Determinants of IPO Gross Spreads: Evidence from China*

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August 12, 2013

ABSTRACT

We examine the fees charged by underwriters for conducting IPOs in China. By examining a sample of Chinese IPOs conducted during 2001-2011 (during which regulatory reforms took place regarding the listing process and pricing method of IPOs), we obtain the first evidence from China on the direct issue cost, the gross spreads, and identify its determinants, including issue proceeds, number of lead managers, and lead manager reputation. The results show a pattern of over-time increase of the spreads, which is at 0.16 percentage points per year for state-owned enterprise (SOE) offerings and 0.73 percentage points per year for non-SOE ones. The gross spreads do not exhibit clustering, but are largely consistent with increased demand for underwriting services from non-SOEs that, together with increased complexity of underwriting, has pushed underwriting fees up.

Key words: IPOs, Investment Banks, Fees, Underpricing

JEL: G32; G34

* We thank the seminar participants at the University of Hong Kong for helpful comments and suggestions.

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1. Introduction

The process of initial public offering (IPO) involves considerable direct and indirect costs. The gross spreads present the major component of direct costs, which are the fees paid to investment banks for providing the underwriting services and bearing the issuance risk. On the other hand, as "the money left on the table," the underpricing of new issues presents the major component of indirect costs to the issuer. In this study, by using a sample of Chinese IPOs, we examine the gross spreads and underpricing in the Chinese IPO market, with an emphasis on the former.

In his pioneering work, Ritter (1987) examines U.S. IPOs from 1977 to 1982 and finds that the direct investment banking fees, given offer size, are surprisingly close in the levels among different underwriting contracts. Chen and Ritter (2000) further report that more than 90 percent of moderate-sized IPOs from the period of 1985-1998 were charged with gross spreads of almost exactly 7%, which is referred to as the 7% solution. From this finding the implication of insufficient competition among underwriters even caused an investigation by the U.S. Department of Justice into possible collusive behaviors of investment banks. In a more recent study, Abrahamson, Jenkinson and Jones (2011) confirm that the 7% solution had remained unchanged after 20 years of Ritter's finding and even become more prevalent despite of the entry of foreign underwriters and reduced number of IPOs in more recent years. On the other hand, evidence from international markets shows that IPO gross spreads, while varying from area to area, do not display strong clustering (Torstila, 2003). The spreads in most European countries do not cluster at any levels.[2]

From an important emerging market in its transitional period, Chinese IPOs provide a

[2] A few studies have also examined various factors affecting the gross spreads, which include institutional arrangements, pricing methods, underwriting syndicate structure, issue size, and issuer characteristics (see, e.g., Ljungqvist, Jenkinson, and Wilhelm, 2000; Torstila (2001); Ljungqvist, Jenkinson, and Wilhelm, 2003).

unique experiment for us to examine new issue costs. China's capital market has gone through several important reforms during past two decades, and both the listing process and pricing method of IPOs have dramatically changed during this period. The new issue listing process has evolved from the heavily regulated quota system in the early stage (before 2001), to the less regulated approval system (2001-2005), and then to the current sponsor system with much of the regulatory constraints removed.[3] Along with this development, the pricing method has also changed substantially from the regulated price-to-earnings (P/E) approach (before 1998) to the current price inquiry mechanism since 2005 when all IPOs in China began to use the bookbuilding underwriting method.

Another unique feature of the Chinese market is that there are two distinct groups of firms: state owned enterprises (SOEs) and non-SOEs. Given significant differences in ownership structure and managerial motivation between the two groups, it is widely believed that the SOEs are subject to more serious agency problems. When agency costs play a role in IPOs, the issue costs might also change. Therefore, it is interesting to examine whether and how the issuing costs differ between SOE and non-SOE IPOs.

A few studies have examined the regulatory effects of China's capital market reforms on IPO pricing. Huyghebaert and Quan (2009) document the change in underpricing of SOE IPOs after the abolishment of the quota system. Fei (2009) examines whether the introduction of the bookbuilding method reduces the level of underpricing. However, no study has

[3] In the early stage, the Chinese government stressed the role of the stock market in raising capital for state owned enterprises and aimed to reduce government subsidies to the SOEs and improve management efficiency. During the period from 1993 to 2001, a quota system was adopted to control the total number of IPOs each year. In 2001, the quota system was replaced by an approval system, under which qualified underwriters are assigned a fixed number of "channels" to take the firms of their choice to go public. The approval system substantially reduced government's control over new issues, although the final decision on a firm's listing was still made by China Securities Regulatory Committee (CSRC). Since 2005, the current Sponsor System was enacted, which further removes regulatory constraints on IPOs. Under this system, qualified investment banks (the sponsors) only need to recommend potential issuers to CSRC and assist them to comply with the listing requirements.

examined the gross spreads of Chinese IPOs. It remains unclear how the cost of public offering has changed since the use of the bookbuilding method in IPO underwriting.

By documenting the first evidence on the gross spreads of Chinese IPOs, our study supplements the existing literature with new international evidence from an increasingly important emerging market. Our sample consists of 1,171 IPOs during the years 2001-2011. Our major findings include the following: First, the gross spreads of Chinese IPOs do not exhibit clustering. After controlling for various IPO and market variables, the spreads show considerable variations. This finding is consistent with existing international evidence that IPO gross spreads do not exhibit strong clustering in international IPOs outside the U.S. market.

Second, there is an increasing trend in the gross spreads of Chinese IPOs throughout the sample period. This trend coincides with the development of the IPO pricing method in this period in China. In the early stage, the pricing of new issues was strictly regulated and the method was simple, and even mechanical, under the fixed P/E ratio requirement. As the IPO market becomes less regulated and more market oriented, IPO pricing has become increasingly more rigorous and sophisticated. Increasingly higher standard for underwriting services along with the entry of foreign bulge-bracket banks that charge higher fees appear to have increased the cost of underwriting business in China. We find a steady increasing trend of IPO gross spreads since 2006 when all IPOs began to use bookbuilding underwriting.

Third, there are significant differences in the pattern of gross spreads between SOEs and non-SOEs. In the period 2001-2005, SOE IPOs are associated with lower spreads than those of non-SOE IPOs. One possible reason for this difference is that competition among underwriters for SOE new issues was greater because SOEs were more attractive due to larger deal sizes and possibly being more popular to investors. In the later period 2006-2011, while

the increasing trend of gross spreads was attenuated with SOEs, it became intensified with non-SOEs. As a result, the average spread of non-SOEs in these years rises to 5.3%, which is significantly higher than the SOE counterpart of 3.4%. Our results indicate that the issue proceeds, the number of bookrunners, and bookrunner reputation are important factors in the determination of the gross spread.

Forth and the last, the first-day returns show a generally decreasing trend during the sample period. This trend is consistent with the pattern of the Chinese IPO market development, which has changed considerably from the initially strictly regulated system toward the current, market-oriented system. Our result shows some interesting association between IPO initial return and gross spread during the period 2001-2005: the initial return declines with the gross spread. This association seems to suggest a substitutive relationship between them. However, this effect is only significant with non-SOEs and is not observed for the period 2006-2011. This finding is thus insufficient for us to draw a conclusion.

The remainder of this paper is organized as follows. Section 2 reviews the literature of new issue costs and describes the regulatory background of the Chinese IPO market. Section 3 describes the sample and data. Section 4 presents the empirical results, focusing on the determination of IPO gross spreads and initial returns. Section 5 concludes the paper.

2. Background

2.1. Literature

Ritter (1987) defines the cost of firms' going public as direct expenses and indirect underprising. From a sample of U.S. IPOs of the years 1977-1982, he finds that the direct investment banking fees are of the same level, given the size of the offer, for both best-effort contracts and firm-commitment contracts.

Chen and Ritter (2000) further examine firm-commitment IPOs from the period of 1985-1998 and find that more than 90 percent of IPOs with gross spreads between $20 million to $80 million almost paid a gross spread at exact 7% of the proceeds. The spreads clustering became even stronger than a decade ago. They argue that their finding is consistent with implicit collusion or strategic pricing: underwriters do not compete on price but manage to sustain a high gross spread by providing analysts' coverage and industry expertise as means for product differentiation. They however also note that other factors such as potential entry of commercial banks into the IPO market and some newly incorporated banks might also contribute to the 7%-underwriting fees strategy.

Torstila (2003) uses a sample of 11,000 new issues from Asian Pacific, European and North American markets to examine IPO gross spreads outside the U.S. market. He shows that the pattern of gross spreads outside the U.S. is quite different and varies from area to area. Specifically, gross spreads tend to cluster at 2.5% in Hong Kong, India and Singapore, 2% in Malaysia, and 2.5% to 4% in Germany, French, and Belgium. However, in these areas, spreads clustering occurs at much lower levels and is more severe in countries with even lower levels of the spreads. The evidence does not necessarily suggest collusion in those areas but make the 7% gross spreads in U.S. seem particularly suspect as a strategic pricing.

As the gross spreads in most countries outside U.S. does not display strong clustering, Ljungqvist, Jenkinson, and Wilhelm (2000) analyzed factors that may systematically influence IPO gross spreads and the relation between IPO gross spreads and underpricing. They use around 1,000 book-building efforts and 600 fixed-price offers for 61 countries outside the U.S. and report average gross spreads of 4.6 percent for bookbuilding efforts and 2.2 percent for fixed price offerings. They find that U.S. banks are charging higher fees in bookbuilding and investigate the hypothesis that higher direct costs reflect higher quality

services in the accuracy of the IPO prices. The results suggest that bookbuilding generally lead to more accurate pricing but only when U.S. underwriters and investors are included. Also, if the issuers charged with a higher gross spread from U.S. underwriters were to switch to a cheaper, non-U.S. underwriter, 90% of them would worse off in that the additional cost in underpricing would exceed the savings on spreads. Similarly, as bookbuilding was quickly spreading in the areas outside the U.S., Ljungqvist, Jenkinson and Wilhelm (2003) use a sample of 2436 IPOs from 65 countries and find that including a U.S. underwriter in the senior position of the underwriting syndicate will lead to greater fees paid to the underwriters but also will be less underpriced. For most issuers, the gains associated with lower underpricing outweigh the additional costs associated with hiring U.S. banks. Their work again, suggested a quality/price trade-off.

Sami (2001), focus on a number of factors that determine IPO gross spreads in European markets. The result suggests that the privatization IPOs are charged much lower gross spreads and the reason lies in the bargaining power of the national governments and the more intensified competition among investment banks to underwrite those privatization IPOs. Also, consistent with Ljungqvist et al. (2000), the result shows that U.S. bulge bracket banks are charging higher fees. And using multiple bookrunners leads to lower fees as a possible result of the intense competition for the IPO deal. This paper also shows that there is an nondecreasing trend in gross spreads and suggests further research questions such as the evolution of gross spreads as a country's privatization gradually unfolds.

Abrahamson, Jenkinson and Jones (2011) compare fees charged by investment banks for conducting IPOs in the United States and Europe. They find that charging 7% gross spreads for IPOs in U.S. market had become even more prevalent after Chen and Ritter (2000)'s evidence. The clustering is spreading to IPOs with larger proceeds. 77% of IPOs between

$100 million and $250 million are charging 7% spreads during 1998-2007 while, in Chen & Ritter (2000), no IPOs larger than $150 million are charged such high spreads. On the other hand, the gross spreads for IPOs in European markets are not clustered at any level, much more variable and falling. Having noticed that underwriters with up to 70% market share in the two markets are almost same banks, the 3% wedge between the two areas cannot be explained by issue type, legal costs, litigation risk, sell-side analysts and underpricing. Thus, their evidence is consistent with strategic pricing in the U.S. and their result is meaningful in strengthening the negotiating position of U.S. issuers.

Compared to the direct cost of IPO, there has been a more lengthy literature regarding the indirect cost of going public: IPO underpricing. Rock (1986) explains underpricing with information asymmetry. He shows that underpricing is necessary to induce uninformed investors to participate in IPO offerings when faced with adverse-selection by informed investors. Consistent with this information asymmetry explanation, Betty and Ritter (1986) argue that smaller issuers are subject to more uncertainty and find that the issue size is negatively related to IPO initial return. Also, Carter and Manaster (1990) find that in the 1980's IPOs underwritten by high-quality underwriters have lower levels of underpricing. They argue that underwriters use their reputation to certify IPOs to reduce information asymmetry or uncertainty.

Benveniste and Spindt (1989) develop the pricing model during bookbuilding process focusing on the critical role that informed investors play in setting the offer price. They show that the bookrunner use underpricing and a larger allocation to reward the informed investors who disclose favorable information of the issuing firm. Hanley (1993) gave the first empirical evidence of bookbuilding. She finds that underwriters do not fully adjust their pricing upward to keep underpricing constant when demand is strong. Loughran and Ritter (2002) find that

the stock market returns before IPO issuance have a positive impact on IPO initial returns and use the prospect theory to explain that underwriters only partially adjust offer price on market momentum.

Beatty and Welch (1996), Cooney, Singh, Carter, and Dark (2001), show that a negative relation between underwriter prestige and underpricing in the 1980s reversed itself in the 1990s, although the authors offer no explanation for the reversal. And after viewing that the underpricing increased significantly during 1990s, Loughran & Ritter (2004) stressed the changing objective function of issuing firms and posited the spinning and analyst lust explanations for the high underpricing. Liu & Ritter (2011) further addressed the analyst lust problem, and show that more reputable banks are always affiliated with *II* star analysts and the excess underpricing is paid to the coverage.

Jones et al. (1999) stress the privatization issue. They speculate that governments deliberately underprice privatization offers to reduce syndicates' underwriting risk and potentially reduce the underwriting fee. Ljungqvist et.al (2003), Torstila (2003), and Abrahamson et. al (2011) all show that privatization deals are charged less gross spreads.

A recent work by Hu and Ritter (2007) addresses the impact of the number of bookrunners on underpricing and gross spreads. They find that, back to 1996, every single U.S. IPO had a sole bookrunner while, in 2005, over 50% of U.S. IPOs had multiple bookrunners. And the usage of multiple bookrunner results in a relatively high file price range and high offer price relative to the first-day closing market price. They state that the appearance of multiple bookrunners in recent years can be explained by the larger issue size and the significantly reduced amount of IPO business after 2000.

Besides, there is an increasing debate in the literature as whether the book-building method is less or more efficient than other methods, such as auction, and fixed price offering.

Jenkinson and Ljungqvist (2001), Ritter (2003), and Ljungqvist et al. (2003) state that the bookbuilding method is more time-consuming compared to the fixed price method, resulting in higher direct costs and less underpricing. Sherman (2005) and Abrahamson et. al (2011) show that the U.S. book building method has become increasingly popular over the last decade. However, the superiority of bookbuilding over auction is not arguable. Derrien and Womack (2003) state that the auction is associated with less underpricing and lower variance of underpricing compared to fixed pricing offering and bookbuilding.

There is also a number of evidence from China's IPO market. Mok and Hui (1998) find that the ex ante risk and the equity retention by the state are the key determinants of IPO underpricing in China. Su and Fleisher (1999) use the signaling model to show that the Chinese IPO underpricing is a strategy for firms to signal their value to investors. They also find that IPO underpricing under the auction mechanism is much lower than under the fixed price mechanism. Tian (2003) argues that the IPO quota and price caps imposed by the government are major determinants of IPO underpricing. Chen et al. (2004) show when state ownership is high, agency costs increase and greater underpricing is required to compensate investors for their increased risk exposure. For the potential changes in IPO pricing in different regulatory regimes, Huyghebaert and Quan (2009) examine the changes in IPO underpricing of SOEs after the abolishment of the quota system. Fei (2009) examines whether the introduction of the bookbuilding method reduces the level of IPO underpricing. A recent study by Gao (2011) examines the IPO price and long-run performance in China after the adoption of the book-building pricing mechanism and separate the IPO initial returns into pre-market underpricing and aftermarket overpricing. Strong evidence supporting the behavioral argument is shown in China's IPO market. However, no study has examined the gross spreads of Chinese IPOs. And it remains unclear how the cost of public offering has changed after the

use of the bookbuilding underwriting method in China.

2.2 The IPO market in China

At the early stages of the stock markets in mainland China, its main function was to raise fund for the SOEs which had tight budgets. From 1990 to 2001, the quota system was adopted, in which there was an upper bound on the total number of IPOs each year set by the Chinese government. The government allocated the quotas to the provinces and municipalities. And the local government of the provinces and municipalities decided which firms should go public. As a result, the supply of IPOs in China under the quota system was strictly controlled and restricted. And the restriction on supply led to the over demand for newly issued shares, which was one reason behind the typically extremely high first-day returns.

The quota system was abandoned in 2001 and the recommendation and approval system was established. Under this recommendation system, there is no upper bound limit on the number of IPOs allocated to areas any more. However, as the first stage of the new system, between 2001-2004, the channel system was operating. Under the channel system, qualified underwriters are assigned a fixed number of channels to recommend firms of their choice. Although the decision of recommending firms was delegated to the underwriters, the number of IPOs was still limited by the number of channels existing. As one channel could take only one firm at a time, it significantly reduced the competitive efficiency between underwriters and prolonged the time during the recommendation and approval process. Finally in 2004, the sponsor system was established as the second stage under recommendation and approval system. The channels are removed and qualified investment banks, the sponsors, recommend potential issuers to CSRC without any explicit restrictions and assist issuers to comply with the listing requirements. Although the final decision is still made by the CSRC, the extent of

central planning and regulatory limitation under sponsor system has been significantly reduced compared to the former systems.

Moreover, as China participated into World Trade Organization (WTO) in 2002, the demand of opening the securities market for foreign banks and investors had to be met. The CSRC formulated the Rules for Foreign-shared Securities Companies, which allows the establishment of the co-funded foreign-shared securities companies for foreign investment banks. However, the shares held by the foreign funders in foreign-shared securities companies cannot exceed one third. This proportion of foreign shares was mended to 49% in June 2012. There are 11 such foreign-shared securities companies in the underwriting industry of China since 2002.

The pricing method of IPOs also has changed substantially over time. From 1990 to 1999, the fixed pricing mechanism was adopted for determining all the prices of IPO firms. For the year 2000 and 2001, an auction system was adopted and the price was mainly bid by individual investors. However, the over speculation among individual investors caused huge first day returns and the finally abandonment of the auction system. After several such attempts to abolish the regulatory constraints on IPO pricing while avoiding speculation behavior, the price inquiry mechanism was finally established in 2005 and since then all IPOs in China have used the bookbuilding underwriting method.

3. Data and Sample

My sample includes all IPOs listed as A-shares in Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZE). The data are obtained from GTA CSMAR IPO database and stock prices database. The data in GTA run from 1991 to 2011 including 2,126 A-share IPOs since the establishment of China's stock markets. The IPO gross spread is the key

variable in our study, and our sample depends on the data available on this variable. Table I presents the annual number of total IPOs and the number of IPOs with gross spread data during the period of 1991 to 2011. As issuing firms were not required to disclose their underwriting fees before 2006, the coverage of gross spread data is pretty low before 2001. Until May 18, 2006, CSRC released the Notice of Public Offering of Securities Disclosure of Information Content and Format Guidelines No.1 - Prospectus, which required issuing firms to disclose fees paid to intermediaries for the first time. Given the very limited observations of gross spreads during 1999-2000 and noting the tight regulatory constraints on IPO pricing, we confine our sample to the IPOs in the period of 2001-2011.

Table II presents summary statistics for selected variables of Our sample. The annual total number of IPOs ranges from a low level of 15 in 2005 to a high of 347 in 2010. It is a little contra-intuitive that after the abolishment of quota system, the number of IPOs does not increase significantly until 2009. The reason lies in that, under the recommendation and approval system, the final decision is still made by CSRC. Although the total number of IPOs is not planned by government anymore, there still exist considerable interventions from the regulator based on its concern on the macroeconomic condition, the supply-demand of the market and the needs of SOEs.

A well known conduct among such intervention is the suspension on IPO activities. As the depth of China's stock market is not comparable to the developed stock markets, as long as the performance of stock market is disappointing, the government is inclined to suspend the IPO activity[4]. Figure 1 illustrates the relation between the number of IPOs and stock market returns on monthly basis showing three suspensions after 2001. First, Aug 2004 – Jan 2005,

[4] See Sun et. al (2004). Large A-share IPOs of Chinese state-owned enterprises reduce market turnover significantly, while the listings of larger-scaled H-shares in Hong Kong do not have the similar impact to Hong Kong stock markets.

second May 2005 – June 2006, and third, Sep 2008 – July 2009. However, the reasons for the suspensions are not merely the dropping stock prices. The split share reform during 2005 and 2006 was the main reason for the second suspension, which aimed to switch non-tradable shares in SOEs into tradable shares and restructure the ownership.

In 2009, the establishment of Growth Enterprises Market (GEM) in SZE facilitates more young riskier and smaller firms to get listed. As a result, the number of IPOs increased since 2009 and peaked in 2010. For the last three year in the sample, the IPOs listed in SZE-GEM comprise more than 30% of total IPOs.

The gross spread of an IPO is calculated as the total underwriting fees and sponsor fees divided by the total IPO proceed, presented as a percentage[5]. Figure 2 plots the gross spreads against the logarithm of proceeds in 2012 U.S. dollars. It shows that, first, there is no clustering of IPO spreads in China at any level and there is considerable variation in IPO spreads in China. Table II shows the considerable variation in gross spreads each year. Second, the range of gross spreads is larger than that of U.S. and European markets (see, e.g., Abrahamson, Jenkinson, and Jones, 2011), where the gross spreads are bounded by 7% in European countries and seldom exceed 7% in U.S.. However, in China, the highest gross spread is about 14%[6].

Second, Table II shows an increasing trend in mean gross spread from 2.3% in 2001 to over 5% in 2005. Though drop in 2006 to 4.3%, mean spread increases again from 2009 and reaches 6.2% in 2011. This increase in spreads since 2009 was largely reported in financial

[5] See Torstila (2001) for the calculation under the sponsor system. Specifically, sponsor fees are incurred under the recommendation system after the introduction of IPO sponsors in 2004. The fees are paid to sponsors, in most cases also bookrunners/lead underwriters, for their consultation services conditional on completing and submitting the application documents and preliminary prospectus to CSRC. This amount of fee is paid to sponsors anyway regardless of the final decision made by CSRC.

[6] For the 21 spuriously high IPO gross spreads exceeding 10%, we have double checked the data using the prospectuses of issuing firms.

market news and the main reason argued by the bankers was the disappearing large IPOs. There is not much variation in the cost of each project, which is one of the reasons why many large investment banks were initially reluctant to do small projects. For big projects, the gross spreads are naturally low (The Economic Observer, July 20th 2012). However, if the size of IPOs is the only reason driving the changes in gross spreads, Figure 2 should show less variation in the spreads with same proceeds. Moreover, Table II does not show a clear decreasing trend in mean proceeds.

Third, although there exists considerable variation in gross spreads for the same proceeds level, Figure 1 still shows the palpable economies of scale over the range of proceeds. Following the literature, IPO proceeds are expressed using 2012 U.S. dollars. The highest spreads are all charged to issuers with proceeds less than $90 million ($68 million, measured in 1997 U.S. dollar), equivalent to small to medium sized IPOs in the U.S..[7] And for the largest ones with proceeds more than $500 million, the spreads never exceed 4%. Table II and Figure 2 together suggest that there may not only exist economies of scale in gross spreads, but also variations after controlling the proceeds. A possible reason could be that the adoption of the more sophisticated bookbuilding pricing method since 2006 drives the gross spreads up. In the later part of regression analysis, we try to address the economies of scale, the changing pricing methods and regulation to see if they can explain any systematic variations in gross spreads.

As previous studies, we use the IPO first-day return as the proxy for indirect cost of going public. Table II suggests that the level of mean first-day return is high in China (see, e.g. Loughran, Ritter, and Rydqvist, 1994) and their updated online data[8]). The high first-day

[7] Chen & Ritter (2000) categorized the IPOs with proceeds less than $80 million (expressed in 1997 U.S. dollars) as small to median sized IPOs.
[8] Data available at *http://bear.warrington.ufl.edu/ritter/pbritter.htm*

return reflects the over-demand for IPOs at the offer price and has stimulated speculation in the primary market. The Chinese IPO market was always referred to as riskless by most investors. However, in Our sample, the first-day return is not always positive for the recent period. There are 104 out of 1171 IPOs with negative first-day returns. The change in first-day returns over time shows the opposite trend compared to gross spreads. Table II shows a decrease in mean first-day returns until 2005 and another one from 2007 to 2011. As the factors stated to impact IPO first-day returns are quite a few, we try to address the ex ante risk factors, speculation factors, underwriters' certification effect and regulatory changes. Also, after controlling for those factors it is interesting to see whether there exits substitution between gross spreads and underpricing.

The SOE issuers in China are usually large in size, and are the major players in their industries enjoying various privileges given by the government. And the literature shows the privatization IPOs have lower gross spreads and higher underpricing. In Our sample, most IPO firms before the year 2005 are large state owned enterprises (SOEs) listed in Shanghai Stock Exchange (SSE). While, Panel A of Table II shows that after the year 2006 the proportion of SOEs kept decreasing from 46.2% in 2006 to 5.7% in 2011. The existence of potential differences of SOEs as well as the change in distribution between SOEs and non-SOEs gives good reasons to differentiate SOEs from non-SOEs. The definition of SOEs, however, is not clearly stated in the documents issued by CSRC. Huyghebaert and Quan (2009) define an SOE issuer if shares owned directly by the state and other state-owned legal persons exceed 20% before IPO. And China Security Index (CSI) State-owned Enterprises Composite Index includes all the listed State-owned Enterprises. We obtained the intersection of the two sets and further added the firms with a state-ownership greater than 50% before IPO. We further add the firms with state ownership greater than any other ownership and

manually check the prospectuses to see whether the stated actual controlling shareholder is the State-owned Assets Supervision and Administration Commission (SASAC) or a state owned enterprise. The final subsample of SOEs ends up with 254 firms. And non-SOE subsample includes 917 firms.

Panel B of Table II describes the main variables of 254 SOEs and Panel C describes the 917 non-SOEs. The number of SOEs relative to non-SOEs is decreasing. As in the early years of the stock market establishment in mainland China, the Chinese government stressed that the function of stock exchanges was to raise capital for SOEs to reduce government subsidies; however, as the progress in restructuring SOEs, there were fewer SOEs need to get listed. The gross spread is generally larger for non-SOEs throughout all years and with a total sample mean of 3.2% for SOEs, 5.2% for non SOEs; however, the mean gross proceeds of SOEs are greater than the non-SOEs indicating a possible economies of scale effect. Although the initial return for all SOEs is greater than all the non SOEs, it is not consistent throughout all years. Figure 3 and Figure 4 illustrate the mean gross spreads and initial return for SOE and non SOEs throughout the sample period.

The total revenue, again, shows that SOEs are larger firms. Specifically, since 2006, the relative number of SOE issuers is decreasing; but their size is dramatically increased. P/E ratio does not show obvious differences between the two groups nor a clear time trend.

In order to investigate the change in issuing firm and IPO prices, we further divide the sample period into two subperiods according to the regulatory background: 2001-2005 and 2006-2011. Although the price inquiry system was established as early as in Dec 2004, the bookbuilding IPO process was not introduced until 2006. Before 2006, almost all IPOs were priced using a fix price or fix P/E ratio method; and after that, all IPOs were required to go through a bookbuilding process. Moreover, the Split-share Reform of SOEs was

accomplished in 2006. Table III describes the key variables according to the two periods. The mean gross spread of non-SOEs increases for the 2006-2011 period, but not obvious for SOEs. Initial returns decrease for both SOEs and non-SOEs. To conclude the differences between SOEs and non-SOEs, SOE issuers are larger in IPO proceeds and firm size. The number of SOE issuers decreased since 2006 compared to non SOE issuers. The gross spreads charged to SOEs are lower; while, the first-day return does not show systematic difference between the two.

4. Empirical Analysis

4.1 Univariate Analysis

In order to give an overall picture regarding the difference between SOEs and non SOEs as well as the general trend between the two periods, we conduct the univariate analysis regarding privatization and time periods. The last line in Panel A of Table IV shows the results of t-test for difference in mean gross spreads between SOEs and non SOEs during each period. The result shows that the mean gross spread for SOEs is significantly lower than non-SOEs during both periods. For the first period (2001-2005), the difference is 0.908% and the wedge increases to 1.921% for the second period. Panel B shows the difference in mean initial returns between the two groups. During 2001-2005, mean first-day return for SOEs is 33.55% higher than non-SOEs; while during 2006-2011, 34.80% higher than non-SOEs. The difference in mean initial returns between SOEs and non-SOEs does not vary a lot throughout the two periods.

Similarly, the last column in Table IV shows the results of t-tests on whether the mean gross spreads and mean initial returns for SOEs and non-SOEs are significantly different between the two periods. In panel A, the mean gross spread for SOEs increases by 0.425%

during the second period; while the mean gross spread for non-SOEs increases more significantly by 1.438% during the second period. Panel B shows that for the whole sample, the mean initial return significantly drops by 27.74% during the second period with both SOEs and non-SOEs enjoy a decrease in mean initial returns, although, not significant.

Results in Table IV indicate that SOEs are basically charged with lower gross spreads; but have higher first-day returns. And gross spreads increase from 2001-2005 to the recent period while first-day returns decrease from 2001-2005 to the recent period. However, as stated in Table II, SOEs are generally larger than non-SOEs with more proceeds. So, the difference in gross spreads and first-day returns may just be the effect of economies of scale. Also, as the proportion of SOEs decreased in the second period, the captured differences between the two periods might just be the result of the increased number of non-SOEs in the sample. So, the more rigorous multivariate regressions are needed to further explain the observed variations in gross spreads and initial returns.

4.2 Regressions of IPO Gross Spreads

Having conducted the univariate analysis, multivariate regressions are used to find out whether there are any systematic variations in gross spreads that can be explained by issue characteristics, syndicate structure and regulation impacts. The baseline OLS regression includes IPO proceeds, privatization, the dummy variable for GEM, year trend and period, as well as syndicates, including identity of senior managers, lead managers' reputation, and number of lead managers:

$$spread_{i,k} = \beta_0 + \beta_1 lnProceeds_i + \beta_2 ForeignBulgeBracket_i + \beta_3 TopLeadManager_i$$
$$+ \beta_4 NumberofBookrunners_i + \beta_5 Privatization_i + \beta_6 GEM_i + \beta_7 Year_i$$

$$+\beta_8 Period2006\_2011_i+(\sum_k \delta_k)_i+\varepsilon_i \quad (1)$$

Specifically, ln(Proceeds) controls for economies of scale in the gross spread variation. Privatization dummy captures the potential difference in gross spreads between SOE and non-SOE issuers and GEM captures the different listing requirements and composition of issuing firms in SZE-GEM. The *Period2006_2011* dummy captures potential change in conditional means between the two periods. Industry fixed effect, δ_k, is included to control for the potential difference among industries with industry categories defined by CSRC and obtained from GTA database.

To describe the underwriting syndicate structure, Dunbar (1999) state that prestigious banks face greater reputation risk in underwriting business. Torstila (2003) and Ljungqvist et. al (2003) stress that U.S. underwriters are charging more spreads for the IPOs priced through bookbuilding process outside U.S.. So in spite of the fact that more reputable banks are more likely to underwrite larger, less risky IPOs, we want to see the impact of underwriter reputation and foreign underwriters on IPO gross spreads.

To address the reputation of underwriters, the dummy variable, *Top lead manager*, indicates whether the lead manager or the bookrunner includes a prestigious bank. The ranking of underwriters is available from the website of Securities Association of China[9]. We use the total proceed ranking for the underwriter. As the underwriter ranking in China is only available since 2007. We calculate the equally weighted mean scores for each bank; then rank the banks according to mean scores and extend the ranking to the years before 2007. Furthermore, although the foreign-shared security companies are seldom ranked as top 10 underwriters, some of them have high reputation in international markets. So, we use the

[9]The data is obtained from http://www.sac.net.cn/hysj/zqgsyjpm/

Carter-Manaster ranking obtained from Jay Ritter's IPO data websiteand define a top underwriter with an average ranking above 8[10].

In order to test whether the identity of underwriter would influence the IPO gross spreads and underpricing, following Ljungqvist, Jenkinson, and Wilhelm (2003), and Torstila (2003), we use the dummy of *Foreign bulge-bracket* to indicate the presence of at least one top foreign-shared security company at the senior position in the syndicate. Follow Ljungqvist et. al (2003) and Corwin and Schultz (2005), bookrunners and (co-)lead managers are defined as the senior positions in underwriting syndicate. Note that the proportion of IPOs underwriting syndicate including a foreign bulge-bracket bank is much lower in China than in European countries, or other open capital markets. The reason lies in the close of China's capital market before 2002. And even after the allowing the entry of foreign institutions into China's capital markets, considerable barriers still exists.

Besides, the number of lead is also claimed as a factor that could influence the level of gross spreads and underpricing (see, e.g., Corwin and Schultz, 2005; Hu and Ritter, 2007, and Ljunqvist et. al, 2003). Specifically, multiple bookrunners in the syndicates results in a relatively high file price range and high offer price, lower underpricing and more analyst coverage. Also, multiple bookrunners indicates more competition between underwriters. Thus, the gross spreads are not increased. However, Corwin and Schultz (2005) state that including multiple bookrunners is not costless, especially for small issuers. In Our sample, before 2005, no IPOs have more than one lead manager; however after 2006, multiple bookrunner appeared and mostly for SOEs (unreported data). Also, Table II shows that the proportion of large SOE issuers decreased since 2006. This situation is somewhat similar as the U.S. condition state by Hu and Ritter (2007). The reduced number of large SOE issuers might

[10]Data is obtained from *http://bear.warrington.ufl.edu/ritter/ipodata.htm*

induce more competition among underwriters. Also, bookbuilding, as a more complex pricing method, is largely used since 2006, which might require more experts in the underwriting syndicate. So, we include the variable, Number of lead managers to see whether it has any impact on gross spreads or first-day return of IPOs in China.

The variable, *Year*, captures the time trend in gross spreads' pattern. It equals 0 for 2001, 1 for 2002, and etc. However, this specification assumes no change in and year trend of gross spreads between the two periods separated by the year 2006. In fact, as indicated in Section 2, the change in issuing system, pricing method, as well as the SOE Split-share Reform happened during 2005-2006 might have brought substantial changes to Chinese IPO market. As a result, the year trend could probably be different for the two periods. Therefore, we make a different specification of the year trend as follow:

$$Year1 = Year$$
$$Year2 = \begin{cases} 0 & if\ Year < 2006 \\ Year - 5 & if\ Year \geq 2006 \end{cases} \quad (2)$$

By replacing the *Year* variable in equation (1) with *Year1* and *Year2* here, the trend effect is allowed to change between the two periods. The year trend in either specification, combined with the period dummy, capture the potential impact of institutional reforms on gross spreads. Specifically, the coefficient on *Period2006-2011* captures the change in conditional mean of gross spread from 2005 to 2006, the coefficient on *Year1* captures the slope of year trend before 2006, and the coefficient on *Year2* captures the change in slope of year trend after 2006.

Finally, as the bookbuilding method is used for almost all the IPOs after 2006 and almost

none of the IPOs before 2006, the bookbuilding dummy is redundant if the period dummy for 2006-2011 is already added. So, we do not include variables indicating different pricing methods.

The first two columns in Table V show the results for the whole sample with column (1) using the baseline model and column (2) using *Year1* and *Year2* instead of *Year*, defined in (2). All of the coefficients are based on OLS estimators and t-statistics are based on heteroskedasticity-robust standard errors.

The result shows that the economies of scale effect is significant for Chinese IPOs and the economic significance is larger than U.S. IPOs or European IPOs.[11] Specifically, an increase of ￥18 million in IPO proceeds will reduce the gross spread by approximately 1.5%. All of the variables with respect to underwriting syndicate are significant. Specifically, including a foreign-shared security firm that is affiliated with a bulge-bracket foreign bank at the senior position of syndicate will increase the gross spread by 1%, using a top underwriter as the lead manager will increase the gross spread by 0.37%, and adding one more lead manager will increase the gross spread by about 0.9% after 2006. This is not consistent with Torstila (2001) and Liu and Ritter (2007), in which they obtain the evidence from U.S. and European countries including that multiple bookrunners in the syndicate will not significantly increase the gross spreads as a result of competition. However, in a later discussion, after splitting the data into SOEs and non-SOEs, the consistence shows up in the SOE subsample.

Also, the positive and significant coefficient on GEM shows that the firms listed in this market are charged 0.5% more in gross spreads. This could be caused by the different listing requirements between SZE-GEM and main boards. The listing requirements are generally lower for SZE-GEM, as the listing firms are smaller, younger, riskier, and having high growth

[11] See Abrahamson, Jenkinson and Jones (2011) for the economies of scale of U.S. and European IPOs.

opportunities. Also, the Interim Measures for the Administration of the GEM established a requirement for investors in GEM[12]. Specifically, the investors should have at least two years record of trading in the stock market. For those with less than two years record, a strict examine is conducted to make sure that the investor's risk tolerance matches the risk in GEM. Such mandate results in a narrowed investor base for the IPOs listed in GEM and underwriters have to exert more effort in selling those IPOs. Moreover, as the issuers in GEM are younger, riskier and smaller non-SOEs, the possibility that the issuance will be rejected by CSRC is higher than the larger and older SOE issuers. So, the higher spreads could indicate an extra compensation for the stricter requirements and the higher rejection risk in GEM.

The coefficient on *Year* shows that there is an increasing trend in gross spreads throughout the sample period. This could stem from the more and more delicate pricing processes adopted in pricing IPOs. As previously stated, back in 1990s, the quantity and price of IPOs were both pre-determined and has few things to do with market supply and demand. After some intentions to adopt more market-oriented pricing methods in late 1990s and early 2000s, the bookbuilding process was widely used under price inquiry system. Thus, the increasing trend in gross spreads could indicate the growing sophistication in IPO underwriting business.

Instead of using a Privatization dummy, we further split the sample into two subsamples to see the difference between SOEs and non SOEs. Column (3) (4) show the results of the same regressions using SOE subsample and column (5) (6) show the results for non-SOE subsample.

The increasing trends in gross spread of SOEs and non-SOEs during the first period are almost the same, 0.439% each year. However, for the second period, a 0.283% drop in the

[12] CSRC 2009 No. 61, enacted since May 1st 2009

increasing speed among SOEs suggests a weaker increasing trend for SOEs; while, the increasing speed for non-SOEs is faster. The decrease in increasing trend for SOEs could be explained by increased competition among underwriters. In Panel B, Table II, the number of SOEs less and the average size is larger in the second period. And as underwriters stated that they compete for large projects; the competition for large SOEs after 2006 could be greater. Also, in China, multiple bookrunners showed up only after 2006 and mainly (about 90%) for SOEs (unreported data).The situation of number of SOEs, multiple bookrunners and gross spreads is consistent with the results documented by Liu and Ritter (2007), where they found that the number of IPOs decreases, while multiple bookrunners show up and the competition between underwriters makes the gross spreads remain at seven percent[13]. Thus, even the more delicate pricing method demands higher gross spreads, the gradually intensified competition for large SOEs among underwriters weakened the bargaining power of underwriters on SOE deals.

Besides, the variables regarding the underwriting syndicate are also different between the two groups. The Foreign bulge-bracket dummy is only significant for SOEs, Top lead manager/bookrunners is only significant for non-SOEs and Number of lead manager/bookrunner is just significant for non-SOEs. The difference in Number of lead manager/bookrunner, again, supports the statement of increased competition for SOE deals. And it is consistent with Corwin and Schultz (2005) that larger syndicate size will increase the gross spread for small IPOs. And the evidence from SOE sub-sample is consistent with Liu and Ritter (2007) that the increased competition for SOE deals made the spreads increase less compared to non-SOEs.

To look at the difference between the two periods more carefully, we further split the

[13] They state that, as the decrease in number of IPOs each year, multiple bookrunners show up.

sample into two subsamples according to the two periods. By doing so, we can also check whether the obtained differences between SOEs and non-SOEs are consistent throughout different periods. The results are shown in Table VI, with first three columns for the first period and last three for the second period. The result shows that the higher spreads charged by foreign bulge-bracket banks are only significant during the non-bookbuilding period, 2001-2005, when IPOs were priced using fixed price or fixed P/E ratio. This evidence is not consistent with the evidence obtained in Ljungvist et. al (2003), which shows the fact that U.S. underwriters are charging higher spreads as they are more experienced in conducting bookbuilding. However, the special situation in China's market could possibly explain the difference. First, before 2006, the quota system has just ended; domestic underwriters at that time did not have enough experience in pricing IPOs. However, foreign banks have a well established international presence and reputation in pricing new issues and conducting underwriting businesses. Also, foreign shared underwriters were rare in before 2006. Thus, those reputable foreign banks have a stronger bargaining power and can charge a hither spread. However, for the years after 2006, domestic underwriters are gaining more experiences in underwriting business and established their reputation in the market, such as CITIC, Haitong Securities, Guotai Junan Securities, Guoxin Securities etc, more foreign banks enter into China's stock market, and the number of large issuers decreases. The specialty and Superiority of those foreign banks become less attractive; thus the effect on *Foreign bulge-bracket* dummy is weakened.

Unlike the foreign bulge-bracket banks, the top underwriters appear in both groups, however just significant for non-SOEs during the second period. This difference between SOEs and non-SOEs could also be that underwriters, especially large, reputable underwriters compete for large SOE issuers. As the decreased number of SOEs for the second period, the

competition intensified for SOEs resulting in a relatively lower level of spread. The number of lead manager/bookrunner variable is significant for both groups during the second period; however, the increase in gross spread is much lower for SOEs. This is consistent with the explanations that larger size of syndicate is not costless and, for SOEs, the more intensive competition between underwriters lowered the gross spreads.

Moreover, with the sub-period analysis, a clearer evidence of the difference in year trend of spreads for SOEs and non-SOEs is obtained. To illustrate the result, two graphs separately showing the time trend in SOEs and non-SOEs are drawn in Figure 5. The solid line stands for SOEs and the dashed line stands for non-SOEs. The change in slopes for SOEs and non-SOEs is consistent with the result in Table V and could be explained by more delicate pricing process and increased competition for SOEs during the second period. However, notice that the conditional mean of spread for SOEs and non-SOEs decreases after 2006. Intuitively, the bookbuilding pricing method should result in a jump for the conditional mean of gross spread after 2006. However, the significant drop in conditional mean of gross spread needs further explanation. As stated in Section 2, after the abolishment of quota system, the channel system was enacted and functioning during 2001-2005. Although the fixed quota on number of IPOs disappeared, there was still an explicit limitation on issuing firms, the fixed number of channels hold by underwriters. In 2006, after the abolishment of the channels, the restriction on supply of underwriting service was released. And such abolishment of quota should increase the number of IPOs and decrease the conditional mean gross spread. Notice that the drop for non-SOEs is greater than SOEs. The reason could be explained as, under the channel system, for each channel, the underwriter can only recommend one issuer at a time and only after the issuer got listed or rejected by the CSRC, the underwriter can recommend another issuer. Such “one firm at a time” channels severely hampered the efficiency in underwriting

process and underwriters would avoid the firms that were more likely to be held for longer time of investigation by the CSRC. SOEs, being larger, older and usually supported by the government were less likely to be held for extra investigation. So, for the channel system, the limitation on issuing firms was much more pronounced for non-SOEs. Hence, the abolishment of channels released the restriction on supply of underwriting service more for non-SOEs.

4.3 Regressions of IPO Initial Return

As shown in Table IV, univariate analysis, SOEs are generally having lower gross spreads but higher initial returns than non-SOEs. And as gross spread increases between the two periods, IPO initial return decreases. It seems suggesting that there could be some relationship between the direct and indirect cost of IPO. So, we estimate the following multivariate regression model, where the gross spread is included to see whether it will impact the initial return. All of the key variables in regression (1) are included and other important variables shown to explain IPO initial returns are added:

$$\begin{aligned} return_{i,k} = {} & \beta_0 + \beta_1 lnProceeds_i + \beta_2 spread_i + \beta_3 ForeignBulgeBracket_i + \beta_4 TopLeadManager_i \\ & + \beta_5 NumberofBookrunners_i + \beta_6 Privatization_i + \beta_7 ln(OverSubscriptionMultiple)_i \\ & + \beta_8 PriceRevision_i + \beta_9 Volume + \beta_{10} MarketReturn + \beta_{11} GEM_i + \beta_{12} Year_i \\ & + \beta_{13} Period2006_{2011_i} + FirmCharacteristics_i + (\sum_k \delta_k)_i + \varepsilon_i \end{aligned} \quad (3)$$

Firm Characteristics are the variables of *Revenue*, *EPS*, *P/E ratio*, and *Age*. As a proxy for firm size, the amount of total revenue before IPO is expressed in 2012 U.S. dollars. *P/E ratio* is calculated as the offer price divided by EPS before IPO. The regulation issued by CSRC

states that given the P/E ratio exceeding the industry average by 25%, it needs to be disclosed as a risk factor in the prospectus. In fact, if the P/E ratio exceeds 25% of industry average, there are more restrictions on the issuing firms. So, few issuers set the offer prices at a high level like that (SSE Research Report, 2012). However, GTA database does not provide the industry average P/E ratios for IPO firms. Other sources, like CNINF, also just provide the industry average P/E ratio in 2012. So, we cannot address this issue. *Age* and *EPS* of the issuing firms before IPO are proxies of uncertainty of the firms' value as shown in Ritter (1984), Beatty and Ritter (1986), Loughran and Ritter (2004), as well as Chambers and Dimson (2009). Following the literature, we calculate the age of issuing firms as ln(1+Age). *EPS* is calculated using the earnings before IPO divided by the total number of shares before IPO and switch to U.S. dollars using the exchange rate on the reporting day of the earning used.

I further include the *Over subscription multiple*, *Price revision*, *Volume* and *Market Return* to control for other documented factors having impact on IPO initial returns. For *Over subscription multiple*, Derrien (2005) and Cornelli et al. (2006) both obtain the positive relation between individual over subscription multiple and first day return for French stock market and European markets. Gao (2010) obtains the same result using China IPO data from 2006-2008. They claim that the individual over subscription multiple indicates the demand from individual investors and is a proxy for irrational investor sentiment.

Price Revision is calculated as the percentage change from the average of filing price to the first-day closing price. It is a key variable explaining IPO underpricing under bookbuilding method in the U.S. markets (see, e.g., Hanley, 1993; Lee, Taylor, and Walter, 1999; and Cornelli and Goldreich, 2001). However, the situation in China is different. First, as stated in section 2, bookbuilding process in China is different from the U.S.. First, the

underwriters do not have the discretion on share allocation. Thus, underwriters cannot exert information from investors by underpricing. Second, the price range disclosed in prospectus of IPOs is different from the one addressed in U.S. markets. In China, the price range is determined during bookbuilding process and released, usually, one day before the on-line road show. So the disclosed price, already reflecting the market demands, is not the "initial" price range address in the literature.

Volume is measured as the percentage of total shares outstanding as a proxy for investor sentiment and speculation. Ofek and Richardson (2003), Cornelli et al. (2006) and Gao (2010) all find that the aftermarket total volume is positively related to individual investor sentiment. Higher sentiment leads to higher first-day return. *Market Return* is calculated as the return on equally weighted market portfolio one month before the first trading day of each IPO. Ritter (2002) documents that IPOs in high market return periods have higher underpricing and use prospect theory to explain it. As stated by Miller (1977), the markets return one month before IPO represents the investor sentiment and could cause overpricing of IPOs aftermarket. In spite of the difference between the two explanations, the documented relationship between market return one month before IPO and IPO initial return is positive.

Specifically, we estimate the OLS regression (3), as well as use the other specification of year shown in (2). Table VII presents the results. Columns (1) to (3) present the result of the baseline model for the whole sample, SOE subsample and non-SOE subsample. Columns (4) to (6) present the result using the specification of year trend defined in equation (2), while, columns (7) to (9) use year dummies to capture variation among years.

Gao (2011) states that *ln(Revenue)*, *EPS Age* and *Price revision* are included to capture the pre-market deliberate underpricing. And *ln(Over Subscription Multiple)*, *Volume* , and *Market return* are included to capture the aftermarket overpricing or, equivalent, speculation

(see, e.g., Gao, 2011). As shown in Table VII, among the variables with regard to the underpricing proportion of the first-day return, price revision is significant for both SOEs and non-SOEs throughout all specifications in Table VII, but the coefficient on it is of the opposite sign as the literature (See Hanley (1993), Loughran and Ritter (2004), Chambers and Dimson (2009)). We have already stated the difference of China's bookbuilding process compared to U.S. bookbuilding. The negative sign on Price revision is suggesting that the information obtained during bookbuilding process is used to adjust the offer price towards its market price. Besides, age is only significant for non-SOEs and ln(Revenue) is only significant for SOEs.

On the other hand, the variables for aftermarket overpricing (speculation) are all significant and of the correct sign as suggested by behavioral arguments of IPO aftermarket overpricing. Specifically, greater over subscription multiple of individual suggests higher investor sentiment which leads to higher first-day return (see, e.g., Derrien, 2005 and Cornelli et al., 2006). Also, higher market return for the previous one month and larger volume on first-trading day also suggests higher investor sentiment. So, it seems that the result shows a stronger significance for behavioral arguments in explaining IPO initial returns, which is consistent with Gao (2011).

The privatization dummy shows that SOEs have higher initial returns, which is consistent with the univariate analysis. And IPOs listed in GEM have lower first-day returns. And for the variables indicating the syndicate structure, only *Number of lead manager* is significant, for which, having more lead managers will lead to more first-day return.

Moreover, the time trend and change between periods show the opposite direction compared to gross spreads. Initial return is decreasing throughout the sample period. The decreasing trend in first-day return is expectable. As the first-day returns for the early years of

China's stock market were very high due to the quota system and the lack of efficient channels for investment in the capital market. So, the demand of IPOs was very high and speculative. With the development of the capital market, ways of investment gradually increased, and the over-demand for IPOs has been reduced. Thus, the change in supply-demand equation of IPO shares leads to the decreasing IPO first-day return.

However, the results do not show obvious relation between gross spread and first-day return. It is reasonable, though. As the result indicates that the IPO initial return in China is largely explained by the speculation behavior, the initial return is not a good proxy for pre-market underpricing any more. So the potential substitution between direct cost and indirect cost cannot be analyzed using IPO initial returns.

To further check whether there are any changes in the pattern between different periods, we run the sub-period regressions according to the two periods and report the result in Table VIII. The result shows that the evidence obtained from whole sample is mostly driven by the second period. Moreover, we draw the picture to depict the year trend for SOEs and non SOEs in Figure 6. The slope for the decrease in initial returns is greater for non-SOEs during the first period, but not quite different during the second period. However, there is a huge increase in conditional mean of initial returns in 2006, especially for non-SOEs. A possible explanation could lie in the IPO suspension caused by the split share reform during 2005-2006; however, without more information or data, we could not draw any remarks about this evidence.

5. Conclusion

By examining a sample of Chinese IPOs conducted during 2001-2011, we obtain the first evidence from Chinese IPOs on the direct issue cost, the gross spreads. Consistent with

previous studies of international IPOs outside the U.S. market, Our results show that IPO gross spreads in China do not exhibit clustering. Instead, there are considerable variations in the spreads, which differ notably between the two distinct time periods, 2001-2005 and 2006-2011, and between SOEs and non-SOEs. In addition to the pattern of over-time increase of the spreads, important factors that contribute to the spreads include issue proceeds, number of bookrunners, and bookrunner reputation.

Two findings are particularly worth noting. One is that there is a significant difference in the year-to-year change of the spreads between SOE and non-SOE new issues during the years 2006-2011 when the bookbuilding underwriting method was used. The average increase is 0.73 percentage points each year for non-SOE issuers, which is contrasted to 0.16 percentage points for SOE issuers. This finding is consistent with the pattern of increasingly more non-SOE IPOs; in this period, while total IPOs increased dramatically over time, the increase is predominately driven by non-SOEs. Hence, the increased demand from non-SOEs for underwriting services in this period might have well driven underwriting fees up. The other finding is that there is a strong positive association between the spread and the number of bookrunners in the IPO; for one more bookrunner, the average spread increases by one percentage point. This finding appears to suggest a link between underwriting fees and the complexity of underwriting. While these findings are consistent with a demand-supply mechanism in the determination of underwriting fees, they show no collusive behaviors on the part of underwriters.

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Table I. By-Year Distribution of IPOs

This table shows total IPOs each year listed as A-shares on Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZE) during the years 1991-2011, and IPOs each year that have gross spreads data.

Year	Number of IPOs	Number of IPOs with Gross Spread Data
1991	4	0
1992	27	0
1993	118	0
1994	101	3
1996	176	4
1997	198	5
1998	102	1
1999	96	3
2000	133	4
2001	75	21
2002	71	60
2003	67	35
2004	100	53
2005	15	13
2006	65	65
2007	123	123
2008	76	76
2009	99	99
2010	347	347
2011	282	279
Total	2,126	1,171

Table II. By-Year Summery Statistics for Selected Variables

The sample contains 1,171 Chinese IPOs conducted during the years 2001-2011. We exclude closed-end funds, REITs, and unit offerings from the sample. Gross spreads is the total underwriting fees and sponsorship expenses as a percentage of the gross proceeds. IPO initial return is calculated as the percentage difference from the final offer price and the first trading day closing price. Gross proceeds excluding overallotment options and total revenue one year before the IPO are reported in 2011 U.S. dollars. P/E ratio is the offer price divided by earnings per share one year before the offering. Panel A, B and C report the statistics for all IPOs, state-owned-enterprise (SOE) IPOs, and non-SOE IPOs, respectively.

		Gross Spreads (%)			Initial Returns (%)			Gross Proceeds ($ mil)	Total Revenue ($ mil)	P/E Ratio
Year	Number of IPOs	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Mean	Mean
Panel A: All IPOs										
2001	21	2.3	2.0	0.8	126.0	111.6	77.4	190.5	2,467.6	33.2
2002	60	2.7	3.0	0.5	138.7	118.2	85.9	113.1	140.1	27.7
2003	35	2.9	3.0	0.5	62.6	49.5	36.9	86.0	141.3	37.6
2004	53	4.2	4.1	1.3	65.3	50.0	55.9	47.3	109.9	19.9
2005	13	5.3	4.2	2.7	35.7	43.2	23.5	35.7	87.8	13.9
2006	65	4.3	3.9	2.0	84.8	75.5	59.3	267.8	969.6	16.7
2007	123	4.3	4.1	1.8	191.1	170.6	111.2	518.1	1,120.1	23.3
2008	76	4.4	4.1	1.7	115.8	84.1	89.8	191.2	415.4	20.4
2009	99	4.2	4.2	1.5	74.1	75.8	42.7	289.8	712.6	41.4
2010	347	4.8	4.6	1.7	41.4	31.4	41.5	210.7	248.3	44.6
2011	279	6.2	6.0	2.2	21.1	14.4	30.5	150.3	299.4	36.2
All years	1,171	4.7	4.4	2.0	70.4	45.6	79.7	218.8	465.2	34.2
Panel B: SOE IPOs										
2001	17	2.4	2.1	0.8	129.9	111.6	85.0	202.5	3031.2	34.6
2002	45	2.6	2.8	0.5	137.8	121.8	84.5	135.1	176.2	26.5
2003	22	2.7	3.0	0.5	68.4	62.3	39.6	105.1	204.2	28.7
2004	17	4.2	3.3	1.4	74.4	85.5	44.9	65.1	179.7	20.6
2005	5	4.7	3.4	3.3	51.6	54.8	24.7	37.9	122.9	13.0
2006	28	3.4	3.1	1.6	67.7	64.6	60.6	564.6	2,134.9	14.9
2007	43	3.3	3.3	1.5	174.5	147.6	114.6	1,218.2	2,864.4	26.3
2008	18	3.8	3.6	1.9	95.8	71.6	73.2	606.7	1,549.9	21.5
2009	19	3.3	3.0	1.2	69.0	56.2	49.1	1,077.8	3,338.4	37.4
2010	28	3.1	3.1	1.4	48.1	30.1	51.8	954.3	1,877.2	32.7
2011	12	3.5	3.4	1.7	32.1	28.9	27.5	615.1	1,710.9	32.0
All years	254	3.2	3.0	1.4	100.8	81.0	86.8	578.0	1,633.8	26.7
Panel C: Non-SOE IPOs										
2001	4	2.0	1.8	0.6	109.0	114.5	29.5	139.5	72.1	27.3
2002	15	3.1	3.0	0.4	141.4	111.0	93.1	47.1	31.8	31.3

2003	13	3.1	3.0	0.6	52.8	45.8	31.0	53.6	34.9	52.5
2004	36	4.2	4.1	1.3	61.1	45.0	60.5	38.9	77.0	19.6
2005	8	5.7	5.5	2.4	25.8	19.0	17.5	34.4	65.9	14.4
2006	37	5.0	4.8	2.0	97.8	87.1	55.6	43.1	87.7	18.1
2007	80	4.8	4.6	1.8	200.0	177.2	109.0	141.9	182.5	21.6
2008	58	4.6	4.5	1.6	122.0	87.6	94.1	62.2	63.3	20.1
2009	80	4.4	4.3	1.5	75.4	76.0	41.3	102.7	88.9	42.3
2010	319	4.9	4.8	1.7	40.8	31.4	40.6	145.4	105.3	45.7
2011	267	6.3	6.0	2.2	20.6	13.9	30.6	129.4	236.0	36.3
All years	917	5.2	4.9	2.0	62.0	37.9	75.6	119.3	141.5	36.3

Table III. Summary Statistics for Sub-Periods, SOEs, and non SOEs

This table presents summary statistics for selected variables for two sub-periods, 2001-2005 and 2006-2011, separating SEO and non-SOEs offerings. Gross spread is the total underwriting fees and sponsorship expenses as a percentage of the gross proceeds. The initial return is calculated as the percentage return from the offer price to the first trading day closing price. Gross proceeds excluding overallotment options and total revenue one year before the IPO are reported in 2011 U.S. dollars. P/E ratio is the offer price divided by earnings per share one year before the offering. Panel A, B and C report the statistics for all IPOs, SOE IPOs, and non-SOE IPOs, respectively.

		Gross Spreads (%)			Initial Returns (%)			Gross Proceeds ($ mil)	Total Revenue ($ mil)	P/E Ratio
Period	Number of IPOs	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Mean	Mean
Panel A: All IPOs										
2001-2005	182	3.3	3.0	1.4	93.9	82.0	75.6	92.1	396.4	27.0
2006-2011	989	5.0	4.8	2.0	66.1	40.6	79.8	242.1	477.9	35.6
All years	1,171	4.7	4.4	2.0	70.4	45.6	79.7	218.8	465.2	34.2
Panel B: SOE IPOs										
2001-2005	106	2.9	3.0	1.2	107.9	100.3	76.5	123.9	637.9	26.7
2006-2011	148	3.4	3.3	1.5	95.7	71.1	93.3	903.3	2,347.1	26.7
All years	254	3.2	3.0	1.4	100.8	81.0	86.8	578.0	1,633.8	26.7
Panel B: Non-SOE IPOs										
2001-2005	76	3.8	3.2	1.5	74.3	51.9	70.2	47.9	59.5	27.4
2006-2011	841	5.3	5.0	2.0	60.9	36.7	76.0	125.7	148.9	37.1
All Years	917	5.2	4.9	2.0	62.0	37.9	75.6	119.3	141.5	36.3

Table IV. Differences in Gross Spreads and Initial Returns

This table compares IPO gross spreads and initial returns between the two sub-periods, 2001-2005 and 2006-2011, and between SOEs and non-SOEs. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	2001-2005	2006-2011	Whole Sample Period	Difference in mean
Panel A Gross Spreads				
SOEs: Mean	2.934	3.359	3.182	0.425*
Observations	106	148	287	
Non-SOEs: Mean	3.842	5.280	5.161	1.438***
Observations	76	841	884	
Difference in mean	- 0.908***	-1.921***	-1.979***	
Panel B Initial Return				
SOEs: Mean	107.991	95.723	100.797	-12.16
Observations	106	148	254	
Non-SOEs: Mean	74.333	60.927	62.038	-13.41
Observations	76	841	917	
Difference in mean	33.550**	34.800***	38.760***	

Table V. Determinants of IPO Gross Spreads

This table presents the regressions of IPO gross spreads on issuer and underwriter variables. The gross spread is total underwriting fees and sponsorship as a percentage of the gross proceeds. Foreign bulge-bracket is a dummy variable that equals one if a foreign bulge-bracket bank is included as (co-) lead manager in the underwriting syndicate. Top lead manager is a dummy variable that equals one if a top-ranking underwriter is included as lead manager in the syndicate. Privatization is a dummy variable for state-owned-enterprise (SOE) issuers. GEM is a dummy variable for IPOs listed on the Shenzhen Stock Exchange-Growth Enterprises Market. Year is a standardized year variable, which equals 0 for year 2001, 1 for year 2002, and so on. Year1 and Year2 are year variables for the two sub-periods 2001-2005 and 2006-2011, respectively, as defined in Eq. (2). Period 2006-2011 is a dummy variable for the second sub-period, 2006-2011. Industry dummies based on the China Securities Regulatory Committee (CSRC) industry classification are included. *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Whole Sample		SOEs		Non-SOEs	
	(1)	(2)	(3)	(4)	(5)	(6)
Ln (Proceeds)	-1.413***	-1.436***	-0.883***	-0.818***	-1.780***	-1.814***
	(-20.07)	(-19.89)	(-12.12)	(-13.60)	(-18.85)	(-18.89)
Foreign bulge-bracket	1.009***	1.049***	0.479**	0.374**	0.047	0.043
	(3.55)	(3.59)	(2.41)	(2.14)	(0.08)	(0.07)
Top lead manager	0.366***	0.366***	0.184	0.173	0.419***	0.417***
	(4.19)	(4.21)	(1.54)	(1.43)	(4.04)	(4.02)
Number of lead managers	0.869***	0.910***	0.274	0.184	2.938***	3.025***
	(4.06)	(4.22)	(1.55)	(1.14)	(6.45)	(6.49)
Privatization	-0.114	-0.127				
	(-1.07)	(-1.17)				
GEM	0.587***	0.558***	0.106	0.215	0.398***	0.372***
	(4.57)	(4.28)	(0.35)	(0.65)	(2.96)	(2.75)
Year	0.538***		0.240***		0.693***	
	(14.44)		(3.85)		(15.69)	
Year1		0.406***		0.439***		0.439***
		(4.27)		(2.86)		(3.20)
Year2		0.151		-0.283*		0.278*
		(1.49)		(-1.81)		(1.89)
Period 2006-2011	-1.184***	-0.824**	0.105	-0.458	-1.790***	-1.180***
	(-5.21)	(-2.31)	(0.27)	(-0.74)	(-6.52)	(-2.64)
Constant	7.193***	9.558***	6.500***	8.199***	6.058***	8.943***
	(18.01)	(19.09)	(14.80)	(11.23)	(10.89)	(13.20)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,171	1,171	254	254	917	917
Adjusted R^2	0.5117	0.5122	0.5855	0.5979	0.4373	0.4383

Table VI. Determinants of IPO Gross Spreads: Sub-sample Regressions

This table presents the subsample regressions of IPO gross spreads on issuer and underwriter variables, with the first three columns for the period of 2001-2005 and the other three columns for the period of 2006-2011. The gross spread is total underwriting fees and sponsorship as a percentage of the gross proceeds. Foreign bulge-bracket is a dummy variable that equals one if a foreign bulge-bracket bank is included as (co-) lead manager in the underwriting syndicate. Top lead manager is a dummy variable that equals one if a top-ranking underwriter is included as lead manager in the syndicate. Privatization is a dummy variable for state-owned-enterprise (SOE) issuers. GEM is a dummy variable for IPOs listed on the Shenzhen Stock Exchange-Growth Enterprises Market. Year is a standardized year variable, which equals 0 for year 2001, 1 for year 2002, and so on. Industry dummies based on the China Securities Regulatory Committee (CSRC) industry classification are included. *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Period 2001-2005			Period 2006-2011		
	All	SOEs	non-SOEs	All	SOEs	non-SOEs
	(1)	(2)	(3)	(4)	(5)	(6)
Ln (Proceeds)	-0.727***	-0.544***	-1.214***	-1.468***	-0.864***	-1.848***
	(-6.03)	(-5.27)	(-3.16)	(-15.87)	(-11.54)	(-18.64)
Foreign bulge-bracket	0.824**	0.710**	-0.261	0.887***	0.199	0.154
	(2.44)	(2.07)	(-0.51)	(2.61)	(1.07)	(0.21)
Top lead manager	0.114	-0.037	0.495	0.365***	0.231	0.414***
	(0.54)	(-0.20)	(1.07)	(3.74)	(1.34)	(3.85)
Number of lead managers				1.012***	0.335**	3.065***
				(4.37)	(2.09)	(6.09)
Privatization	-0.209			-0.008		
	(-1.03)			(-0.06)		
GEM				0.535***	0.121	0.359***
				(4.07)	(0.37)	(2.64)
Year	0.546***	0.485***	0.598***	0.575***	0.163***	0.728***
	(5.40)	(2.98)	(4.62)	(13.71)	(2.94)	(15.51)
Constant	4.808***	4.206***	6.045***	8.751***	8.354***	7.925***
	(8.27)	(7.54)	(3.99)	(18.33)	(16.28)	(12.83)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	182	106	76	989	147	841
Adjusted R^2	0.4496	0.4152	0.3749	0.4679	0.6740	0.4175

Table VII. IPO Initial Return and Gross Spreads

This table presents the regressions of IPO initial return on issue and underwriter variables. The dependent variable is IPO initial return, which is the IPO's first-trading day closing price minus the offer price divided by the offer price. The gross spread is total underwriting fees and sponsorship as a percentage of the gross proceeds. Foreign bulge-bracket is a dummy variable that equals one if a foreign bulge-bracket bank is included as (co-) lead manager in the underwriting syndicate. Top lead manager is a dummy variable that equals one if a top-ranking underwriter is included as lead manager in the syndicate. Privatization is a dummy variable for state-owned-enterprise (SOE) issuers. Age is the logarithm value of the issuing firm's age at IPO plus one. Over subscription multiple is the number of shares subscribed by individual investors divided by the actual number of shares allocated to individual investors. Price revision is the change in offer price from the midpoint of the filing price range to the final offer price divided by the mid filing price. Volume is the first-day trading volume divided by the total shares outstanding. Market return is the market return one month before IPO. GEM is a dummy variable for IPOs listed on the Shenzhen Stock Exchange-Growth Enterprises Market. Year is a standardized year variable, which equals 0 for year 2001, 1 for year 2002, and so on. Year1 and Year2 are year variables for the two sub-periods 2001-2005 and 2006-2011, respectively, as defined in Eq. (2). Period 2006-2011 is a dummy variable for the second sub-period, 2006-2011. Industry dummies based on the China Securities Regulatory Committee (CSRC) industry classification are included. *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	SOEs	Non-SOEs	All	SOEs	Non-SOEs	All	SOEs	Non-SOEs
Ln (Proceeds)	-16.964***	-4.840	-19.199***	-18.725***	-7.090	-21.218***	-19.879***	-10.168	-20.799***
	(-4.54)	(-0.57)	(-4.46)	(-4.95)	(-0.82)	(-4.75)	(-5.21)	(-1.22)	(-4.45)
Gross spread	-0.190	-2.344	-0.035	-0.419	-1.144	-0.206	-0.243	-0.346	0.122
	(-0.20)	(-0.52)	(-0.04)	(-0.44)	(-0.25)	(-0.21)	(-0.26)	(-0.08)	(0.12)
Foreign bulge-bracket	9.959	10.391	4.628	13.346	14.416	4.225	10.826	14.243	7.407
	(1.14)	(0.79)	(0.32)	(1.45)	(1.08)	(0.27)	(1.42)	(1.20)	(0.65)
Top lead manager	-0.224	0.777	-0.614	0.158	2.186	-0.614	1.228	2.738	0.470
	(-0.07)	(0.08)	(-0.18)	(0.05)	(0.24)	(-0.18)	(0.40)	(0.30)	(0.15)
Number of lead managers	14.657	23.273**	15.054	17.962*	25.976**	20.215*	7.909	20.663**	-11.771
	(1.51)	(2.40)	(1.57)	(1.80)	(2.58)	(1.94)	(1.14)	(2.44)	(-0.92)
Privatization	19.003***			17.178***			16.449***		
	(3.04)			(2.79)			(2.81)		
Ln (Revenue)	-1.989	-9.685**	0.088	-1.166	-8.525*	0.846	-0.850	-9.714*	1.745
	(-0.95)	(-2.00)	(0.04)	(-0.56)	(-1.72)	(0.35)	(-0.39)	(-1.95)	(0.67)
EPS	1.144	-136.371	1.500	1.612	-150.003*	1.953	1.132	-150.437	1.416
	(0.84)	(-1.52)	(0.91)	(1.02)	(-1.67)	(1.01)	(0.78)	(-1.65)	(0.86)
Age	-6.563**	-4.333	-6.813**	-7.081**	-4.759	-7.244**	-6.210**	-8.423	-5.824**
	(-2.41)	(-0.59)	(-2.29)	(-2.58)	(-0.65)	(-2.44)	(-2.37)	(-1.10)	(-2.08)
P/E ratio	0.026	0.420	-0.037	-0.043	0.190	-0.061	0.021	-0.055	0.055
	(0.26)	(1.24)	(-0.40)	(-0.48)	(0.53)	(-0.66)	(0.24)	(-0.15)	(0.60)
Ln(Over subscription multiple)	8.697***	10.999**	8.820***	11.790***	14.323**	10.227***	7.447***	7.810	6.896**
	(3.82)	(2.08)	(3.21)	(4.83)	(2.54)	(3.67)	(2.94)	(1.16)	(2.40)
Price Revision	-4.765***	-5.276***	-4.540***	-4.707***	-5.096***	-4.530***	-3.228***	-3.543***	-3.170***
	(-9.06)	(-4.85)	(-7.42)	(-8.96)	(-4.67)	(-7.45)	(-6.06)	(-3.18)	(-5.03)
Volume	0.798***	1.509***	0.687***	0.714***	1.288***	0.652***	0.814***	1.445***	0.744***
	(6.14)	(5.33)	(5.07)	(5.69)	(4.34)	(4.94)	(5.79)	(4.51)	(5.02)

Market Return	0.989***	1.525***	0.907***	1.058***	1.662***	0.927***	0.790***	1.001**	0.763***
	(5.39)	(3.59)	(4.35)	(5.73)	(3.86)	(4.45)	(4.11)	(2.15)	(3.54)
Gem	-9.913***	-30.979	-7.797**	-10.322***	-23.926	-8.064**	-9.484***	-25.111	-6.870**
	(-3.08)	(-1.61)	(-2.29)	(-3.21)	(-1.11)	(-2.34)	(-3.16)	(-1.13)	(-2.14)
Year	-13.800***	-11.269***	-14.330***						
	(-8.63)	(-3.63)	(-7.01)						
Year1				-27.192***	-22.215***	-28.820***			
				(-7.03)	(-3.63)	(-4.60)			
Year2				16.718***	16.235**	16.514**			
				(3.71)	(2.00)	(2.42)			
Period 2006-2011	83.518***	59.386***	93.351***	121.849***	91.191***	129.503***			
	(7.82)	(3.11)	(6.92)	(8.81)	(3.91)	(6.96)			
Constant	76.163**	-13.675	81.746**	-43.994	-105.217	-32.229	114.796***	64.745	134.414***
	(2.50)	(-0.19)	(2.26)	(-1.43)	(-1.42)	(-0.89)	(3.59)	(0.81)	(3.66)
Year dummy	No	No	No	No	No	No	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Y	Y	Y
Observations	1,171	254	917	1,171	254	917	1,171	254	917
Adjusted R^2	0.567	0.480	0.574	0.574	0.486	0.578	0.614	0.539	0.612

Table VIII. IPO Initial Return and Gross Spread: Sub-sample Regressions

This table presents the subsample regressions of IPO initial return on issue and underwriter variables, with the first three columns for the period of 2001-2005 and the other three columns for the period of 2006-2011. The dependent variable is IPO initial return, which is the IPO's first-trading day closing price minus the offer price divided by the offer price. The gross spread is total underwriting fees and sponsorship as a percentage of the gross proceeds. Foreign bulge-bracket is a dummy variable that equals one if a foreign bulge-bracket bank is included as (co-) lead manager in the underwriting syndicate. Top lead manager is a dummy variable that equals one if a top-ranking underwriter is included as lead manager in the syndicate. Privatization is a dummy variable for state-owned-enterprise (SOE) issuers. Age is the logarithm value of the issuing firm's age at IPO plus one. Over subscription multiple is the number of shares subscribed by individual investors divided by the actual number of shares allocated to individual investors. Price revision is the change in offer price from the midpoint of the filing price range to the final offer price divided by the mid filing price. Volume is the first-day trading volume divided by the total shares outstanding. Market return is the market return one month before IPO. GEM is a dummy variable for IPOs listed on the Shenzhen Stock Exchange-Growth Enterprises Market. Year is a standardized year variable, which equals 0 for year 2001, 1 for year 2002, and so on. Industry dummies based on the China Securities Regulatory Committee (CSRC) industry classification are included. *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Period 2001-2005			Period 2006-2011		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	SOEs	non SOEs	All	SOEs	non SOEs
Ln (Proceeds)	-77.590***	-86.848***	-68.295**	-13.843***	11.067	-19.447***
	(-4.82)	(-4.01)	(-2.54)	(-3.68)	(1.12)	(-4.18)
Gross Spread	-8.419***	-4.397	-9.248**	0.746	5.147	0.373
	(-2.69)	(-1.15)	(-2.29)	(0.78)	(0.72)	(0.38)
Foreign bulge-bracket	66.717*	81.164*	-15.988	8.313	-9.348	16.069
	(1.82)	(1.92)	(-0.66)	(0.90)	(-0.61)	(1.63)
Top manager	10.132	18.262	6.514	-0.244	0.158	-1.019
	(1.22)	(1.40)	(0.53)	(-0.07)	(0.01)	(-0.29)
Number of lead managers				6.802	11.882	10.923
				(0.75)	(1.27)	(0.92)
Privatization	4.929			14.061*		
	(0.56)			(1.83)		
Ln (Revenue)	3.366	2.278	10.885	0.397	-9.678	1.059
	(0.59)	(0.29)	(1.11)	(0.17)	(-1.33)	(0.41)
EPS	9.970**	-495.931	15.686**	2.214	-91.577	2.223
	(2.25)	(-1.49)	(2.29)	(1.31)	(-0.91)	(1.10)
P/E ratio	-0.213	-0.938	-0.009	0.084	0.664*	0.073
	(-1.35)	(-1.14)	(-0.06)	(0.83)	(1.97)	(0.63)
Age	-9.297	-19.354*	7.361	-7.346**	-0.203	-7.773**
	(-1.01)	(-1.69)	(0.50)	(-2.57)	(-0.02)	(-2.56)
Ln(Over subscription multiple)	-6.970	-11.036	-1.454	13.762***	15.109**	11.793***
	(-0.70)	(-0.84)	(-0.14)	(5.35)	(2.12)	(4.17)
Price Revision	-0.041	0.801	0.238	-4.879***	-5.503***	-4.594***
	(-0.02)	(0.18)	(0.12)	(-9.17)	(-4.53)	(-7.53)
Volume	1.964***	0.821	3.187***	0.605***	1.185***	0.557***
	(4.11)	(1.41)	(3.38)	(5.09)	(3.42)	(4.64)
Market Return	1.601*	1.924**	1.543	1.099***	1.560***	0.980***
	(1.85)	(2.06)	(0.86)	(5.83)	(3.20)	(4.67)
Gem				-9.610***	-29.976	-9.259***
				(-2.91)	(-1.22)	(-2.60)
Year	-27.859***	-32.942***	-31.587***	-11.704***	-12.641***	-12.532***
	(-4.42)	(-4.31)	(-2.72)	(-6.19)	(-2.63)	(-5.62)
Constant	447.259***	634.171***	272.389	107.435***	-45.385	148.346***
	(3.28)	(3.47)	(1.52)	(3.07)	(-0.47)	(3.61)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	182	106	76	989	148	841
Adjusted R^2	0.573	0.581	0.551	0.593	0.521	0.595

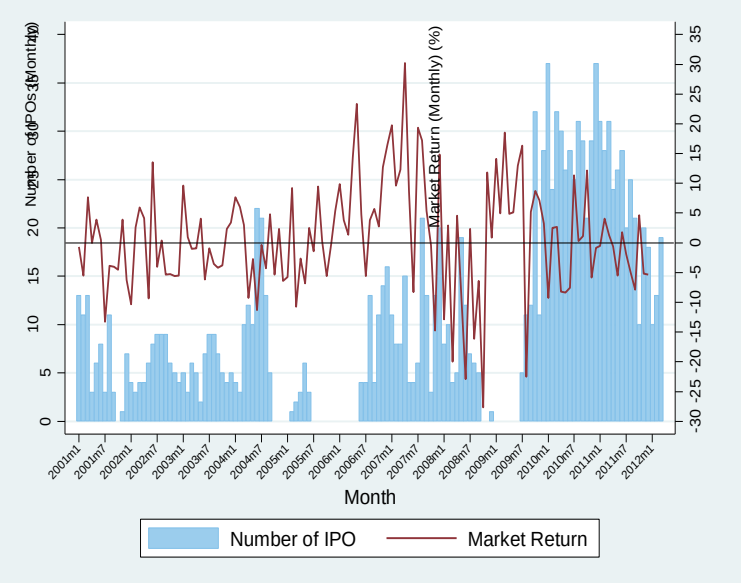

Figure 1. Number of IPOs and Market Returns. The sample contains all 1,320 Chinese IPOs conducted in the period from the first month of 2001 to the last month of 2011.

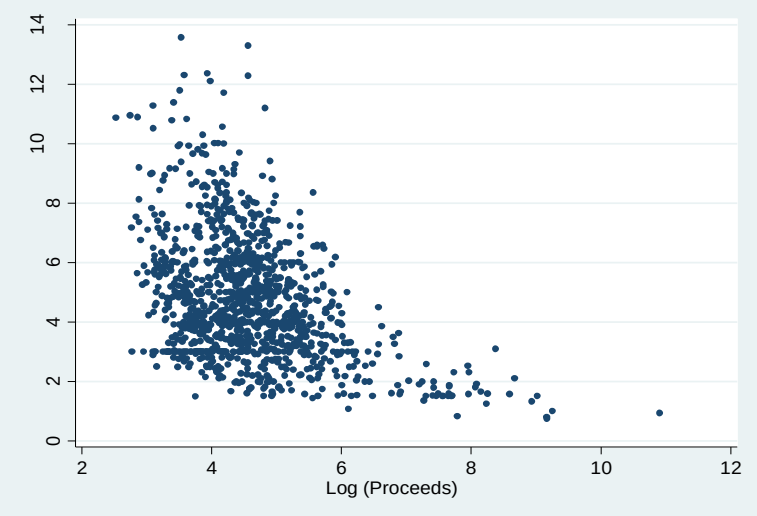

Figure 2. **IPO Gross Spreads and Proceeds.** The sample contains 1,171 Chinese IPOs from 2001 to 2011. The gross proceeds do not include overallotment options and are reported in 2011 million U.S. dollars. Gross spread is the total underwriting fees and sponsorship expenses as a percentage of the proceed.

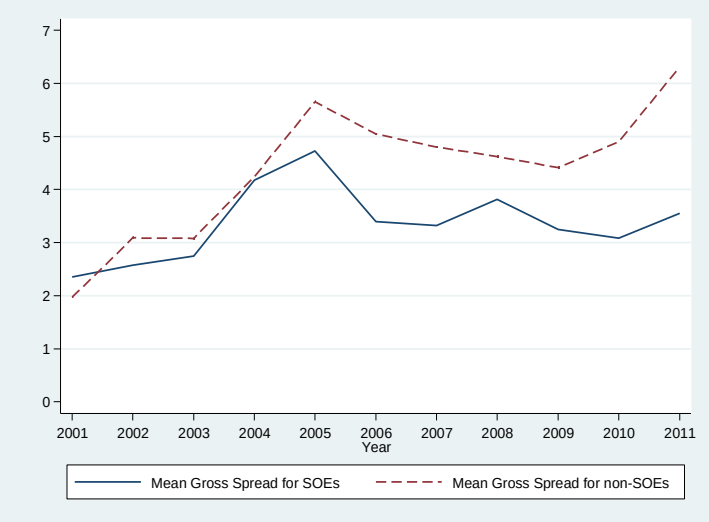

Figure 3. Gross Spreads: SOEs vs. non SOEs. This figure shows the mean IPO gross spreads for SOE and non-SOE IPOs, separately. The sample contains 254 SOEs and 917 non-SOEs. IPO gross spread is the total underwriting fees and sponsorship expenses as a percentage of the proceeds

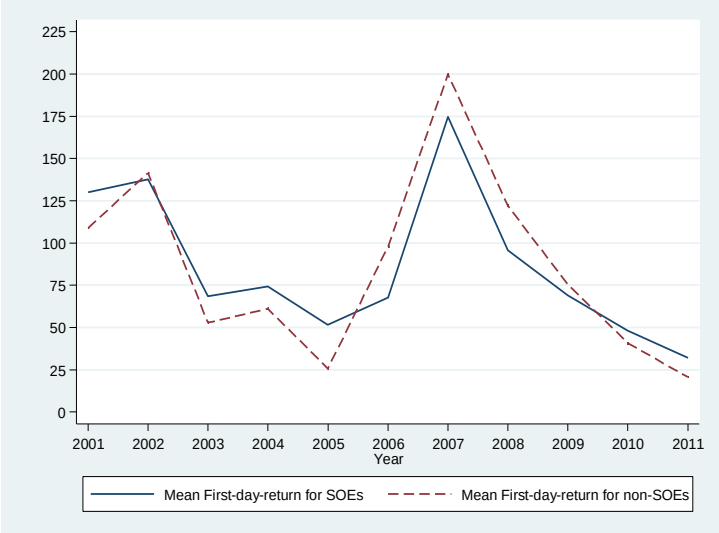

Figure 4. IPO Initial Returns: SOEs vs. non-SOEs. This figure shows the mean IPO initial return for SOE and non-SOEs, separately. The sample contains 254 SOEs and 917 non-SOEs. IPO initial return is the first trading day closing price minus the offer price divided by the offer price.

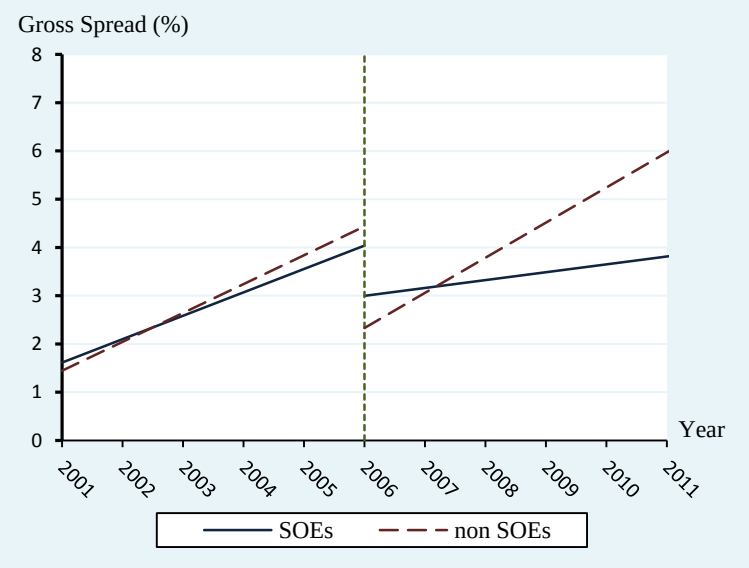

Figure 5. Estimated IPO Gross Spread. This figure depicts the year trend of the gross spreads, during the years 2001-2011 and separating between SOEs and non-SOEs, using estimates from the regressions in Table VI. The slopes in the figure are determined based on the coefficients on relevant year variables.

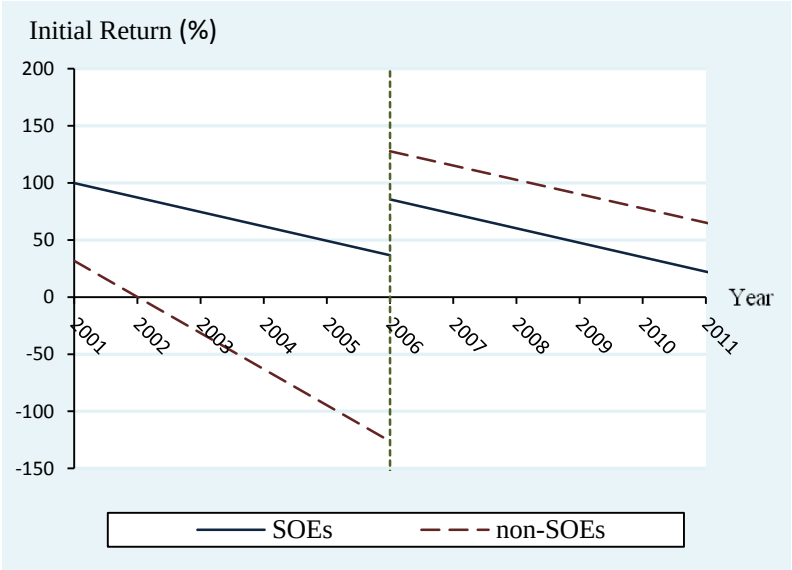

Figure 6. Estimated IPO Initial Return. This figure depicts the year trend of the initial return, during the years 2001-2011 and separating between SOEs and non-SOEs, using estimates from the regressions in Table VIII. The slopes in the figure are determined based on the coefficients on relevant year variables.