 | 1 |
| Conglomerates | 12 | 7 | 10 | 2 |
| Manufacturing | 276 | 228 | 120 | 156 |
| <i>Food & beverages</i> | 24 | 22 | 14 | 10 |
| <i>Textile</i> | 18 | 9 | 7 | 11 |
| <i>Lumber & furniture</i> | 1 | 0 | 0 | 1 |
| <i>Printing</i> | 12 | 10 | 8 | 4 |
| <i>Petroleum, chemicals and plastic products</i> | 51 | 44 | 22 | 29 |
| <i>Electronics</i> | 12 | 8 | 5 | 7 |
| <i>Metal & non-metal</i> | 50 | 49 | 19 | 31 |
| <i>Machines</i> | 72 | 62 | 33 | 39 |
| <i>Pharmaceuticals</i> | 30 | 20 | 12 | 18 |
| <i>Other manufacturing</i> | 6 | 4 | 0 | 6 |
| Total number of firms | 451 | 368 | 214 | 237 |

Panel B: Annual Numbers of IPOs and SIPs

| | Raw sample (incl. private-firm IPOs) | Full sample (incl. only SIPs) | Limited sample |
|--------------|---|----------------------------------|----------------|
| 1994 | 66 | 42 | 33 |
| 1995 | 15 | 5 | 4 |
| 1996 | 103 | 63 | 48 |
| 1997 | 85 | 59 | 46 |
| 1998 | 53 | 45 | 44 |
| 1999 | 45 | 36 | 29 |
| 2000 | 86 | 76 | 60 |
| 2001 | 78 | 65 | 55 |
| 2002 | 68 | 60 | 49 |
| TOTAL | 599 | 451 | 368 |

Table 3: Summary Statistics for the Total Sample of N = 451 SIPs

PUBLIC ALLOCATION is the fraction of shares (A shares) sold to the general public relative to the total number of shares outstanding at SIP-time. FUNDS COLLECTED is the number of new shares offered times the offer price and has been deflated. UNDERPRICING is the first-day stock return minus the corresponding market return. LISTINGLAG is the number of days elapsed between the share offering and listing. Firm characteristics are measured in the year before SIP. TOTAL ASSETS and SALES have both been deflated. ROA is EBIT/total assets. LEVERAGE is book value of total debt/book value of total assets. DEBT MIX is the ratio of short-term and long-term bank loans to total debt. SUBSIDIES is the ratio of subsidies received from the government to sales. MARKET-TO-BOOK is the sum of market value of equity (using the offer price) and book value of debt scaled by book value of total assets. INVESTMENT RATE is capital expenditures scaled by total assets. ASSETS (SALES) GROWTH RATE is the growth rate of assets (sales) from two to one year before SIP and has been deflated. ADMIN/SALES is administrative expenses scaled by sales. ADMIN&OP/SALES is the sum of administrative and operating expenses scaled by sales. STATE OWNERSHIP is the fraction of shares owned by the government (direct and indirect via state-owned legal persons) before and right after SIP. LEGAL PERSON OWNERSHIP is the fraction of non-state-owned legal person shares before and right after SIP.

| Variable | Mean | Median | Std. Dev. | Min | Max |
|-----------------------------------|---------------|-------------|---------------|------------|-----------------|
| SIP TRANSACTION | | | | | |
| PUBLIC ALLOCATION | 0.2775 | 0.2799 | 0.0890 | 0.0277 | 0.5479 |
| FUNDS COLLECTED (RMB YUAN) | 238,050,000 | 151,560,000 | 457,215,767 | 18,287,612 | 5,793,740,001 |
| UNDERPRICING | 1.3730 | 1.2286 | 0.8894 | 0.0032 | 6.6143 |
| LISTINGLAG | 34 | 23 | 31 | 9 | 175 |
| FIRM CHARACTERISTICS | | | | | |
| TOTAL ASSETS (RMB YUAN) | 1,074,400,000 | 237,830,000 | 8,647,334,414 | 30,280,500 | 170,040,000,000 |
| SALES (RMB YUAN) | 783,400,000 | 173,410,000 | 7,643,974,374 | 6,888,650 | 161,069,000,000 |
| ROA | 0.1309 | 0.1263 | 0.0546 | 0.0437 | 0.2441 |
| EBITDA/TOTAL ASSETS | 0.1649 | 0.1532 | 0.0676 | 0.0637 | 0.3450 |
| VALUE ADDED/TOTAL ASSETS | 0.2191 | 0.1995 | 0.1034 | 0.0666 | 0.4623 |
| LEVERAGE | 0.5345 | 0.5698 | 0.1351 | 0.2278 | 0.6975 |
| DEBT MIX | 0.4847 | 0.5260 | 0.2219 | 0.0021 | 0.8072 |
| SUBSIDIES | 0.0035 | 0.0000 | 0.0085 | 0.0000 | 0.0314 |
| MARKET-TO-BOOK | 2.1622 | 2.0126 | 0.7516 | 1.1651 | 4.0506 |
| INVESTMENT RATE | 0.0972 | 0.0706 | 0.0953 | 0.0001 | 0.3801 |
| ASSETS GROWTH RATE | 0.2383 | 0.1631 | 0.3031 | -0.1119 | 1.1405 |
| SALES GROWTH RATE | 0.1655 | 0.1230 | 0.2362 | -0.1920 | 0.8387 |
| ADMIN/SALES | 0.0667 | 0.0543 | 0.0448 | 0.0000 | 0.1739 |
| ADMIN&OP/SALES | 0.1096 | 0.0896 | 0.0741 | 0.0229 | 0.2936 |
| OWNERSHIP STRUCTURE | | | | | |
| STATE OWNERSHIP BEFORE SIP | 0.7548 | 0.8703 | 0.2571 | 0.0054 | 1.0000 |
| STATE OWNERSHIP AFTER SIP | 0.5432 | 0.5990 | 0.1899 | 0.0040 | 0.8786 |
| LEGAL PERSON OWNERSHIP BEFORE SIP | 0.1460 | 0.0280 | 0.2157 | 0.0000 | 0.9946 |
| LEGAL PERSON OWNERSHIP AFTER SIP | 0.1023 | 0.0188 | 0.1506 | 0.0000 | 0.7287 |

Table 4: Correlation Matrix among the Dependent and Explanatory Variables

PUBLIC ALLOCATION is the fraction of shares (A shares) sold to the general public relative to the total number of shares outstanding at SIP-time. ROA is EBIT to total assets whereas LEVERAGE is the book value of total debt divided by total assets in the year preceding SIP. DEBT MIX is is the ratio of short-term and long-term bank loans to total debt. SUBSIDIES is the ratio of subsidies scaled by sales in the year before SIP. MARKET-TO-BOOK is market value of equity (using the offer price) plus book value of debt/book value of total assets. FIRM SIZE is measured by the logarithm of total assets pre-SIP and has been deflated. ADMIN/SALES is the ratio of administrative expenses to total sales. MARKET RETURN is the return on the Shanghai stock exchange in the year before SIP whereas VOLUME is the number of SIPs in the year before SIP scaled by the total number of SIPs. FOREIGN equals one if there was a B or H share issuance before the A share SIP and zero otherwise. REGULATED equals one if the firm is in regulated industry and zero otherwise.

| Variable | PUBLIC ALLOCATION | ROA | LEVERAGE | DEBT MIX | SUBSIDIES | MARKET-TO-BOOK | FIRM SIZE | EFFICIENCY | MARKET RETURN | VOLUME | FOREIGN | REGULATED |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| PUBLIC ALLOCATION | 1.0000 | 0.1251 (0.0078) | 0.1625 (0.0005) | -0.0270 (0.5669) | 0.2209 (0.0000) | 0.1583 (0.0007) | -0.5252 (0.0000) | 0.0601 (0.2026) | -0.0291 (0.5375) | 0.0486 (0.3035) | -0.5625 (0.0000) | -0.0753 (0.1102) |
| ROA | 0.1251 (0.0078) | 1.0000 | -0.0485 (0.3037) | -0.1555 (0.0009) | -0.0089 (0.8510) | 0.6621 (0.0000) | -0.3239 (0.0000) | -0.0520 (0.2706) | 0.0478 (0.3111) | 0.0809 (0.0861) | -0.2116 (0.0000) | -0.0333 (0.4801) |
| LEVERAGE | 0.1625 (0.0005) | -0.0485 (0.3037) | 1.0000 | 0.2210 (0.0000) | -0.0129 (0.7845) | -0.0450 (0.3402) | 0.0310 (0.5117) | -0.0106 (0.8226) | -0.0581 (0.2181) | -0.0038 (0.9362) | -0.1771 (0.0002) | -0.0831 (0.0780) |
| DEBT MIX | -0.0270 (0.5669) | -0.1555 (0.0009) | 0.2210 (0.0000) | 1.0000 | 0.1011 (0.0318) | -0.2579 (0.0000) | 0.0996 (0.0344) | 0.1162 (0.0136) | -0.0366 (0.4376) | -0.0067 (0.8867) | 0.0482 (0.3073) | 0.0503 (0.2863) |
| SUBSIDIES | 0.2209 (0.0000) | -0.0089 (0.8510) | -0.0129 (0.7845) | 0.1011 (0.0318) | 1.0000 | 0.1019 (0.0305) | -0.0182 (0.6993) | 0.1291 (0.0061) | -0.0065 (0.8904) | -0.1246 (0.0081) | -0.0814 (0.0841) | 0.0193 (0.6829) |
| MARKET-TO-BOOK | 0.1583 (0.0007) | 0.6621 (0.0000) | -0.0450 (0.3402) | -0.2579 (0.0000) | 0.1019 (0.0305) | 1.0000 | -0.3551 (0.0000) | 0.0696 (0.1400) | 0.0456 (0.3344) | 0.1077 (0.0221) | -0.0952 (0.0432) | 0.0265 (0.5753) |
| FIRM SIZE | -0.5252 (0.0000) | -0.3239 (0.0000) | 0.0310 (0.5117) | 0.0996 (0.0344) | -0.0182 (0.6993) | -0.3551 (0.0000) | 1.0000 | -0.0598 (0.2051) | -0.0653 (0.1661) | -0.0587 (0.2135) | 0.4281 (0.0000) | 0.0259 (0.5840) |
| ADMIN/SALES | 0.0601 (0.2026) | -0.0520 (0.2706) | -0.0106 (0.8226) | 0.1162 (0.0136) | 0.1291 (0.0061) | 0.0696 (0.1400) | -0.0598 (0.2051) | 1.0000 | -0.1103 (0.0191) | -0.0799 (0.0901) | 0.0852 (0.0707) | 0.0338 (0.4741) |
| MARKET RETURN | -0.0291 (0.5375) | 0.0478 (0.3111) | -0.0581 (0.2181) | -0.0366 (0.4376) | -0.0065 (0.8904) | 0.0456 (0.3344) | -0.0653 (0.1661) | -0.1103 (0.0191) | 1.0000 | 0.2668 (0.0000) | -0.0267 (0.5721) | -0.0402 (0.3949) |
| VOLUME | 0.0486 (0.3035) | 0.0809 (0.0861) | -0.0038 (0.9362) | -0.0067 (0.8867) | -0.1246 (0.0081) | 0.1077 (0.0221) | -0.0587 (0.2135) | -0.0799 (0.0901) | 0.2668 (0.0000) | 1.0000 | 0.0211 (0.6551) | 0.0593 (0.2091) |
| FOREIGN | -0.5625 (0.0000) | -0.2116 (0.0000) | -0.1771 (0.0002) | 0.0482 (0.3073) | -0.0814 (0.0841) | -0.0952 (0.0432) | 0.4281 (0.0000) | 0.0852 (0.0707) | -0.0267 (0.5721) | 0.0211 (0.6551) | 1.0000 | -0.0580 (0.2193) |
| REGULATED | -0.0753 (0.1102) | -0.0333 (0.4801) | -0.0831 (0.0780) | 0.0503 (0.2863) | 0.0193 (0.6829) | 0.0265 (0.5753) | 0.0259 (0.5840) | 0.0338 (0.4741) | -0.0402 (0.3949) | 0.0593 (0.2091) | -0.0580 (0.2193) | 1.0000 0.0000 |

Table 5. Determinants of Public Share Allocation

The dependent variable PUBLIC ALLOCATION is the fraction of shares (A shares) sold to the general public relative to the total number of shares outstanding at SIP-time. ROA is EBIT to total assets whereas LEVERAGE is the book value of total debt divided by total assets in the year preceding SIP. DEBT MIX is the ratio of short-term and long-term bank loans to total debt. SUBSIDIES is the ratio of subsidies scaled by sales in the year before SIP. MARKET-TO-BOOK is market value of equity (using the offer price) plus book value of debt/book value of total assets. FIRM SIZE is measured by the logarithm of total assets pre-SIP and has been deflated. ADMIN/SALES is the ratio of administrative expenses to total sales. MARKET RETURN is the return on the Shanghai stock exchange in the year before SIP whereas VOLUME is the number of SIPs in the year before SIP scaled by the total number of SIPs. FOREIGN equals one if there was a B or H share issuance before the A share SIP and zero otherwise. REGULATED equals one if the firm is in regulated industry and zero otherwise. INDUSTRY DUMMIES control for industry-specific determinants of public allocation and are included when there are at least 10 sample firms in the corresponding industry.

| Panel A: regression results on the total sample of 451 firms | | | | | | |
|--|--------------------|---------|--------------------|---------|--------------------|---------|
| Variable | Parameter estimate | p-value | Parameter estimate | p-value | Parameter estimate | p-value |
| Intercept | 1.0739 | <.0001 | 1.0884 | <.0001 | 1.0562 | <.0001 |
| ROA | -0.1879 | 0.0155 | -0.1617 | 0.0078 | | |
| LEVERAGE | 0.0742 | 0.0028 | 0.0752 | 0.0024 | 0.0789 | 0.0015 |
| DEBT MIX | -0.0112 | 0.4676 | -0.0134 | 0.3713 | -0.0139 | 0.3698 |
| SUBSIDIES | 1.7857 | <.0001 | 1.8218 | <.0001 | 1.8883 | <.0001 |
| MARKET-TO-BOOK | 0.0033 | 0.5861 | | | -0.0059 | 0.2197 |
| FIRM SIZE | -0.0422 | <.0001 | -0.0428 | <.0001 | -0.0417 | <.0001 |
| ADMIN/SALES | 0.0810 | 0.2841 | 0.0831 | 0.2707 | 0.0986 | 0.1929 |
| MARKET RETURN | -0.0206 | 0.1214 | -0.0206 | 0.1202 | -0.0210 | 0.1172 |
| VOLUME | 0.1832 | 0.0143 | 0.1866 | 0.0122 | 0.1838 | 0.0145 |
| FOREIGN | -0.1370 | <.0001 | -0.1357 | <.0001 | -0.1313 | <.0001 |
| REGULATED | -0.0548 | 0.0036 | -0.0543 | 0.0039 | -0.0520 | 0.0059 |
| INDUSTRY DUMMIES | YES | | YES | | YES | |
| Adjusted R ² | 48.88% | | 48.96% | | 48.29% | |
| Panel B: regression results on the first subsample of 214 firms (1994-1998) | | | | | | |
| Variable | Parameter estimate | p-value | Parameter estimate | p-value | Parameter estimate | p-value |
| Intercept | 0.8752 | <.0001 | 0.9605 | <.0001 | | |
| ROA | 0.0420 | 0.5869 | | | | |
| LEVERAGE | 0.0589 | 0.0477 | 0.0593 | 0.0457 | | |
| DEBT MIX | -0.0097 | 0.6265 | -0.0211 | 0.3042 | | |
| SUBSIDIES | 2.1291 | 0.0551 | 2.5440 | 0.0231 | | |
| MARKET-TO-BOOK | | | | | -0.0090 | 0.1855 |
| FIRM SIZE | -0.0357 | <.0001 | -0.0388 | <.0001 | | |
| ADMIN/SALES | 0.0944 | 0.3558 | 0.0946 | 0.3530 | | |
| MARKET RETURN | -0.0027 | 0.8875 | -0.0061 | 0.7502 | | |
| VOLUME | 0.3479 | 0.0004 | 0.3874 | <.0001 | | |
| FOREIGN | -0.1224 | <.0001 | -0.1212 | <.0001 | | |
| REGULATED | -0.0641 | 0.0024 | -0.0633 | 0.0026 | | |
| INDUSTRY DUMMIES | YES | | YES | | YES | |
| Adjusted R ² | 54.92% | | 55.25% | | | |

| <i>Panel C: regression results on the second subsample of 237 firms (1999-2002)</i> | | | | |
|---|--------------------|-----------------|--------------------|-----------------|
| Variable | Parameter estimate | <i>p</i> -value | Parameter estimate | <i>p</i> -value |
| Intercept | 1.5166 | <.0001 | 1.6065 | <.0001 |
| ROA | -0.2319 | 0.0037 | | |
| LEVERAGE | 0.0310 | 0.3302 | 0.0398 | 0.2014 |
| DEBT MIX | 0.0041 | 0.8145 | -0.0078 | 0.6521 |
| SUBSIDIES | 0.3101 | 0.3859 | 0.3286 | 0.3496 |
| MARKET-TO-BOOK | | | -0.0213 | <.0001 |
| FIRM SIZE | -0.0620 | <.0001 | -0.0662 | <.0001 |
| ADMIN/SALES | 0.0285 | 0.7309 | 0.0563 | 0.4871 |
| MARKET RETURN | 0.0150 | 0.3526 | 0.0284 | 0.0757 |
| VOLUME | 0.1033 | 0.3052 | 0.1909 | 0.0523 |
| FOREIGN | -0.1166 | <.0001 | -0.1063 | <.0001 |
| REGULATED | -0.0252 | 0.1825 | -0.0208 | 0.2626 |
| INDUSTRY DUMMIES | YES | | YES | |
| Adjusted R ² | 57.05% | | 58.60% | |

Table 6. Determinants of the Likelihood of Selling a Majority Stake at SIP-time

The dependent variable is a dummy variable that equals one if government ownership (direct and indirect via state-owned legal person shares) decreases below 50% at SIP-time and zero otherwise. ROA is EBIT to total assets whereas LEVERAGE is the book value of total debt divided by total assets in the year preceding SIP. DEBT MIX is the ratio of short-term and long-term bank loans to total debt. SUBSIDIES is the ratio of subsidies scaled by sales in the year before SIP. MARKET-TO-BOOK is market value of equity (using the offer price) plus book value of debt/book value of total assets. FIRM SIZE is measured by the logarithm of total assets pre-SIP and has been deflated. ADMIN/SALES is the ratio of administrative expenses to total sales. MARKET RETURN is the return on the Shanghai stock exchange in the year before SIP whereas VOLUME is the number of SIPs in the year before SIP scaled by the total number of SIPs. FOREIGN equals one if there was a B or H share issuance before the A share SIP and zero otherwise. REGULATED equals one if the firm is in regulated industry and zero otherwise. INDUSTRY DUMMIES control for industry-specific determinants of public allocation and are included when there are at least 10 sample firms in the corresponding industry.

| Logit Regression Result on 368 firms (62 firms have government ownership lower than 50% after their SIP) | | |
|---|--------------------|-----------------|
| Variable | Parameter estimate | <i>p</i> -value |
| Intercept | 15.4582 | 0.0017 |
| ROA | -0.4689 | 0.8997 |
| LEVERAGE | 1.316 | 0.2615 |
| DEBT MIX | -0.612 | 0.4082 |
| SUBSIDIES | 29.5639 | 0.0695 |
| MARKET-TO-BOOK | -0.6932 | 0.0302 |
| FIRM SIZE | -0.8567 | 0.0004 |
| ADMIN/SALES | -1.8812 | 0.6012 |
| MARKET RETURN | 0.2637 | 0.6816 |
| VOLUME | 3.2910 | 0.3573 |
| FOREIGN | 1.9534 | 0.0062 |
| REGULATED | 0.9893 | 0.1395 |
| INDUSTRY DUMMIES | YES | |
| AIC | 340.566 | |
| Likelihood Ratio | -154.283 | |
| Pseudo R ² | 11.09% | |

Table 7. Correlation Matrix among the Dependent and Explanatory Variables in regression on determinants of underpricing

UNDERPRICING is the first-day stock return (over offer price) minus the corresponding Shanghai stock market return. LEVERAGE is the book value of total liabilities divided by total assets in the year preceding SIP. DEBT MIX is the ratio of short-term and long-term bank loans to total debt pre-SIP. MARKET-TO-BOOK is market value of equity plus book value of debt/book value of total assets. MARKET RETURN is the market return of Shanghai stock exchange in the year preceding SIP. VOLUME is the number of SIPs in the year preceding SIP scaled by total number of SIPs. LISTINGLAG is the logarithm of the days elapsed between the start of share offering between the actual share listing. PREALLOCATION equals 1 if the pre-allocation happened and zero otherwise. REGULATED equals one if the firm is in regulated industry and zero otherwise. FOREIGN equals one if there was B or H share issuance before A share SIP and zero otherwise. Figures in parentheses are p-values.

| VARIABLE | UNDERPRICING | LEVERAGE | DEBT MIX | MARKET-TO-BOOK | FIRM SIZE | MARKET RETURN | VOLUME | LISTINGLAG | PREALLOCATION | FOREIGN | REGULATED |
|-----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| UNDERPRICING | 1.0000 | -0.0027 (0.9551) | 0.0532 (0.2599) | -0.1076 (0.0223) | -0.3660 (0.0000) | 0.1926 (0.0000) | 0.1273 (0.0068) | 0.0614 (0.1930) | -0.1680 (0.0003) | -0.1318 (0.0050) | 0.0040 (0.9328) |
| LEVERAGE | -0.0027 (0.9551) | 1.0000 | 0.2210 (0.0000) | -0.0450 (0.3402) | 0.0310 (0.5117) | -0.0581 (0.2181) | -0.0038 (0.9362) | -0.1983 (0.0000) | -0.0120 (0.7993) | -0.1771 (0.0002) | -0.0831 (0.0780) |
| DEBT MIX | 0.0532 (0.2599) | 0.2210 (0.0000) | 1.0000 | -0.2579 (0.0000) | 0.0996 (0.0344) | -0.0366 (0.4376) | -0.0067 (0.8867) | -0.0269 (0.5688) | 0.0277 (0.5572) | 0.0482 (0.3073) | 0.0503 (0.2863) |
| MARKET-TO-BOOK | -0.1076 (0.0223) | -0.0450 (0.3402) | -0.2579 (0.0000) | 1.0000 | -0.3551 (0.0000) | 0.0456 (0.3344) | 0.1077 (0.0221) | -0.1917 (0.0000) | -0.0473 (0.3158) | -0.0952 (0.0432) | 0.0265 (0.5753) |
| FIRM SIZE | -0.3660 (0.0000) | 0.0310 (0.5117) | 0.0996 (0.0344) | -0.3551 (0.0000) | 1.0000 | -0.0653 (0.1661) | -0.0587 (0.2135) | 0.1818 (0.0001) | 0.2541 (0.0000) | 0.4281 (0.0000) | 0.0259 (0.5840) |
| MARKET RETURN | 0.1926 (0.0000) | -0.0581 (0.2181) | -0.0366 (0.4376) | 0.0456 (0.3344) | -0.0653 (0.1661) | 1.0000 | 0.2668 (0.0000) | 0.1785 (0.0001) | -0.0276 (0.5589) | -0.0267 (0.5721) | -0.0402 (0.3949) |
| VOLUME | 0.1273 (0.0068) | -0.0038 (0.9362) | -0.0067 (0.8867) | 0.1077 (0.0221) | -0.0587 (0.2135) | 0.2668 (0.0000) | 1.0000 | -0.2110 (0.0000) | -0.2973 (0.0000) | 0.0211 (0.6551) | 0.0593 (0.2091) |
| LISTINGLAG | 0.0614 (0.1930) | -0.1983 (0.0000) | -0.0269 (0.5688) | -0.1917 (0.0000) | 0.1818 (0.0001) | 0.1785 (0.0001) | -0.2110 (0.0000) | 1.0000 | 0.1683 (0.0003) | 0.1625 (0.0005) | -0.0165 (0.7270) |
| PREALLOCATION | -0.1680 (0.0003) | -0.0120 (0.7993) | 0.0277 (0.5572) | -0.0473 (0.3158) | 0.2541 (0.0000) | -0.0276 (0.5589) | -0.2973 (0.0000) | 0.1683 (0.0003) | 1.0000 | 0.0170 (0.7194) | -0.0507 (0.2830) |
| FOREIGN | -0.1318 (0.0050) | -0.1771 (0.0002) | 0.0482 (0.3073) | -0.0952 (0.0432) | 0.4281 (0.0000) | -0.0267 (0.5721) | 0.0211 (0.6551) | 0.1625 (0.0005) | 0.0170 (0.7194) | 1.0000 | -0.0580 (0.2193) |
| REGULATED | 0.0040 (0.9328) | -0.0831 (0.0780) | 0.0503 (0.2863) | 0.0265 (0.5753) | 0.0259 (0.5840) | -0.0402 (0.3949) | 0.0593 (0.2091) | -0.0165 (0.7270) | -0.0507 (0.2830) | -0.0580 (0.2193) | 1.0000 |

Table 8. Determinants of Underpricing

UNDERPRICING is the first-day stock return (over offer price) minus the corresponding Shanghai stock market return. LEVERAGE is the book value of total liabilities divided by total assets in the year preceding SIP. DEBT MIX is the ratio of short-term and long-term bank loans to total debt pre-SIP. MARKET-TO-BOOK is market value of equity plus book value of debt/book value of total assets. FIRM SIZE is the logarithm of total assets in the year preceding SIP and has been deflated. MARKET RETURN is the market return of Shanghai stock exchange in the year preceding SIP. VOLUME is the number of SIPs in the year preceding SIP scaled by total number of SIPs. LISTINGLAG is the logarithm of the number of days elapsed between the start of share offering between the actual share listing. PREALLOCATION equals 1 if the pre-allocation happened and zero otherwise. REGULATED equals one if the firm is in regulated industry and zero otherwise. FOREIGN equals one if there was B or H share issuance before A share SIP and zero otherwise. INDUSTRY DUMMIES control for industry-specific determinants of underpricing and are included when there are at least 10 sample firms in the corresponding industry.

| <i>Panel A: regression results on the total sample of 451 firms</i> | | |
|--|--------------------|---------|
| Variable | Parameter estimate | p-value |
| INTERCEPT | 8.9123 | <.0001 |
| LEVERAGE | -0.0358 | 0.8871 |
| DEBT MIX | 0.1127 | 0.4592 |
| MARKET-TO-BOOK | -0.3001 | <.0001 |
| FIRM SIZE | -0.3831 | <.0001 |
| MARKET RETURN | 0.3569 | 0.0092 |
| VOLUME | 1.5003 | 0.0617 |
| LISTINGLAG | 0.1127 | 0.0611 |
| PREALLOCATION | -0.0989 | 0.3165 |
| FOREIGN | -0.0007 | 0.9960 |
| REGULATED | -0.0379 | 0.8401 |
| INDUSTRY DUMMIES | YES | |
| Adjusted R ² | 28.60 % | |
| <i>Panel B: regression results on the first subsample of 214 firms (1994-1998)</i> | | |
| Variable | Parameter estimate | p-value |
| INTERCEPT | 6.2256 | <.0001 |
| LEVERAGE | 0.3667 | 0.2961 |
| DEBT MIX | 0.1407 | 0.5400 |
| MARKET-TO-BOOK | -0.1822 | 0.0242 |
| FIRM SIZE | -0.3300 | <.0001 |
| MARKET RETURN | 0.6306 | 0.0040 |
| VOLUME | 2.7243 | 0.0164 |
| LISTINGLAG | 0.3714 | <.0001 |
| PREALLOCATION | -0.0875 | 0.6703 |
| FOREIGN | 0.1631 | 0.3843 |
| REGULATED | 0.0462 | 0.8449 |
| INDUSTRY DUMMIES | YES | |
| Adjusted R ² | 29.43 % | |

| <i>Panel C: regression results on the second subsample of 237 firms (1999-2002)</i> | | |
|---|---------|--------|
| INTERCEPT | 13.8132 | <.0001 |
| LEVERAGE | -0.2616 | 0.4256 |
| DEBT MIX | 0.2269 | 0.2079 |
| MARKET-TO-BOOK | -0.4254 | <.0001 |
| FIRM SIZE | -0.5715 | <.0001 |
| MARKET RETURN | 0.6907 | 0.0002 |
| VOLUME | 2.2733 | 0.0507 |
| LISTINGLAG | -0.1175 | 0.1771 |
| PREALLOCATION | -0.1187 | 0.3050 |
| FOREIGN | 0.0558 | 0.7736 |
| REGULATED | -0.2487 | 0.2049 |
| INDUSTRY DUMMIES | YES | |
| Adjusted R ² | 45.29% | |

Table 9. Determinants of Public Share Allocation and Underpricing – 3SLS Model

UNDERPRICING is the first-day stock return (over offer price) minus the corresponding Shanghai stock market return. PUBLIC ALLOCATION is the fraction of shares (A shares) sold to the general public relative to the total number of shares outstanding at SIP-time. ROA is EBIT to total assets whereas LEVERAGE is the book value of total debt divided by total assets in the year preceding SIP. DEBT MIX is the ratio of short-term and long-term bank loans to total debt. SUBSIDIES is the ratio of subsidies scaled by sales in the year before SIP. MARKET-TO-BOOK is market value of equity (using the offer price) plus book value of debt/book value of total assets. FIRM SIZE is measured by the logarithm of total assets pre-SIP and has been deflated. ADMIN/SALES is the ratio of administrative expenses to total sales. MARKET RETURN is the market return of Shanghai stock exchange in the year preceding SIP. VOLUME is the number of SIPs in the year preceding SIP scaled by total number of SIPs. LISTINGLAG is the logarithm of the number of days elapsed between the start of share offering and the actual share listing. PREALLOCATION equals 1 if the pre-allocation happened and zero otherwise. REGULATED equals one if the firm is in regulated industry and zero otherwise. FOREIGN equals one if there was B or H share issuance before A share SIP and zero otherwise. INDUSTRY DUMMIES control for industry-specific determinants of public allocation and underpricing, and are included when there are at least 10 sample firms in the corresponding industry.

| Dependent Variable: PUBLIC ALLOCATION | | | Dependent Variable: UNDERPRICING | | |
|---------------------------------------|--------------------|---------|----------------------------------|--------------------|---------|
| Variable | Parameter estimate | p-value | Variable | Parameter estimate | p-value |
| INTERCEPT | 1.9202 | 0.0012 | INTERCEPT | 0.6658 | 0.7980 |
| UNDERPRICING | -0.0878 | 0.1415 | PUBLIC ALLOCATION | 7.4149 | 0.0004 |
| ROA | -0.3342 | 0.0185 | | | |
| LEVERAGE | 0.0625 | 0.0616 | LEVERAGE | -0.5247 | 0.1221 |
| DEBT MIX | -0.0091 | 0.6554 | DEBT MIX | 0.1286 | 0.4919 |
| SUBSIDIES | 2.9433 | 0.0018 | | | |
| MARKET-TO-BOOK | -0.0195 | 0.2650 | MARKET-TO-BOOK | -0.2679 | <.0001 |
| FIRM SIZE | -0.0769 | 0.0017 | FIRM SIZE | -0.0695 | 0.5069 |
| ADMIN/SALES | 0.0894 | 0.3665 | | | |
| MARKET RETURN | 0.0148 | 0.6178 | MARKET RETURN | 0.4806 | 0.0052 |
| VOLUME | 0.3359 | 0.0188 | VOLUME | 0.5470 | 0.5914 |
| | | | LISTINGLAG | 0.1826 | 0.0172 |
| | | | PREALLOCATION | -0.2258 | 0.0732 |
| FOREIGN | -0.1337 | <.0001 | FOREIGN | 0.9802 | 0.0027 |
| REGULATED | -0.0598 | 0.0163 | REGULATED | 0.3153 | 0.2107 |
| INDUSTRY DUMMIES | YES | | INDUSTRY DUMMIES | YES | |
| Adjusted R ² | 34.88% | | Adjusted R ² | 21.46% | |