

Social Connections between Investment Bankers and Issuer Executives, IPO Underpricing, and Post-IPO Performance: Evidence from China^{*}

Shuwei Sun, Xianjie He, and Xun Hu¹

Received 18th of December 2017 Accepted 11th of April 2018

© The Author(s) 2018. This article is published with open access by The Hong Kong Polytechnic University

Abstract

Using a sample of Chinese firms preparing for an initial public offering (IPO) during the period 2004 to 2012, this paper investigates the effect of social connections between investment bankers and issuer executives (IEs' connections) on the outcomes of IPOs. On the basis of three-year post-IPO stock returns, we find that IEs' connections are negatively correlated with IPO underpricing and that firms with socially connected investment bankers outperform those without socially connected investment bankers. We then document the effect of social connections on other IPO outcomes, finding that firms with IEs' connections have a higher ratio of overfunding, a lower rate of changing investment projects after raising money through a public offering, and higher investment efficiency within three years of the IPO. The cross-sectional analyses show that the effect of IEs' connections on underpricing and post-IPO performance is more obvious in non-state-owned enterprises (non-SOEs) and areas with a less developed financial environment. The results of this paper help elucidate the impact of relationship-based financial intermediaries on capital market activity and may be relevant for Chinese reform of the IPO system.

Keywords: Social Connection, Investment Banker, Executives, Underpricing, Post-IPO Performance

^{*} We gratefully acknowledge the helpful comments received from Gang Hu (editor) and an anonymous reviewer. Shuwei Sun acknowledges financial support from the National Natural Science Foundation of China (No. 71602112). Xianjie He acknowledges financial support from the National Natural Science Foundation of China (No. 71472113; No. 91746117; No. 71272008), the Shanghai Philosophy and Social Science Foundation (No. 2014BJB007), and the MOE Project of Key Research Institutes of Humanities and Social Sciences at Universities project (No. 14JJD630010). Xun Hu acknowledges financial support from the Shanghai Pujiang Program (No. 13PJC047).

¹ Corresponding Author: Shuwei Sun, School of Accountancy, Shanghai University of International Business and Economics; e-mail: sunsw@suiibe.edu.cn. Xianjie He, Institute of Accounting and Finance, Shanghai University of Finance and Economics. Xun Hu, School of Accountancy, Shanghai University of Finance and Economics.

关系型金融中介、IPO 抑价与长期市场表现：基于保荐代表人与高管的社会关系的考察

孙淑伟 何贤杰 胡浔

摘要

本文以 2004-2012 年间在我国 A 股市场进行 IPO 的 1,232 家公司为研究样本，考察了保荐代表人与高管之间的社会关系对 IPO 抑价及长期市场表现的影响。实证结果表明，如果保荐代表人与 IPO 公司高管存在社会关系，那么该公司的抑价率显著地更低，上市后 3 年内的市场业绩表现得更好。接着，本文发现关系型公司 IPO 超募资金比例更高；上市后 3 年内募集资金用途变更的程度更低；上市后 3 年内的投资效率更高。最后，横截面上的分析表明，关系型金融中介的这一影响在民营企业和金融发展环境较落后的地区表现得更加明显。本文的研究成果有助于理解关系型金融中介对资本市场活动的影响，也可能为中国的新股发行制度改革提供一定的启示意义。

关键词：社会关系、保荐代表人、高管、抑价、长期市场表现

I. Introduction

In the past two decades, the Chinese initial public offering (IPO) system has undergone major reforms, and since 2004, it has been a sponsor-based system requiring regulatory approval. Although the original intention of each reform was to better bring into play the resource allocation function of the capital market, poor performance and even “sudden downturns” have occurred frequently after IPOs. This frequent underperformance reduces the efficiency of resource allocation throughout the capital market and even damages the role played by the capital market in serving Chinese economic transformation and improvement. Moreover, the IPO process involves all aspects of the capital market and numerous participants. Thus, regulators, issuers, and financial intermediaries² all face the task of minimising information asymmetry to identify high-quality enterprises.

Booth and Smith (1986) proposed the certification hypothesis, which states that an investment bank as a financial intermediary provides investors with a guaranteed mechanism that helps them trust the authenticity of the information disclosed by the company, allowing the issue price to reflect the real value of the company. This hypothesis has led scholars to focus on the influence that the reputation of an investment bank has on its certification function. Researchers have examined the effects of reputation on pre-IPO earnings management, underpricing, post-IPO performance, and other factors and have shown that a reputable investment bank provides a more accurate certification.

However, in a column in *The New York Times*, Greg Smith, a former executive at a top global investment bank (Goldman Sachs), proposed that investment banks provide clients with questionable value and that investment bankers’ personal capital plays an important role in that profession.³ The plummeting post-IPO stock performance of Facebook on the NASDAQ disappointed investors. American investors widely believe that Michael Grimes, the investment banker who presided over the IPO of Facebook, should be held responsible for this dramatic fall in the post-IPO stock price.⁴

A number of academics have noted the important role of the individual banker. For example, Fang (2005) argues that large underwriters’ selling and distributional power is “a relationship-based asset, relying heavily on the (sometimes personal) relationships between individual bankers and investors.” Chemmanur *et al.* (2017) use a novel dataset from Mergermarket Ltd. (a subsidiary of the *Financial Times*) that provides data on investment bankers working in mergers and acquisitions (M&A), revealing that individual investment bankers have a significant effect on the performance of M&A deals. Limited by data

² Financial intermediaries involved in an IPO include the sponsor (also known as the investment bank or underwriter), the sponsor’s representative (the investment banker), and accounting firms and other institutions or individuals.

³ See “Why I am Leaving Goldman Sachs” (*New York Times*, 12 March 2012) by a former Goldman Sachs investment banker.

⁴ See “Star banker is on the spot; Morgan Stanley’s Michael Grimes draws some flak for Facebook’s IPO flop” in *The Wall Street Journal* Eastern Edition, 2012.

accessibility, the authors were unable to conduct studies in the IPO field. Capital markets in the US and other countries do not publicly disclose the names and background information of investment bankers who are responsible for IPO projects (Yang *et al.*, 2016). Although discussed by practitioners, examining the influence of the personal capital of investment bankers on IPOs in the US or elsewhere is difficult given the limited data availability. China applies a special sponsor system that amplifies the role of individual investment bankers during the IPO process. Meanwhile, bankers' personal information (e.g. educational experience) is made public on the websites of the China Securities Regulatory Commission (CSRC) and the Securities Association of China (SAC).⁵ This unique disclosure requirement allows us to explore the impact of investment bankers' personal capital on IPO outcomes, which is currently a matter of conjecture without solid evidence.

In May 2012, *The Wall Street Journal* published a report noting that in the Silicon Valley circle, which is difficult for outsiders to access, social connections usually contribute to closing business deals. Given the important role of individual investment bankers during the IPO process, social connections have also been shown to exert considerable influence over agents' behaviour in an array of economic activities (Rauch, 2001; Granovetter, 2005), especially in China's guanxi-based society (Luo *et al.*, 2015; Du and Lai, 2017; Li, 2017). Many business and economic transactions are carried out within social networks in China (Wong, 2014), and relational transactions are more common in China than in most developed countries such as the US. Despite the economic importance of IPOs, previous research on the effect of social ties during the IPO process is sparse. Existing papers on IPO settings mainly focus on the social connections of organisations in the IPO market, such as institutional investors and underwriters. Some scholars find that the information and knowledge needed to create value lie in the individual worker and not in the organisation at which the individual is employed (Gul *et al.*, 2013; Chemmanur *et al.*, 2017). Following this logic, individual social connections between issuer executives and investment bankers (IEs' connections) may generate a substantial influence on IPO outcomes as connections at the institutional level. Specifically, IEs' connections may add value to issuers.

We have manually collected information on the university attendance of executives⁶ and investment bankers for companies that issued new shares in the Chinese A-share market from 2004 to 2012. We find that if IEs' connections exist, then a company's underpricing will be significantly lower and its market performance within three years of the IPO will be better. This effect is more obvious in non-state-owned enterprises (non-SOEs) or areas with a less developed financial environment. Next, this paper discusses the amount of money raised (*Overfunding*), changing investment projects after raising money through a public

⁵ The personal information of investment bankers was posted on the CSRC website before 2010 and was posted on the SAC website after 2010.

⁶ Executives include members of the board of directors, members of the board of supervisors, and senior managers of the IPO firm.

offering (*Change*), and the post-IPO investment efficiency (*Efficiency*) of IPO companies that engaged relationship-based investment bankers. The results show that relationship-based companies have a higher degree of overfunding, a lower rate of changing investment projects related to raising money within three years of the listing date, and higher investment efficiency within three years of the listing date. Finally, this paper uses subsamples of social connections and post-IPO accounting performance to conduct a robustness test. Specifically, we limit executives to the level of chairman (deputy) and CEO (deputy) and limit the age gap between both parties in the social connection to four years as criteria to reconstruct indicators of social connections. We also use the change in accounting performance (ΔRoe) as the measure of post-IPO performance. The results still support the hypotheses of this paper.

Thus, the contribution made by this paper relative to the prior literature is threefold. First, this paper expands the literature in the field of financial intermediary information certification already studied by practitioners and academics. Existing studies have examined how the reputation of an investment bank (institutional level) influences IPO-related activities such as IPO underpricing, earnings management, and long-term stock performance (Guo and Zhao, 2006; Xu and Luo, 2007; Chen *et al.*, 2013). Currently, scholars are beginning to closely study whether the influence of investment banks on economic activity originates at the institutional level or at the individual level of the investment banker. Data availability is an important constraint for any study analysing the role of individual investment bankers. In particular, data linking investment bankers to specific IPO deals are difficult to obtain. The results of this paper show that social connections between investment bankers and IPO firm executives can also affect IPO underpricing and post-IPO performance. Our paper expands the literature in this field.

Second, this paper is a helpful supplement to the literature in the field of social connections in capital markets. Existing studies have generally supported the view that social connections can accelerate information flow and provide an information advantage to one side of the social network. Cohen *et al.* (2008) document that mutual funds make more investments in the equity of companies whose directors graduated from the same educational institutions as the fund managers. These mutual funds perform significantly better on such investments relative to those in unconnected companies. Additionally, scholars have provided evidence that social connections increase transaction costs (Cai *et al.*, 2016). Although social connections are vital to capital market activity, most studies on social connections in the context of IPOs revolve around business relations at the institutional level (for example, investment bank, mutual fund, and audit firm), whereas few studies examine social connections at the personal level (Sherman, 2000; Sherman and Titman, 2002). By using unique data from China, this paper examines how social connections between investment bankers and executives influence resource allocation efficiency in the IPO market.

Third, the conclusions of this paper may have referential value for Chinese reform of the IPO system. The sponsor system, as a system that can coexist with the registration system, has been adopted by certain Commonwealth countries. Chinese investment bankers conduct specific underwriting and sponsoring work as sponsor representatives and undertake responsibilities and risks as individuals, which is a unique feature under the Chinese institution. Foreign exchange sponsors are all institutions and do not designate an investment banker. Large-sample empirical results show that the personal capital of an investment banker can influence IPO outcomes. The Chinese IPO system is now in transition to a registration system, and further improving the information disclosure mechanism for intermediary participants under the registration system can provide incremental information to regulators and investors, allowing them to make more informed supervision and investment decisions.

The rest of the paper is organised as follows. The next section provides a literature review and then develops our main hypotheses. Section III describes our sample and research design. Section IV discusses our empirical analysis of the role of social connections in IPO underpricing and post-IPO performance. Section V investigates the effect of social connections on the other IPO outcomes. Section VI presents additional robustness tests, and section VII concludes the study.

II. Relation to the Existing Literature and Hypothesis Development

2.1 Relation to the Existing Literature

Granovetter (1985) argues that social connections can significantly affect economic activity in modern industrial society. Our paper is related to the existing literature on social ties in a capital market (Cohen *et al.*, 2008; Engelberg *et al.*, 2012; Cai *et al.*, 2016). The closest strand involves empirical studies on social connections in IPOs.

There are two main perspectives regarding connections during the IPO process. One view argues that these connections promote the resource distribution efficiency of the IPO market. For example, underwriters use their discretion over the allocation of underpriced IPO shares as a reward mechanism to elicit private information from institutional investors (Benveniste and Spindt, 1989). Institutional investors possess valuable private information about IPOs, play an important supportive role in the IPO aftermarket, and receive considerable compensation for their participation in IPOs (Chemmanur *et al.*, 2010). Similarly, Cooney *et al.* (2015) find that an investment bank is more likely to be included in an underwriting syndicate when it is connected to the IPO firm. For the IPO firm, the presence of social ties between the IPO issuer and the chosen underwriters is associated with net wealth gains for its pre-IPO shareholders.

By contrast, the second view argues that while social connections can be associated with benefits for one side, if enough participants are taken into account, they can also be

seen as undermining the IPO market. For example, Reuter (2006) finds a positive correlation between the long-term commissions paid by mutual funds to lead underwriters and the funds' reported holdings of IPOs underwritten by these same lead underwriters. This evidence suggests that the underwriters allocate underpriced IPOs for their own benefit at the expense of the issuing firms. Similarly, Nimalendran *et al.* (2007) posit that mutual funds may pay high commissions to investment banks by excessively trading stocks in order to receive shares of highly underpriced IPOs. The authors find consistent evidence that the trading volume of the 50 most liquid stocks near the offer date is positively correlated with IPO underpricing during the Internet bubble period (1999–2000). Goldstein *et al.* (2011) document that excessive trading commissions paid to the lead underwriter immediately preceding the IPO are positively associated with subsequent allocations (inferred from holdings at the end of the issue quarter) of underpriced IPOs. To ensure the quality of IPO firms, the CSRC has established the Issuance Examination Committee (IEC) to verify and approve IPO applications. Under this system, a firm that is to be listed can pursue an IPO on the Chinese stock market only if it is approved by the IEC (Du and Lai, 2017). Thus, a number of studies have examined the impact of the IEC's network on IPOs. For example, Du *et al.* (2013) find that connections with the IEC significantly increase the probability of firms' successful application. Chen *et al.* (2014) find that firms with IEC relations are more likely to be listed and that their performance in the IPO year is higher than that of a company without this relationship. Since November 2010, IPO firms in China have been required to disclose detailed data on the bidding prices of all participating institutions. Using these unique data, Luo *et al.* (2015) investigate the extent to which the business relationship with an underwriter affects an institutional investor's bidding behaviour in the book-building process. They find that institutional investors with a close business relationship with the underwriter are more likely to participate in bidding and that their bidding prices are more optimistic than those of other institutional investors. The underwriter uses the optimistic bidding price to set high issuing prices for IPO firms.

These studies of social connections in the IPO process have mainly been investigated at the institutional level (i.e. commission relationships, ownership relations, and ongoing relationships). Few studies examine the impact of social connections at the individual level on IPOs. According to our reading of the literature, only two published papers have examined the social connections of individuals in the IPO setting. Chahine and Goergen (2013) study the two potentially contrasting effects on IPO pricing and post-IPO operating performance of family ties and social ties between top management and board members. They find that IPO performance is positively related to the strength of social ties but negatively related to the strength of family ties. Using the same data, Chahine and Goergen (2014) find that both social ties and family ties increase pay-performance sensitivity (PPS) and that PPS improves IPO performance.

2.2 Social Connections between Investment Bankers and Issuer Executives and IPO Underpricing

IPO underpricing means that the price of new stocks is lower than the actual value of the corporation. An overly high degree of underpricing reduces the amount of money available for investing in new projects, causing a loss to existing stockholders and damaging the efficiency of the resource allocation in the capital market. The level of underpricing in the Chinese capital market is much higher than that in developed capital markets. Studies on IPO underpricing are largely based on information asymmetry theory and agency theory. The papers discussed below found that sufficient information disclosure can ameliorate information asymmetry and agency problems, thus reducing IPO underpricing. Beatty and Welch (1996) provide evidence that the number of risk factors disclosed in a firm's prospectus is related to IPO underpricing. Yao and Zhao (2016) find that greater disclosure of total risks, financial risks, and operational risks reduces IPO underpricing.

Bertomeu and Marinovic (2016) report that information on corporate value can be divided into hard information and soft information. The major attributes of soft information are that it is personal and relies more on contact and communication between people; its contents are also subjective. By contrast, hard information is often quantifiable and impersonalised, which means that neither mutual familiarity nor any individual arrangement will influence information collection. In terms of transmission mode and cognitive style, soft information relies on the relationship established by both parties, while hard information rises above such connections. In the context of an IPO, it is impossible to measure, and difficult to convey in publicly disclosed materials, information about intimacy between the firm and the government, the use of the funds raised, the personal capital of managers, intangible assets, and R&D if the public disclosure of this soft information is likely to divulge corporate trade secrets. For example, it is difficult to imagine listed companies that rely on government-business relations divulging such secrets by making their bribery public (Li, 2017).

From the perspective of information asymmetry, evaluating corporate operating conditions with publicly disclosed information is less reliable in a unique relationship-based society such as China. Fan *et al.* (2014) reveal that government-business relations significantly reduce the value relevance of accounting earnings. To reduce information asymmetry, the certification literature has argued that the role of the investment bank is that of a producer of noisy information about the firm that it takes public and a transmitter of that information to potential investors (Chemmanur and Fulghieri, 1994).

However, unlike the certification literature, which has argued that the investment bank uses its reputation as a certification mechanism, our paper postulates that the investment banker collects noisy (soft) information about the IPO firm through connections with issuer executives and then disseminates this information to potential investors.

Social connections can facilitate the dissemination of soft information within a social network. For example, Nooteboom (2002) notes that trust between members in a network can decrease future uncertainties and facilitate the mutual exchange of information. Social connections act on capital market activity by increasing the trust between insiders, and mutual trust is manifested in the sharing of sensitive information, hence establishing a more stable cooperative relationship.

In the context of an IPO, IEs' connections could allow them to more deeply and more smoothly communicate sensitive information about the firm, whereas those investment bankers who do not have social connections with executives do not have access to such information. Relationship-based investment bankers may convey soft information on corporate quality to the capital market. By contrast, non-relationship-based investment bankers are in a relatively disadvantageous position when conveying information to the market because they are unable to acquire soft information or can obtain only a small amount of such information. Meng *et al.* (2016) find that the behaviour of individual investors can drive post-IPO prices to deviate from fair values and lead to market misvaluation. The high IPO initial returns in China's ChiNext market result primarily from market misvaluation rather than deliberate underpricing. Hence, the information asymmetry between the company that engages relationship-based investment bankers and external investors is lower.

From the perspective of agency theory, the issuer and investment bankers constitute a principal-agent relationship. The IPO price is influenced not only by government regulations and primary market demand but also by the investment banker's pricing and marketing efforts. Traditional pricing theory states that because of trust problems, investment banks tend to adopt an underpricing issuance strategy to ensure the success of the public offer and to build a good reputation. Moreover, the sales efforts of investment bankers are the private information of agents; as a principal, the issuer cannot know that information in advance, resulting in an agency problem.

As a professional in the capital market, the investment banker has more experience, knowledge, and resources in terms of capital market operation and laws and regulations. Compared with the investment bankers, issuer executives are mostly pragmatic elites who sometimes play a main role in IPO underpricing since they may retain a large stake in the firm to credibly signal its quality and commitment to future pro-market policies and activities (Su, 2004). If the investment banker and the issuer executive have established a relationship based on social connections prior to the IPO, mutual trust between principal and agent eases the agency problem. Schenone (2004) argues that relationships can reduce the agency problem and investigates the effects of pre-IPO banking relationships on a firm's IPO. The results show that firms with a pre-IPO banking relationship with a prospective underwriter face approximately 17% lower underpricing than firms without such banking

relationships. Hence, Hypothesis 1 is proposed:

H1: Connections between investment bankers and issuer executives are negatively related to IPO underpricing.

2.3 IEs' Connections and Post-IPO Performance

In the pre-IPO period, all Chinese enterprises must go through a long stage of material preparation, which normally takes at least three years; during this period, an investment banker should guide the company. After the IPO, the investment banker also needs to continuously supervise the company. Both guidance and supervision require long-term communication and cooperation between investment bankers and executives, and the degree of smoothness and stability of their cooperation determines the quality of the company. Benveniste and Spindt (1989) and Benveniste and Wilhelm (1990) argue that investment banks and companies are unable to precisely evaluate corporate real value since they do not have all the information on corporate value. Moreover, the information, knowledge, and experience they have are different. Executives possess public and non-public information related to firm-specific characteristics and play a decisive role in corporate fund utilisation and investment projects.

The investment banker acts as a link among the CSRC, the issuer, and other intermediaries in three specific ways. First, the investment banker offers corporate governance guidance and is responsible for formulating application documents. Second, the investment banker should organise and coordinate securities agencies and their signatories to participate in work related to securities issuances. The issuer hires the accounting firm, law firm, asset evaluation agencies, and other securities service agencies, and the investment banker can recommend that the issuer change agencies if there is any reason to believe that the professional abilities of those agencies are obviously defective. Third, it is necessary to train all directors, supervisors, and senior executives in the systematic knowledge of regulations and the securities market, ensuring that they comprehensively grasp the laws, regulations, and rules pertaining to public offers and standard operations and learn about the responsibilities and obligations pertaining to information disclosure and fulfilment. To summarise, the degree of cooperation between the sponsor representative and executives influences corporate behaviour.

The sociology literature notes that social ties allow these two sides to become more familiar with each other, which promotes trust between them (Granovetter, 1985). Regarding the decision on when to participate in capital market activities, the two sides are influenced by each other. In contrast to personnel without social ties, the trust between the two sides with social ties can ensure that they do not need to spend time and resources estimating the changes in each other's behaviour while also greatly improving the efficiency of the organisation. Specific to research in the capital market, Engelberg *et al.* (2012) find

that when banks and firms are connected through interpersonal linkages, such as their respective managers having attended the same colleges or previously worked together, bank loan interest rates are markedly reduced. Shue (2013) argues that peer interactions could affect managerial decision-making because information and beliefs travel through social networks.

Therefore, a high degree of trust based on social connections between investment bankers and executives encourages them to fully share information in the pre-IPO preparatory stage and the post-IPO constant supervision stage, enhancing their understanding of the state of the company's business and the risks that it faces. Trust can enhance the efficiency of mutual cooperation, reduce the probability of error, and help the company make the right decisions regarding an IPO, such as whether to invest funds in a higher-quality project, the reasonable use of funds, and so on. These good decisions ultimately boost the post-IPO long-term market performance of the issuer. Hence, Hypothesis 2 is proposed:

H2: Connections between investment bankers and issuer executives are positively related to post-IPO performance.

III. Sample and Research Design

3.1 Sample

Our sample consists of all IPOs in China from 2004 to 2012. For each IPO, we hand collect the investment banker's signature in the prospectus. Then, we collect individual investment bankers' demographic information, including age and education. All of the information gathered is from the SAC and the CSRC. For investment bankers not shown on these two websites or who resigned, the data are supplemented through a Baidu search and the China Credit Trust database. Issuer executives' demographic information is also hand collected from annual reports and prospectuses. Missing information is supplemented through an Internet search.

Corporate financial data, stock price data, and data on the market shares of underwriters are gathered from the WIND and CSMAR databases. In addition, to alleviate the influences of potential abnormal values, we winsorise all continuous variables at the 1% and 99% levels.

3.2 Empirical Models

We estimate the following regression model to test our hypotheses:

$$\begin{aligned}
 \text{Underpricing}_i = & \alpha + \beta_1 \text{Ties_IE}_i + \beta_2 \text{Size}_{i,t-1} + \beta_3 \text{Lev}_{i,t-1} + \beta_4 \text{Sales_growth}_{i,t-1} \\
 & + \beta_5 \text{Lshare}_{i,t-1} + \beta_6 \text{Reputation}_{i,t-1} + \beta_7 \text{Big4}_{i,t-1} + \beta_8 \text{Top10}_{i,t-1} \\
 & + \beta_9 \text{SOE}_{i,t-1} + \beta_{10} \text{Political}_i + \beta_{11} \text{Pricing_Regime1}_i \\
 & + \beta_{12} \text{Pricing_Regime2}_i + \sum \text{Industry} + \sum \text{Year} + \varepsilon
 \end{aligned} \tag{1}$$

$$\begin{aligned}
BHAR_i = & \alpha + \beta_1 Ties_IE_i + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Roe_{i,t} + \beta_5 Sales_growth_{i,t} \\
& + \beta_6 Lshare_{i,t} + \beta_7 Reputation_{i,t-1} + \beta_8 Big4_{i,t-1} + \beta_9 Top10_{i,t-1} + \beta_{10} SOE_{i,t-1} \\
& + \beta_{11} Political_i + \beta_{12} Pricing_Regime1_i \\
& + \beta_{13} Pricing_Regime2_i + \sum Industry + \sum Year + \varepsilon
\end{aligned} \tag{2}$$

Eq. (1) tests the validity of Hypothesis 1, whereas Eq. (2) tests the validity of Hypothesis 2. Following Hu and Feng (2013) and Weng *et al.* (2014), firm *i*'s underpricing is the initial return, adjusted for the market return as follows:

$$underpricing_i = \frac{P_{i,l,c} - P_{i,o}}{P_{i,o}} - Mreturn_{i,l,j}$$

$P_{i,l,c}$ is the closing price of issuer *i* on the listing day (*l* day). $P_{i,o}$ is the offer price of issuer *i*. $Mreturn_{i,l,j}$ is the market return on issuer *i*'s listing day (*l* day) of board *j* on which issuer *i* is listed. Board *j* is made up of the following three markets: main board, small and medium enterprise board, and growth enterprise board.

$BHAR_i$ is the buy-and-hold abnormal returns over one year/two years/three years after the listing date.

Following Guan *et al.* (2016), our main test variable, $Ties_IE_i$, in Eq. (1) and Eq. (2) equals one if any of issuer *i*'s top executives has a common alma mater with any of the signing investment bankers and zero otherwise. Specifically, this variable indicates whether any of them attended the same universities regardless of whether they attended the same school in the same periods.

A number of studies document that issuers' financial characteristics influence IPO outcomes (Su, 2004; Fan *et al.*, 2007; Tian, 2011; Hu and Feng, 2013). Following these papers, we control for issuers' financial characteristics, such as the logarithm of the issuer's total assets (*Size*), leverage (*Lev*), returns on common stockholders' equity (*Roe*), a variable indicating the shareholding ratio of the largest shareholder (*Lshare*), and the growth potential of the issuer (*Sales_growth*). As shown in prior studies (Hu and Feng, 2013; Tian and Zhang, 2013), several institutional factors are found to affect IPO outcomes in China. Specifically, we include a variable to indicate whether a firm is state controlled (*SOE*), a variable indicating a Big 4 audit firm (*Big4*), a variable indicating a domestic top 10 audit firm (*Top10*), and a variable indicating the reputation of the underwriter, measured as the market share of the underwriter of IPO firm *i* in terms of proceeds raised in the pre-IPO year *t-1* time period. Previous studies also report a significant influence of the issuer's political connections on the IPO pricing process (Fan *et al.*, 2007; Tian and Zhang, 2013). To control for the impact of political connections, we include *Political*, an indicator of whether the CEO hired by the issuer is currently or was formerly a delegate to the National People's Congress, a member of the CPPCC (Chinese People's Political Consultative Conference), or an officer of the central government, a local government, or the military.

It is also important to control for a number of characteristics of China's IPO market. Chen *et al.* (2016) examine how different IPO pricing regimes affect the reporting quality of IPO firms in China and find that this quality is higher when IPO offer pricing is determined by market forces rather than by securities regulators. From November 2001 to 7 December 2004, China's new share issuance had a fixed price, with a cap of 20 times the price-earnings ratio. From 8 December 2004 to 10 June 2009, the price of new shares was based on the "accumulated bidding inquiry system". Under this system, the price of a new share is uncertain and can only be determined through a "road show inquiry". On 10 June 2009, the CSRC issued guidance on further reform and improvement of the issuance system for new issues which further formed a market-based pricing mechanism. Therefore, we divide the sample into three periods: November 2001 to 7 December 2004; 8 December 2004 to 10 June 2009; and 11 June 2009 to 31 December 2012. *Pricing_Regime1* equals one if the listing date of the IPO firm is from 8 December 2004 to 10 June 2009 and zero otherwise. *Pricing_Regime2* equals one if the listing date of the IPO firm is from 11 June 2009 to 31 December 2012 and zero otherwise.

IV. Empirical Analyses

4.1 Descriptive Statistics

We begin with the population of Chinese IPO firms listed in the A-share market between 2004 and 2012 ($n = 1,232$). Table 1 lists the described the total sample and the subsample of companies that employed connected investment bankers. The number of IPO firms was the lowest in 2005, with 14, which was tied to the suspension of the new issue. The number of IPO firms was the highest in 2010, with 341, which was tied to the establishment of China's second board market (also called Growth Enterprise Market). In the two years following the introduction of the sponsor system for issuing new shares, the information disclosure of the background of investment bankers was relatively inadequate, which resulted in the lower sample size of the connected firms between 2004 and 2005. Since 2006, the proportion of firms with connected investment bankers has been basically stable. Overall, the figure was 17.13%.

Table 2 reports the descriptive statistics for the variables used in our multivariate regression analysis. The sample comprises 1,232 IPOs. Subsample A comprises 211 IPO firms where one of the issuer's top executives has a common alma mater with any of the signing investment bankers, while subsample B comprises 1,021 IPO firms without a connected investment banker. We also present the differences in dependent variables as well as all of the previously described control variables.

The mean (median) of underpricing is 0.579 (0.359) for the total sample. The difference in the mean (median) of underpricing between the two subsamples is statistically significant; the mean (median) is lower for subsample A with socially connected investment

bankers, with a t-value (Z-value) of -2.95 (-3.38). The differences in the means (medians) of buy-and-hold abnormal returns over 1 year/2 years/3 years between the two subsamples are also statistically significant. There is no discernible difference between the two subsamples for firm-related characteristics, such as the natural logarithm of year-end total assets (*Size*), the leverage ratio (*Lev*), the shareholding ratio of the largest shareholder (*Lshare*), state ownership (*SOE*), or the growth ratio of revenue (*Sales_growth*).

Table 1 Sample

Year	Total sample		Socially connected subsample of investment bankers employed	
	n	%	n	%
2004	99	8.04	7	7.07
2005	14	1.14	0	0.00
2006	63	5.11	9	14.29
2007	113	9.17	16	14.16
2008	76	6.17	15	19.74
2009	96	7.79	22	22.92
2010	341	27.68	60	17.60
2011	277	22.48	53	19.13
2012	153	12.42	29	18.95
Total	1,232	100	211	17.13

For underwriter-related and auditor-related characteristics, we find the IPO firms with connected investment bankers to be larger (*Reputation* and *Big4*). These firms are more likely to hire more reputable underwriters and Big 4 auditors.

4.2 Hypothesis Testing

In this section, we first report and discuss the regression analyses to test the hypothesis regarding the effect on IPO underpricing. Then, we discuss the regression analyses to test the hypothesis regarding the effect on the post-IPO performance, including *BHAR_1year*, *BHAR_2year*, and *BHAR_3year*.

Table 3 reports the estimates for Eq. (1). Column (1) is the regression result without adding any control variables. The coefficient of *Ties_IE* is -0.160 and significant at the 1% level (t-value = -2.95). Column (2) is the regression result after adding the control variables of firm-related characteristics and underwriter-related and auditor-related characteristics, but not the characteristics of China's IPO market. The coefficient of *Ties_IE* is -0.105 and significant at the 5% level (t-value = -2.02). Column (3) provides the regression results after adding all the control variables. The coefficient of *Ties_IE* is -0.087 and significant at the 5% level (t-value = -2.17). These results support Hypothesis 1.

Table 2 Descriptive Statistics of Variables

	Total sample (A+B)			Subsample A (<i>Ties_IE=1</i>)			Subsample B (<i>Ties_IE=0</i>)			Difference (A - B)	
	Mean	Median	Std.	Mean	Median	Std.	Mean	Median	Std.	t-Stat.	Z-stat.
<i>BHAR_1year</i>	-0.126	-0.113	0.466	-0.069	-0.099	0.389	-0.138	-0.116	0.479	1.95*	1.25
<i>BHAR_2year</i>	-0.045	-0.133	0.538	0.055	-0.097	0.569	-0.066	-0.145	0.529	3.00***	2.46***
<i>BHAR_3year</i>	-0.037	-0.136	1.231	0.255	-0.085	1.323	-0.097	-0.151	1.203	3.81***	2.80***
<i>Underpricing</i>	0.579	0.359	0.718	0.447	0.278	0.573	0.607	0.375	0.742	-2.95***	-3.38***
<i>Size</i>	20.229	19.995	1.131	20.442	20.024	1.480	20.185	19.980	1.040	1.43	1.33
<i>Lev</i>	0.479	0.487	0.166	0.468	0.484	0.171	0.481	0.489	0.164	-1.09	-1.02
<i>Roe</i>	0.090	0.083	0.035	0.088	0.085	0.031	0.090	0.083	0.035	-0.78	-0.36
<i>Lshare</i>	38.967	37.750	14.835	39.248	37.460	14.680	38.909	37.830	14.873	0.30	0.20
<i>Reputation</i>	0.032	0.016	0.049	0.042	0.021	0.066	0.030	0.015	0.044	3.22***	1.79**
<i>Big4</i>	0.042	0.000	0.201	0.085	0.000	0.280	0.033	0.000	0.180	3.43***	3.42***
<i>Top10</i>	0.491	0.000	0.500	0.483	0.000	0.501	0.493	0.000	0.500	-0.24	-0.24
<i>SOE</i>	0.200	0.000	0.400	0.204	0.000	0.404	0.199	0.000	0.399	0.16	0.16
<i>Sales_Growth</i>	0.289	0.241	0.274	0.303	0.248	0.278	0.287	0.239	0.274	0.78	0.93
<i>Political</i>	0.461	0.000	0.499	0.521	1.000	0.501	0.449	0.000	0.498	1.93*	1.93*
<i>Pricing_regime1</i>	0.216	0.000	0.412	0.190	0.000	0.393	0.221	0.000	0.415	-1.02	-1.02
<i>Pricing_regime2</i>	0.704	1.000	0.457	0.777	1.000	0.417	0.689	1.000	0.463	2.57***	2.57***

See the Appendix for definitions of all the variables. All continuous variables are winsorised at the first and 99th percentiles of their respective annual distributions. The t- and Z-statistics are obtained from t- and Wilcoxon tests that compare the two-sample differences in the mean and median values, respectively. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

The estimated coefficient of *Size* is -0.114, with a t-value of -5.65, suggesting that the larger the firm, the lower the IPO underpricing. This result is consistent with prior studies (Tian, 2011; Hu and Feng, 2013). We find that the coefficient of *Reputation* is significantly negative (coefficient = -0.926, t-value = -2.70), suggesting that the more reputable underwriters are associated with a smaller degree of underpricing. This result supports the certification theory (Booth and Smith, 1986). The coefficient on *Big4* is significantly positive. Our evidence on the Big 4 auditors is not consistent with prior studies in the US market (Titman and Trueman, 1986) but is consistent with a prior study in the China market (Hu and Feng, 2013). Using Chinese IPO firms listed from 2009 to 2011, Hu and Feng (2013) find that companies audited by the big audit firms had a higher degree of underpricing. In the current capital market environment of China, when a high-quality company goes public, it will inevitably receive inexplicit positive feedback. Therefore, high-quality companies are willing to issue shares at a higher degree of underpricing so that they can be separated from low-quality companies. At this time, the high-quality auditing is the signal mechanism of the real intrinsic value of the company, and is usually accompanied by the high degree of IPO underpricing, which is the signal function of a pre-IPO audit (Hu and Feng, 2013). The coefficient on *SOE* is significantly positive, with a t-value of 2.63. Previous studies suggest that state-owned enterprises (SOEs) are approved to issue stock on the basis of political factors and are of lower quality (e.g. Fan *et al.*, 2007; Yang, 2013); thus, SOEs have a higher degree of IPO underpricing. Our results are consistent with these findings. The coefficient on *Political* is significantly negative (coefficient = -0.061, t-value = -2.00), suggesting that issuers with political connections are associated with a lower degree of underpricing. Francis *et al.* (2009) also find that firms with political connections have relatively lower underpricing during the going-public process.

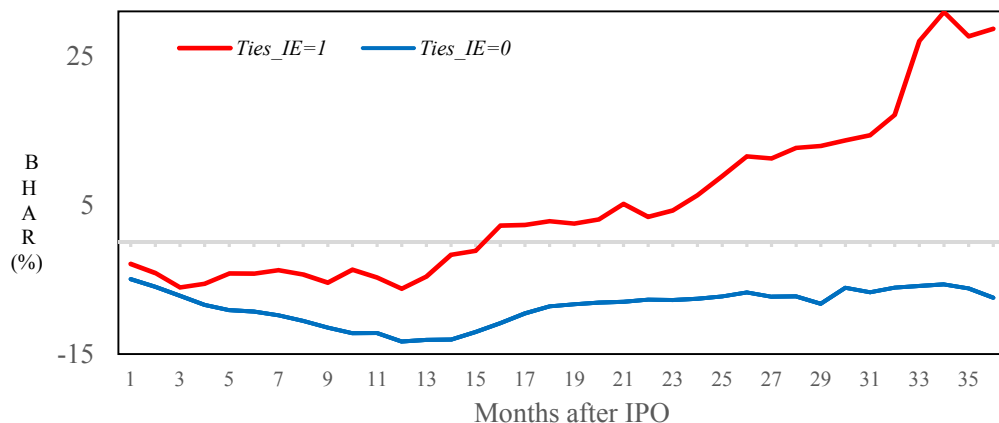
Figure 1 plots the mean buy-and-hold abnormal returns (*BHAR*) of newly listed companies in China sorted by whether or not they have hired connected investment bankers. The mean *BHAR* of the group of firms with connected investment bankers exhibits a decline over the 15 months subsequent to the listing day, but the mean *BHAR* of the group exhibits a rise of 28.7% over 36 months. The mean *BHAR* of the second group of firms exhibits a larger drop of 7.4% over 36 months. From this comparison, the stock performance of the newly listed firms is more attributable to the set of firms with connected investment bankers. Figure 1 preliminarily supports Hypothesis 2 of this paper.

We next perform regression analyses to examine the effects of the firms' connected investment bankers on post-IPO performance. Table 4 presents the results of our ordinary least squares (OLS) regressions using the one-, two-, and three-year *BHARs* as dependent variables. The results reported in Column (1) suggest that issuers underwritten by connected investment bankers exhibit superior one-year stock performance. The coefficient of *Ties_IE* is positive, with a t-value of 1.20. The results of Columns (2) and (3) of Table 4 show that

Table 3 The Effect of Social Connections on IPO Underpricing

	(1)	(2)	(3)
	<i>Underpricing</i>	<i>Underpricing</i>	<i>Underpricing</i>
<i>Intercept</i>	0.607*** (27.08)	3.673*** (8.18)	2.883*** (7.59)
<i>Ties_IE</i>	-0.160*** (-2.95)	-0.105** (-2.02)	-0.087** (-2.17)
<i>Size</i>		-0.174*** (-7.15)	-0.114*** (-5.65)
<i>Lev</i>		0.772*** (5.65)	0.182 (1.56)
<i>Sales_Growth</i>		0.004 (0.06)	-0.028 (-0.49)
<i>Lshare</i>		0.003** (2.31)	0.001 (1.28)
<i>Reputation</i>		-1.234*** (-2.79)	-0.926*** (-2.70)
<i>Big4</i>		0.343*** (3.08)	0.221** (2.52)
<i>Top10</i>		-0.114*** (-2.85)	-0.015 (-0.47)
<i>SOE</i>		0.385*** (7.34)	0.121*** (2.63)
<i>Political</i>		-0.097** (-2.48)	-0.061** (-2.00)
<i>Pricing_regime1</i>			-0.222 (-1.49)
<i>Pricing_regime2</i>			-0.285*** (-3.75)
<i>Industry</i>	No	No	Yes
<i>Year</i>	No	No	Yes
<i>N</i>	1,232	1,232	1,232
<i>R-squared</i>	0.007	0.122	0.502

This table presents the regression results estimated by the ordinary least squares method. See the Appendix for definitions of all the variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 1 Mean Post-IPO Buy-and-Hold Abnormal Returns (BHARs) from One to 36 months after the Initial Trading Day for 1,232 Firms in China that Went Public During the Period 2004 to 2012

the coefficient on *Ties_IE* is 0.078 (0.266) and significant at the 5% (1%) level. The results in Table 4 show that firms with connected investment bankers outperform those without socially connected investment bankers based on one-year/two-year/three-year post-IPO stock returns. These results support Hypothesis 2.

Table 4 The Effect of Social Connections on Post-IPO Stock Performance

	(1)	(2)	(3)
	<i>BHAR_1year</i>	<i>BHAR_2year</i>	<i>BHAR_3year</i>
<i>Intercept</i>	0.065 (0.25)	0.077 (0.23)	-1.188 (-1.43)
<i>Ties_IE</i>	0.033 (1.20)	0.078** (2.21)	0.266*** (3.04)
<i>Size</i>	-0.031** (-2.22)	-0.039** (-2.15)	-0.020 (-0.44)
<i>Lev</i>	0.033 (0.41)	0.066 (0.64)	0.128 (0.50)
<i>Roe</i>	3.110*** (9.31)	3.486*** (8.17)	5.018*** (4.74)
<i>Sales_Growth</i>	0.385*** (10.33)	0.642*** (13.49)	1.077*** (9.12)
<i>Lshare</i>	-0.000 (-0.37)	-0.000 (-0.38)	0.003 (1.16)
<i>Reputation</i>	0.668*** (2.83)	0.584* (1.94)	-0.062 (-0.08)
<i>Big4</i>	0.151** (2.49)	0.064 (0.83)	-0.176 (-0.92)
<i>Top10</i>	0.028 (1.32)	-0.008 (-0.28)	0.063 (0.92)
<i>SOE</i>	0.002 (0.06)	0.021 (0.52)	0.023 (0.23)
<i>Political</i>	0.069*** (3.28)	0.047* (1.77)	0.054 (0.82)
<i>Pricing_regime1</i>	-0.336*** (-3.26)	-1.275*** (-9.70)	-2.039*** (-6.25)
<i>Pricing_regime2</i>	-0.067 (-1.26)	0.117* (1.74)	0.356** (2.13)
<i>Industry</i>	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes
<i>Observations</i>	1,232	1,232	1,232
<i>R-squared</i>	0.438	0.313	0.192

This table presents the regression results estimated by the ordinary least squares method. See the Appendix for definitions of all the variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Of the control variables, the coefficients on *Size* are significantly negative in columns (1) and (2), the coefficient on *Size* in Column (3) is negative but nonsignificant. *Size* is the logarithm of issuer's total assets at the end of the IPO year. The effect of *Size* on post-IPO performance may gradually fade out. Such results also exist in previous studies (Fan *et al.*, 2007; Liu *et al.*, 2012): for example, Liu *et al.* (2012) analyse the long-term stock performance of Chinese IPOs. In their paper, the coefficients on *Size* are significant where the dependent variables are 12/24-month adjusted buy-and-hold returns. But the coefficient on *Size* is not significant where the dependent variable is 36-month adjusted buy-and-hold return. The coefficients on *Reputation* are positive and highly significant where the dependent variables are one-year and two-year *BHAR*. The coefficient is nonsignificant where the dependent variable is three-year *BHAR*. Generally, the market share of the underwriter is changing every year, and the longer the window period of buy-and-hold abnormal returns, the more noises will affect the market performance after listing. So, the effect of the reputation of the underwriter on the long-run post-IPO performance may gradually fade out. The coefficients on *Roe* are significantly positive, which indicates that firms with high profitability achieve better long-term stock performance. The coefficients on *Sales_Growth* in columns (1) to (3) are 0.385, 0.642, and 1.077. They are significant at the 1% level and consistent with those of Fan *et al.* (2007). The coefficients on *Political* are positive and statistically significant where the dependent variables are one-year and two-year *BHAR*. These results are consistent with those of Tian and Zhang (2013); they find that political connections bring about positive returns in the long run after listing in China.

V. Social Connections and the Other IPO Outcomes

In our main test, the value of social connections among investment bankers and issuer executives is based on IPO underpricing and post-IPO stock performance. The development of the hypotheses indicates that such social connections could have an impact on the behaviour of an IPO firm, including the amount of funds raised and the efficiency of investment projects of raising money through public offering. In this section, we report and discuss the regression analyses to test the effect of social connections on the over-funding ratio (*Overfunding*), the ratio of changing investment projects after raising money through public offering (*Change*), and the investment efficiency of firms after IPO (*Efficiency*).

5.1 Social Connections and Over-Funding of IPO Firms

The foreign mature capital market uses the registration system; the amount of funds raised need not be approved in advance, and there is no strict sense of over-funding. The phenomenon of over-funding shows investors' expectations of the value creation of listed companies. In Table 5, the dependent variable is *Overfunding*, measured as amount of funds raised beyond the plan divided by total raised funds. Column (1) shows the regression result

without adding any control variables. The coefficient of *Ties_IE* is 0.065 and significant at the 1% level (t-value = 2.74). Column (2) provides the regression result after adding the control variables of firm-related characteristics and underwriter-related and auditor-related characteristics. The coefficient of *Ties_IE* is 0.056 and significant at the 1% level (t-value = 2.58). Column (3) shows the regression result after adding all the control variables. The coefficient of *Ties_IE* is 0.031 and significant at the 10% level (t-value = 1.90). The regression results reported in Table 5 suggest that socially connected investment bankers can help firms raise more money through public offerings.

Table 5 The Effect of Social Connections on *Overfunding*

	(1)	(2)	(3)
	<i>Overfunding</i>	<i>Overfunding</i>	<i>Overfunding</i>
<i>Intercept</i>	0.292*** (29.68)	-0.149 (-0.80)	0.274* (1.75)
<i>Ties_IE</i>	0.065*** (2.74)	0.056*** (2.58)	0.031* (1.90)
<i>Size</i>		0.036*** (3.53)	-0.006 (-0.74)
<i>Lev</i>		-0.514*** (-9.03)	-0.181*** (-3.75)
<i>Sales_Growth</i>		0.064** (2.15)	0.151*** (6.36)
<i>Lshare</i>		-0.001*** (-2.58)	-0.001* (-1.90)
<i>Reputation</i>		0.288 (1.56)	0.274* (1.94)
<i>Big4</i>		-0.271*** (-5.85)	-0.153*** (-4.23)
<i>Top10</i>		0.031* (1.90)	-0.016 (-1.21)
<i>SOE</i>		-0.197*** (-9.05)	-0.055*** (-2.89)
<i>Political</i>		0.065*** (4.00)	0.027** (2.16)
<i>Pricing_regime1</i>			0.046 (0.75)
<i>Pricing_regime1</i>			0.205*** (6.55)
<i>Industry</i>	No	No	Yes
<i>Year</i>	No	No	Yes
<i>Observations</i>	1,232	1,232	1,232
<i>R-squared</i>	0.006	0.208	0.559

The dependent variable in Table 5 is *Overfunding*, measured as the amount of funds raised beyond the plan divided by total raised funds. This table presents the regression results estimated by the ordinary least squares method. See the Appendix for definitions of all the variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

5.2 Social Connections and the Rate of Changing Investment Projects after IPO

The capital markets outside China do not impose mandatory requirements on the use of funds raised through public offerings, nor do they require disclosure. China's unique issuance system requires IPO companies to disclose details of their investments in the prospectus, such as the name of the investment project, the duration of the investment, and the amount of investment. Therefore, through the hand collection of the prospectuses and the use of information in the annual reports after the IPOs, we study the ratio of changing investment projects after raising money through a public offering.

Table 6 The Effect of Social Connections on *Change*

	(1) <i>Change</i> <i>T+1</i>	(2) <i>Change</i> <i>T+1 to T+2</i>	(3) <i>Change</i> <i>T+1 to T+3</i>
<i>Intercept</i>	0.034 (0.86)	0.060* (1.95)	0.081*** (3.01)
<i>Ties_IE</i>	-0.010*** (-2.75)	-0.007** (-2.18)	-0.005* (-1.77)
<i>Size</i>	-0.001 (-0.36)	-0.002 (-1.36)	-0.003** (-2.42)
<i>Lev</i>	0.031** (2.21)	0.028*** (2.72)	0.024*** (2.71)
<i>SOE</i>	-0.002 (-0.46)	-0.003 (-0.96)	-0.004 (-1.35)
<i>Idlefund</i>	0.002 (0.13)	0.006 (0.74)	0.011 (1.41)
<i>RoalIND</i>	-0.439* (-1.85)	-0.277 (-1.54)	-0.065 (-0.43)
<i>ReturnIND</i>	-0.000 (-0.01)	0.003 (0.32)	-0.003 (-0.32)
<i>Political</i>	-0.002 (-0.68)	-0.001 (-0.49)	-0.001 (-0.74)
<i>Pricing_regime1</i>	0.004 (0.40)	-0.002 (-0.13)	-0.000 (-0.02)
<i>Pricing_regime1</i>	0.053*** (6.96)	0.002 (0.13)	0.002 (0.16)
<i>Industry</i>	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes
<i>Observations</i>	1,232	2,464	3,696
<i>R-squared</i>	0.122	0.130	0.120

This table shows the regression results of the change of fundraising after IPO. The regression increases the following control variables: *Idlefund*, *RoalIND*, and *ReturnIND*. Specifically, *Idlefund* is the IPO firms' idle money, measured as total cash divided by total assets at the end of the year; *RoalIND* is the industry median of return on assets at the end of year; and *ReturnIND* is the industry median of annual return on stock. See the Appendix for definitions of the other variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

First, we collect all the projects of the IPO firms in the sample period from their prospectuses. Second, through the annual report, we track and collect the progress of the investment projects, such as the level of completion, the amount of raised capital invested, the amount of raised capital that has been changed, and so on. Finally, we calculated the percentage change of the funds after the IPOs. The ratio of changing investment projects is called *Change*.

Table 6 presents the results of OLS regressions using the one-, two-, and three-year *Change* as dependent variables. Following Zhang and Zhai (2005) and Ma and Cao (2011), the regression adds the following control variables: *Idlefund*, *Roaind*, and *Returnind*. Specifically, *Idlefund* is the IPO firms' idle money, measured as total cash divided by total assets at the end of the year; *Roaind* is the industry median of return on assets at the end of year; and *Returnind* is the industry median of annual return on stock.

Column (1) of Table 6 shows the regression results of the change of fundraising in the first fiscal year after the IPOs ($T+1$). Column (2) shows the regression results of the change of fundraising in the first fiscal year to the second fiscal year after the IPOs ($T+1, T+2$). Column (3) then shows the regression results of the change of fundraising in the first fiscal year to the third fiscal year after the IPOs ($T+1, T+2, T+3$).

The coefficients on *Ties_IE* are significantly negative in three columns of Table 6, suggesting that IPO firms with connected investment bankers had a reasonable arrangement for raising funds and that the rate of changing projects after listing is relatively low.

5.3 Social Connections and Investment Efficiency after IPO

Following Richardson (2006), we use Eq. (3) to estimate investment efficiency of firms after IPO:

$$\begin{aligned} Invest_t = & \beta_0 + \beta_1 Tobinq_{t-1} + \beta_2 Lev_{t-1} + \beta_3 Cash_{t-1} + \beta_4 Age_{t-1} + \beta_5 Size_{t-1} \\ & + \beta_6 Return_{t-1} + \beta_7 Invest_{t-1} + \sum Industry + \sum Year + \varepsilon \end{aligned} \quad (3)$$

Invest measures new investments of the firms, calculated as (capital expenditure – income of selling long-term assets – depreciation) / total asset. *Tobinq* is computed as the sum of the book value of total debts and market value of shareholder equity, divided by the book value of total assets. *Lev* is computed as total liabilities divided by total assets at the end of the year. *Cash* is computed as cash plus cash equivalents, divided by total assets at the end of the year. *Size* is the natural logarithm of year-end total assets. *Return* is the annual stock return. The absolute value of residuals estimated by Eq. (3) is used to measure investment efficiency (*Efficiency*). The greater the value, the lower the investment efficiency, and vice versa.

The control variables in Table 7 include variables already involved in the main test as well as the following variables: *Dual* (equals one if the chairman and CEO are the same person), *Dividend* (total cash dividend divided by total assets at the end of the year), *Dirnum*

(the number of board members), and *OutDir* (number of independent directors divided by number of board members).

Column (1) of Table 7 presents the results of OLS regressions using *Efficiency* within one year after IPO as the dependent variable ($T+1$). The dependent variable in Column (2) is the *Efficiency* within one year and two years after IPOs ($T+1$, $T+2$). In addition, the dependent variable in Column (3) is the *Efficiency* within one year, two years, and three years after IPOs ($T+1$, $T+2$, $T+3$). The regression results in Table 7 show that the coefficients on *Ties_IE* are significantly negative, suggesting that the investment efficiency of relationship-based companies is much higher.

Table 7 The Effect of Social Connections on Investment Efficiency

	(1) <i>Efficiency</i> $T+1$	(2) <i>Efficiency</i> $T+1$ to $T+2$	(3) <i>Efficiency</i> $T+1$ to $T+3$
<i>Intercept</i>	0.070*** (4.12)	0.065*** (5.82)	0.063*** (6.98)
<i>Ties_IE</i>	-0.005* (-1.72)	-0.006*** (-2.90)	-0.004** (-2.55)
<i>Dual</i>	0.001 (0.20)	0.001 (0.59)	0.001 (0.86)
<i>Lev</i>	-0.017** (-2.07)	-0.010* (-1.92)	-0.011*** (-2.75)
<i>SOE</i>	-0.005 (-1.36)	-0.005** (-2.06)	-0.004** (-2.17)
<i>Lshare</i>	-0.000 (-0.91)	-0.000 (-0.63)	-0.000 (-0.16)
<i>Dividend</i>	-0.010** (-2.24)	-0.006** (-2.24)	-0.005** (-2.41)
<i>Dirnum</i>	-0.000 (-0.43)	-0.000 (-0.69)	-0.000 (-0.27)
<i>Outdir</i>	0.015 (0.61)	0.002 (0.10)	0.005 (0.42)
<i>Political</i>	-0.002 (-1.01)	-0.000 (-0.08)	0.001 (0.46)
<i>Pricing_regime1</i>	-0.006 (-0.88)	0.004 (0.40)	0.000 (0.09)
<i>Pricing_regime2</i>	-0.022*** (-4.03)	0.014 (1.23)	0.003 (0.61)
<i>Industry</i>	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes
<i>N</i>	1,098	2,196	3,294
<i>R-squared</i>	0.073	0.063	0.060

This table shows the regression results of investment efficiency after IPOs. We control for the variables already involved in the main test as well as the following variables: *Dual* (equals one if the chairman and CEO are the same person), *Dividend* (total cash dividend divided by total assets at the end of the year), *Dirnum* (the number of board members), *OutDir* (the number of independent directors divided by the number of board members). See the Appendix for definitions of the other variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Of the control variables, the results in columns (1) to (3) of Table 7 show that the coefficients on *Lev* are -0.017, -0.010, and -0.011 and significant at the 5%, 10%, and 1% levels, respectively. These results are consistent with those of Chen *et al.* (2011). The coefficients on *SOE* are significantly negative in columns (2) and (3), suggesting that the investment efficiency of non-SOEs is significantly lower than that of SOEs in China, and consistent with those of Yu *et al.* (2014).

VI. Additional Analyses

6.1 The Potential Endogeneity of Connections

In the main test, we employ a regression analysis by including observable variables that affect IPO underpricing/post-IPO performance. However, the effect may be caused by other variables (i.e. high-quality firms are more likely to hire executives from top universities, while investment bankers are usually all graduates of top universities). We adopt a propensity score matching (PSM) approach to address this endogeneity issue. We build a propensity score model using a logit regression that estimates the presence of IEs' connections. The dependent variable is *Ties_IE*. We use all the independent variables that are described in Eq. (1) and Eq. (2) as the independent variables of our logit model. We then use nearest-neighbour matching to match each of the 211 observations from the treatment group with the one with the closest propensity score from the control group. This procedure results in 422 observations (211 pairs).

Table 8 reports the estimates for Eq. (1) and Eq. (2) using the PSM sample. The dependent variable in Column (1) is *Underpricing*. The dependent variables in columns (2) to (4) are *BHAR_1year*, *BHAR_2year*, and *BHAR_3year*, respectively. The coefficient of *Ties_IE* in Column (1) is -0.123 and significant at the 5% level (t-stat. = -2.49). The results in Column (3) and Column (4) of Table 8 show that the coefficient on *Ties_IE* is 0.108 (0.376) and significant at the 5% (1%) level. The results in Table 8 show that IEs' connections are negatively related with IPO underpricing and that firms with IEs' connections outperform those without IEs' connections based on one-year/two-year/three-year post-IPO stock returns. These results support hypotheses 1 and 2.

6.2 Cross-Sectional Analyses

To obtain more insight into the effect of social connections on IPO underpricing and post-IPO performance, we next investigate whether these effects vary by different subsamples.

First, the financial environment in the area of the IPO firms can influence the behaviour of the firms (Zhu *et al.*, 2010). In China's history of IPOs, there are cases in which the number of inquiries has been less than 20 and the companies have suspended the process of raising new shares. For example, Nanning Baling Technology Co., Ltd.

Table 8 PSM Sample

	(1)	(2)	(3)	(4)
	<i>Underpricing</i>	<i>BHAR 1year</i>	<i>BHAR 2year</i>	<i>BHAR 3year</i>
<i>Intercept</i>	2.183*** (3.39)	0.227 (0.47)	-0.329 (-0.48)	-0.707 (-0.42)
<i>Ties_IE</i>	-0.123** (-2.49)	0.025 (0.69)	0.108** (2.04)	0.376*** (2.92)
<i>Size</i>	-0.067** (-2.10)	-0.044* (-1.85)	-0.028 (-0.80)	-0.024 (-0.29)
<i>Lev</i>	0.093 (0.54)	0.056 (0.43)	-0.027 (-0.14)	-0.125 (-0.28)
<i>Roe</i>		4.211*** (7.08)	4.225*** (4.93)	6.021*** (2.89)
<i>Sales_Growth</i>	-0.050 (-0.57)	0.346*** (4.95)	0.624*** (6.19)	0.876*** (3.57)
<i>Lshare</i>	-0.003 (-1.64)	-0.001 (-0.82)	0.003 (1.40)	0.009** (2.08)
<i>Reputation</i>	-1.144** (-2.41)	0.373 (1.06)	-0.123 (-0.24)	-0.734 (-0.59)
<i>Big4</i>	0.143 (1.21)	0.116 (1.32)	0.018 (0.15)	-0.144 (-0.47)
<i>Top10</i>	0.016 (0.31)	0.009 (0.23)	-0.043 (-0.77)	0.118 (0.88)
<i>SOE</i>	0.179** (2.18)	0.091 (1.48)	0.137 (1.56)	0.323 (1.51)
<i>Political</i>	-0.070 (-1.47)	0.039 (1.08)	0.050 (0.97)	0.098 (0.79)
<i>Pricing_regime1</i>	-0.281 (-1.03)	-0.496** (-2.44)	-1.232*** (-4.20)	-2.542*** (-3.56)
<i>Pricing_regime2</i>	-0.027 (-0.20)	0.075 (0.75)	0.015 (0.10)	-0.341 (-0.97)
<i>Industry</i>	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes
<i>Observations</i>	422	422	422	422
<i>R-squared</i>	0.476	0.323	0.306	0.207

This table presents the regression results estimated by the ordinary least squares method. See the Appendix for definitions of all the variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

announced that only 19 inquiries had been made to provide an effective offer, and the IPO process was then suspended. In 2012, Longma Information & Technology Co., Ltd. was forced to suspend its IPO process because only 18 institutions were involved in the inquiry. Media and financial practitioners believe that part of the reason for the suspension is that the financial environment in their region is less developed, making it more difficult to attract the attention of institutional investors.

Table 9 Cross-Sectional Analyses

	Finenv=0			Finenv=1			SOEs			Non-SOEs		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
<i>Intercept</i>	Underpricing 2.826*** (5.02)	BHAR_3year 0.539 (0.47)	Underpricing 2.682*** (4.88)	BHAR_3year -2.853*** (-2.23)	Underpricing 3.252*** (3.87)	BHAR_3year -2.297 (-1.44)	Underpricing 2.869*** (6.14)	BHAR_3year -0.568 (-0.53)	Underpricing 2.869*** (6.14)	BHAR_3year -0.568 (-0.53)	BHAR_3year -0.568 (-0.53)	
<i>Ties_IE</i>	-0.145** (-2.53)	0.330*** (2.83)	-0.022 (-0.39)	0.172 (1.29)	-0.082 (-0.69)	0.096 (0.43)	-0.097** (-2.32)	0.289*** (3.00)	-0.097** (-2.32)	0.289*** (3.00)	0.289*** (3.00)	
<i>Size</i>	-0.096*** (-3.34)	-0.072 (-1.19)	-0.113*** (-3.82)	0.047 (0.68)	-0.109** (-2.46)	-0.008 (-0.09)	-0.118*** (-4.83)	-0.042 (-0.73)	-0.109** (-2.46)	-0.008 (-0.09)	-0.118*** (-4.83)	
<i>Lev</i>	0.000 (0.00)	-0.144 (-0.41)	0.348** (2.10)	0.205 (0.53)	0.128 (0.41)	1.368** (2.33)	0.148 (1.14)	-0.098 (-0.33)	1.368** (2.33)	0.148 (1.14)	-0.098 (-0.33)	
<i>Roe</i>		4.140*** (2.82)		5.576*** (3.53)		3.187 (1.49)		5.734*** (4.44)	3.187 (1.49)		5.734*** (4.44)	
<i>Sales_Growth</i>	-0.027 (-0.33)	0.829*** (5.19)	-0.046 (-0.56)	1.354*** (7.60)	0.135 (0.76)	1.065*** (3.58)	-0.033 (-0.56)	1.032*** (7.82)	1.065*** (3.58)	-0.033 (-0.56)	1.032*** (7.82)	
<i>Lshare</i>	0.003 (1.64)	0.005 (1.52)	-0.000 (-0.07)	0.002 (0.48)	-0.003 (-1.21)	0.008 (1.43)	0.003** (2.31)	0.001 (0.29)	0.008 (1.43)	0.003** (2.31)	0.001 (0.29)	
<i>Reputation</i>	-0.988** (-2.08)	1.098 (1.14)	-1.667** (-2.00)	-1.677 (-0.87)	-0.718 (-1.17)	-0.182 (-0.15)	-0.929* (-1.90)	-0.622 (-0.56)	-0.718 (-1.17)	-0.929* (-1.90)	-0.622 (-0.56)	
<i>Big4</i>	0.359*** (2.82)	-0.404 (-1.55)	0.079 (0.60)	-0.066 (-0.22)	0.187 (1.03)	-0.304 (-0.87)	0.224** (2.07)	-0.119 (-0.48)	0.187 (1.03)	0.224** (2.07)	-0.119 (-0.48)	
<i>Top10</i>	-0.034 (-0.73)	0.126 (1.33)	0.011 (0.25)	-0.005 (-0.05)	-0.073 (-0.78)	-0.214 (-1.21)	-0.002 (-0.05)	0.118 (1.58)	-0.073 (-0.78)	-0.214 (-1.21)	0.118 (1.58)	
<i>SOE</i>	0.134* (1.96)	-0.061 (-0.43)	0.119* (1.88)	0.075 (0.51)								
<i>Political</i>	-0.081* (-1.82)	0.138 (1.50)	-0.038 (-0.90)	-0.062 (-0.63)	-0.061 (-0.68)	-0.056 (-0.32)	-0.065** (-2.03)	0.100 (1.37)	-0.061 (-0.68)	-0.056 (-0.32)	-0.065** (-2.03)	
<i>Pricing_regime1</i>	-0.369 (-1.40)	-3.318*** (-6.15)	0.603*** (5.05)	0.724** (2.58)	0.372** (2.10)	0.584* (1.71)	0.346*** (2.98)	-0.799*** (-2.99)	0.372** (2.10)	0.584* (1.71)	0.346*** (2.98)	
<i>Pricing_regime2</i>	-0.331** (-2.32)	-0.230 (-0.79)	-0.142 (-1.36)	0.285 (1.18)	-0.322* (-1.65)	0.536 (1.47)	-0.312*** (-3.42)	0.334 (1.59)	-0.322* (-1.65)	0.536 (1.47)	-0.312*** (-3.42)	
<i>Industry</i>	Yes 612	Yes 612	Yes 620	Yes 620	Yes 246	Yes 246	Yes 986	Yes 986	Yes 246	Yes 246	Yes 986	
<i>R-squared</i>	0.509	0.231	0.525	0.211	0.438	0.352	0.525	0.173	0.438	0.352	0.173	

This table reruns the regressions of Eq. (1) and (2) for the two subsamples. *Finenv* equals one if the index of financial environment in the area where the IPO firm is located is no less than the median index of the total sample and zero otherwise. See the Appendix for definitions of the other variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

On the basis of the above cases, we carry out cross-sectional tests according to the financial environment in the area where the firm is located. We use the *Regional Financial Market Index* in Wang *et al.* (2016) as a measure of the financial environment. Specifically, *Finenv* equals one if the index of the financial environment in the province/municipality where the IPO firm is located is no less than the median index of the total sample and zero otherwise.

We then partition the sample into two subsamples, one including all IPO firms for which *Finenv* equals one and the other containing all IPO firms for which *Finenv* equals zero. We rerun the regression of Eq. (1) and Eq. (2) for the two subsamples, respectively. Columns (1) to (4) of Table 9 show the regression results. The coefficients on *Ties_IE* are significant in the subsample of IPO firms with *Finenv* equalling zero, suggesting that the effect of connected investment bankers is more obvious in areas with a less developed financial environment.

Second, Chen *et al.* (2013) argue that compared with non-SOEs, SOEs enjoy favourable access to valuable information about the policy process. SOEs are often provided with preferential financial treatment. With the government's support, SOEs often enjoy favourable access to bank loans (Brandt and Li, 2003) and lower costs of capital (Borisova and Megginson, 2011). On the basis of this line of the literature, we predict that the effect of social connections between investment bankers and executives on IPO underpricing and post-IPO performance could be mitigated in SOEs.

We also partition the total sample into two subsamples, one including all SOEs and the other including all non-SOEs. We rerun the regression of Eq. (1) and Eq. (2) for the two subsamples, respectively. Columns (5) to (8) of Table 9 show the regression results. The coefficients on *Ties_IE* are significant in the subsample of IPOs that includes all non-SOEs, suggesting that the effect of connected investment bankers is more obvious in non-SOEs.

This evidence is consistent with our conjecture above and provides further support for the effect of social connections among investment bankers and executives.

6.3 Subsamples to Conduct Robustness Test

It is well known that not all executives are equally important in the IPO process. The most important executives tend to be the chairman and CEO. Therefore, the robustness analysis we adopt limits the scope of executives to the level of chairman and CEO, including the chairman, the CEO, and the deputies in those positions. The social connection indicators are recalculated according to the above method. Specifically, *Ties_Top* equals one if the issuer *i*'s chairman (deputy) and/or CEO (deputy) has a common alma mater with either of the signing investment bankers and zero otherwise.

In the main test, *Ties_IE* equals one if any of the issuer's top executives has a common alma mater with either of the signing investment bankers. This variable indicates whether any of them attended the same universities, regardless of having attended the same school in

Table 10 Subsamples to Conduct Robustness Test

	(1)	(2)	(3)	(4)
	<i>Underpricing</i>	<i>BHAR 3year</i>	<i>Underpricing</i>	<i>BHAR 3year</i>
<i>Intercept</i>	2.889*** (7.61)	-1.265 (-1.52)	2.887*** (7.59)	-1.240 (-1.49)
<i>Ties_Top</i>	-0.104** (-2.17)	0.217** (2.07)		
<i>Ties_Gap4</i>			-0.095* (-1.81)	0.223* (1.93)
<i>Size</i>	-0.114*** (-5.67)	-0.016 (-0.35)	-0.114*** (-5.66)	-0.017 (-0.37)
<i>Lev</i>	0.183 (1.57)	0.115 (0.45)	0.195* (1.67)	0.091 (0.36)
<i>Roe</i>		4.925*** (4.65)		4.942*** (4.66)
<i>Sales_Growth</i>	-0.029 (-0.50)	1.089*** (9.20)	-0.032 (-0.56)	1.088*** (9.19)
<i>Lshare</i>	0.001 (1.30)	0.003 (1.14)	0.001 (1.30)	0.003 (1.14)
<i>Reputation</i>	-0.926*** (-2.70)	-0.032 (-0.04)	-0.920*** (-2.68)	-0.051 (-0.07)
<i>Big4</i>	0.220** (2.51)	-0.162 (-0.85)	0.221** (2.51)	-0.167 (-0.87)
<i>Top10</i>	-0.014 (-0.44)	0.060 (0.88)	-0.014 (-0.44)	0.060 (0.88)
<i>SOE</i>	0.120*** (2.61)	0.026 (0.26)	0.119*** (2.58)	0.028 (0.28)
<i>Political</i>	-0.062** (-2.03)	0.059 (0.89)	-0.062** (-2.03)	0.058 (0.88)
<i>Pricing_regime1</i>	-0.221 (-1.48)	-2.052*** (-6.28)	-0.218 (-1.46)	-2.057*** (-6.29)
<i>Pricing_regime2</i>	-0.292*** (-3.85)	0.379** (2.27)	-0.293*** (-3.85)	0.380** (2.27)
<i>Industry</i>	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes
<i>Observations</i>	1,232	1,232	1,232	1,232
<i>R-squared</i>	0.502	0.189	0.501	0.189

This table reruns Eq. (1) and Eq. (2) using alternative indicators of social connections. *Ties_Top* equals one if the issuer *i*'s chairman (deputy) or CEO (deputy) has a common alma mater with any of the signing investment bankers and zero otherwise. *Ties_Gap4* equals one if an investment banker and an executive graduated from the same university and the age difference between the two is no more than four years and zero otherwise. See the Appendix for definitions of the other variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

the same periods. This may raise some problems since the two sides with an alumni relationship may not know each other. In response to this concern, we add a constraint to the measurement of social connections, that is, the age gap between the two sides cannot be

more than four years. Specifically, *Ties_Gap4* equals one if an investment banker and an executive graduated from the same university and the age gap between the two is no more than four years and zero otherwise.

Ties_Top/Ties_Gap4 denotes the cases where *Ties_IE* = 1 and the observation possesses an attribute of interest such that the effects of social connections are still expected to exist. We use these subsamples to re-examine Eq. (1) and Eq. (2). The coefficients on *Ties_Top* and *Ties_Gap4* are significant. Overall, the results in Table 10 still support the hypotheses.

6.4 Accounting Performance

We use the change in accounting performance (ΔRoe) as the measure of post-IPO accounting performance and rerun the regression of Eq. (2). ΔRoe is the change in returns

Table 11 The Effect of Social Connections on Accounting Performance (ΔRoe)

	(1) ΔRoe <i>T+1</i>	(2) ΔRoe <i>T+1 to T+2</i>	(3) ΔRoe <i>T+1 to T+3</i>
<i>Intercept</i>	-0.000 (-0.02)	0.026 (1.00)	0.012 (0.54)
<i>Ties_IE</i>	0.006** (2.10)	0.005** (1.99)	0.004* (1.91)
<i>Size</i>	-0.001 (-0.48)	-0.002 (-1.63)	-0.002 (-1.31)
<i>Lev</i>	-0.051*** (-6.58)	-0.024*** (-3.76)	-0.018*** (-3.31)
<i>Sales_Growth</i>	0.078*** (21.25)	0.030*** (15.33)	0.013*** (11.47)
<i>Lshare</i>	0.000 (0.47)	0.000 (1.37)	0.000 (0.91)
<i>Reputation</i>	-0.003 (-0.13)	-0.008 (-0.40)	0.017 (0.92)
<i>Big4</i>	-0.003 (-0.39)	-0.001 (-0.19)	-0.005 (-0.83)
<i>Top10</i>	0.004 (1.61)	0.000 (0.02)	0.001 (0.26)
<i>SOE</i>	0.001 (0.23)	0.002 (0.58)	0.003 (1.23)
<i>Political</i>	0.004** (2.02)	0.003* (1.74)	0.002 (1.43)
<i>Pricing_regime1</i>	0.009 (1.59)	-0.012 (-1.02)	0.005 (0.75)
<i>Pricing_regime2</i>	-0.006 (-1.24)	-0.009 (-0.64)	0.016** (2.07)
<i>Industry</i>	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes
<i>Observations</i>	1,232	2,464	3,696
<i>R-squared</i>	0.361	0.149	0.077

This table uses the change in accounting performance (ΔRoe) as the measure of post-IPO performance and reruns the regression of Eq. (2). ΔRoe is the change in returns on equity, computed as year-end returns on equity minus the previous year-end returns on equity. See the Appendix for definitions of the other variables. The superscripts ***, **, and * indicate two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

on equity, computed as year-end returns on equity minus last-year-end returns on equity. Table 11 presents the results of the OLS regressions. The dependent variable in Column (1) is ΔRoe for one year after the IPO ($T+1$) and so on. Column (3) shows the regression results of ΔRoe for one to three years after the IPO ($T+1$, $T+2$, $T+3$). In the three regressions, the coefficients on *Ties_IE* are positive and significant, which means that the accounting performance of the issuers with connected investment bankers is better after the IPOs.

VII. Conclusion

The Chinese IPO system is undergoing continual reform; thus, the study of related issues remains popular in the academic community. Proceeding from China's unique relationship-based society, this paper uses the literature in the field of social connections for reference and examines whether relationship-based financial intermediaries hired by an issuer exert an influence on IPO underpricing and post-IPO long-term market performance. The empirical results show that if there are social connections between an investment banker and the executives of an IPO company, then the IPO underpricing of that company will be lower and its market performance within three years of the IPO will be better. Furthermore, this paper discusses overfunding, changing investment projects after raising money through a public offering, and the post-IPO investment efficiency of companies that have hired relationship-based financial intermediaries. The study finds that a relationship-based company has a higher degree of overfunding for the IPO, the rate of changing investment projects is lower within three years of the listing date, and investment efficiency is higher within three years of the IPO. Additionally, the cross-sectional analyses show that the role of the relationship-based investment banker is more obvious in areas with a poor financial environment and in non-SOEs. Finally, the additional analyses still support the hypotheses of this paper.

On the whole, this study provides a helpful supplement to the literature in the field of IPOs and social connections and expands the study of the investment banker mechanism by using a Chinese institutional background. In addition, the conclusions of this paper, to a certain degree, provide referential value for the reform of the IPO system. Sponsors of foreign exchanges are all institutions, and they do not designate a specific person as being in charge. The large-sample empirical results show that relationship-based financial intermediaries can influence the efficiency of IPO resource allocation. Small and medium-sized investors can acquire incremental information about future performance from social connections between investment bankers and executives. For policy makers, the research results of this paper provide a clear understanding of the influences of social connections in IPO and post-IPO performance and may be revealing for the Chinese reform of the IPO system. In cases in which corporate performance frequently meets a "sudden downturn" after the IPO, strengthening the information disclosure of executives and

managing workers of financial intermediaries may be a feasible approach to preventing such events.

“Open Access. This article is distributed under the terms of the Creative Commons Attribution License which permits any use, distribution, and reproduction in any medium, provided the original author(s) and the source are credited.”

References

- Beatty, R.P. and Welch, I. (1996), ‘Issuer Expenses and Legal Liability in Initial Public Offerings’, *Journal of Law and Economics* 39 (2): 545-602.
- Benveniste, L. M. and Spindt, P. A. (1989), ‘How investment bankers determine the offer price and allocation of new issues’, *Journal of Financial Economics* 24 (2): 343-361.
- Benveniste, L. M. and Wilhelm, W. J. (1990), ‘A comparative analysis of IPO proceeds under alternative regulatory environments’, *Journal of Financial Economics* 28 (1-2): 173-207.
- Bertomeu, J. and Marinovic, I. (2016), ‘A Theory of Hard and Soft Information’, *The Accounting Review* 91 (1): 1-20.
- Booth, J. R. and Smith, R. L. (1986), ‘Capital Raising, Underwriting and the Certification Hypothesis’, *Journal of Financial Economics* 15 (1): 261-281.
- Borisova, G. and Megginson, W. L. (2011), ‘Does Government Ownership Affect the Cost of Debt? Evidence from Privatization’, *Review of Financial Studies* 24 (8): 2693-2737.
- Brandt, L. and Li, H. B. (2003), ‘Bank Discrimination in Transition Economies: Ideology, Information, or Incentives’, *Journal of Comparative Economics* 31 (3): 387-413.
- Cai, Y., Walkling, R. A., and Yang, K. (2016), ‘The Price of Street Friends: Social Networks, Informed Trading, and Shareholder Costs’, *Journal of Financial and Quantitative Analysis* 51 (3): 801-837.
- Chahine, S. and Goergen, M. (2013), ‘The Effects of Management-Board Ties on IPO Performance’, *Journal of Corporate Finance* 21 (1): 153-179.
- Chahine, S. and Goergen, M. (2014), ‘Top Management Ties with Board Members: How They Affect Pay-Performance Sensitivity and IPO Performance’, *Journal of Corporate Finance* 27: 99-115.
- Chemmanur, T. J. and Fulghieri, P. (1994), ‘Investment Bank Reputation, Information Production, and Financial Intermediation’, *Journal of Finance* 49 (1): 57-79.
- Chemmanur, T. J., Hu, G., and Huang, J. (2010), ‘The Role of Institutional Investors in Initial Public Offerings’, *The Review of Financial Studies* 23 (12): 4496-4540.
- Chemmanur, T. J., Mine, E., and Krishnan, K. (2017), ‘Is It the Investment Bank or the Investment Banker? A Study of the Role of Investment Banker Human Capital in

- Acquisitions', *Journal of Financial and Quantitative Analysis*, forthcoming.
- Chen, J., Ke, B., Wu, D. H., and Yang, Z. F. (2016), 'The Consequences of Shifting the IPO Offer Pricing Power From Securities Regulators to Market Participants in Weak Institutional Environments: Evidence from China', *Journal of Corporate Finance*, forthcoming.
- Chen, C., Shi, H., and Xu, H. (2013), 'Underwriter Reputation, Issuer Ownership, and Pre-IPO Earnings Management: Evidence from China', *Financial Management* 42 (3): 647-677.
- Chen, S. M., Sun, Z., Tang, S., and Wu, D. H. (2011), 'Government Intervention and Investment Efficiency: Evidence from China', *Journal of Corporate Finance* 17 (2): 259-271.
- Chen, Y. S., Zheng, D. J., and Li, L. (2014), 'Minying Qiye Fashenwei Shehui Guanxi, IPO Zige yu Shangshi Hou Bianxian' (Non-SOE IPO Firms' Relationship with Stock Issuance Examination and Verification Committee, IPO Verification and Future Performance), *Accounting Research*, Issue 2: 12-19.
- Cohen, L., Frazzini, A., and Malloy, C. (2008), 'The Small World of Investing: Board Connections and Mutual Fund Returns', *Journal of Political Economy* 116 (5): 951-979.
- Cooney, J. W., Madureira, L., Singh, A. K., and Yang, K. (2015), 'Social Ties and IPO Outcomes', *Journal of Corporate Finance* 33: 129-146.
- Du, X. Q. and Lai, S. J. (2017), 'Issuance Examination Committee Connections and IPO Underpricing: Evidence from China', *China Accounting and Finance Review* 19 (3): 1-41.
- Du, X. Q., Lai, S., and Du, Y. (2013), 'Fashenwei Lianxi, Qianguize yu IPO Shichang de Ziyuan Peizhi Xiaolu' (Issuance Examination Committee Connection, Hidden Rules, and Resource Allocation Efficiency of IPO Market), *Journal of Financial Research* 35 (3): 143-156.
- Engelberg, J., Gao, P., and Parson, C. A. (2012), 'Friends with Money', *Journal of Financial Economics* 103 (1): 169-188.
- Fan, J. P. H., Guan, F., Li, Z. Q., and Yang, Y. G. (2014), 'Relationship Networks and Earnings Informativeness: Evidence from Corruption Cases', *Journal of Business Finance and Accounting* 41 (7): 831-866.
- Fan, J. P. H., Wong, T. J., and Zhang, T. (2007), 'Politically Connected CEOs, Corporate Governance, and Post-IPO Performance of China's Newly Partially Privatized Firms', *Journal of Financial Economics* 84 (2): 330-357.
- Fang, L. (2005), 'Investment Bank Reputation and the Price and Quality of Underwriting Services', *Journal of Finance* 60 (6): 2729-2761.
- Francis, B., Hasan, I., and Sun, X. (2009), 'Political Connections and the Process of Going

- Public: Evidence from China', *Journal of International Money and Finance* 28 (4): 696-719.
- Goldstein, A., Irvine, P., and Puckett, A. (2011), 'Purchasing IPOs with Commissions', *Journal of Financial and Quantitative Analysis* 46 (5): 1193-1225.
- Granovetter, M. (1985), 'Economic Action and Social Structure: The Problem of Embeddedness', *American Journal of Sociology* 91 (3): 481-510.
- Granovetter, M. (2005), 'The Impact of Social Structure on Economic Outcomes', *Journal of Economic Perspectives* 19 (1): 33-50.
- Guan, Y., Su, L., Wu, D., and Yang, Z. (2016) 'Do School Ties between Auditors and Client Executives Influence Audit Outcomes', *Journal of Accounting and Economics* 61 (3): 506-523.
- Gul, F., Wu, D. H., and Yang, Z. F. (2013), 'Do Individual Auditors Affect Audit Quality Evidence from Archival Data', *The Accounting Review* 88 (6): 1993-2023.
- Guo, H. and Zhao, Z. Y. (2006), 'Chengxiaoshang Shengyu dui IPO Gongsi Dingjia, Chushi he Changqi Huibao Yingxiang Shizheng Yanjiu' (An Empirical Research on the Influence of Underwriter Reputation on IPO Firm Pricing, Initial and Long-run Returns', *Management World* 22 (3): 122-128.
- Hu, D. and Feng, Q. G. (2013), 'Xinxi Huanjing, Shenji Zhiliang yu IPO Yijia—Yi A Gu Shichang 2009-2011 Nian Shangshi de Gongsi Wei Li' (Information Environment, Audit Quality and IPO Underpricing: Based on the A-share IPO Firms during 2009-2011), *Accounting Research*, Issue 2: 78-85.
- Li, Z. Q. (2017), 'Guanxixing de Kuaiji Zhili—Guanyu Zhongguo Kuaiji Yanjiu Guojihua de Fanshi Tanxi' (The Governance Role of Accounting in Relationship-based Transactions: Paradigm Exploration of Internationalized China's Accounting Research), *Journal of Finance and Economics* 43 (2): 4-33.
- Liu, J. L., Uchida, K., and Gao, R. D. (2012), 'Political Connections and the Long-term Stock Performance of Chinese IPOs', *Journal of International Financial Markets, Institutions & Money* 22 (4): 814-833.
- Luo, W., Yue, H., and Zhang, L. (2015). 'Friends Can Help: The Effects of Relationships in the Chinese Book-building Process', Unpublished Working Paper, Peking University.
- Ma, L. F. and Cao, C. F. (2011), 'Zhidu Huanjing, Difang Zhengfu Ganyu, Gongsi Zhili yu IPO Muji Zijin Touxiang Biangeng' (The Institutional Environment, the Intervention of Local Governments, the Corporate Governance and the Change in the Direction in which the Collected Fund Obtained through IPO is Put', *Management World* 27 (5): 127-148.
- Meng, J. G., Zhang, W. and Zou, G. F. (2016), 'Deliberate IPO Underpricing or Market Misvaluation? New Evidence from China', *China Accounting and Finance Review* 18 (4): 75-97.

- Nimalendran, M., Ritter, J. R., and Zhang, D. H. (2007), 'Do Today's Trades Affect Tomorrow's IPO Allocations', *Journal of Financial Economics* 84 (1): 87-109
- Nooteboom, B. (2002), *Trust: Forms, Foundations, Functions, Failures and Figures*, Cheltenham UK: Edward Elgar.
- Rauch, J. E. (2001), 'Business and Social Networks in International Trade', *Journal of Economic Literature* 39 (4): 1177-1203.
- Reuter, J. (2006), 'Are IPO Allocations for Sale? Evidence from Mutual Funds', *Journal of Finance* 61 (5): 2289-2324.
- Richardson, S. (2006), 'Over-investment of Free Cash Flow', *Review of Accounting Studies* 11 (3): 159-189.
- Schenone, C. (2004), 'The Effect of Banking Relationships on the Firm's IPO Underpricing', *The Journal of Finance* 59 (6): 2903-2958.
- Sherman, A. E. (2000), 'IPOs and Long-term Relationships: An Advantage of Book Building', *Review of Financial Studies* 13 (3): 697-714.
- Sherman, A. E. and Titman, S. (2002), 'Building the IPO Order Book: Underpricing and Participation Limits with Costly Information', *Journal of Financial Economics* 65 (1): 3-29.
- Shue, K. (2013), 'Executive Networks and Firm Policies: Evidence from the Random Assignment of MBA Peers', *Review of Financial Studies* 26 (6): 1401-1442.
- Su, D. W. (2004), 'Adverse-selection Versus Signaling: Evidence from the Pricing of Chinese IPOs', *Journal of Economics and Business* 56 (1): 1-19.
- Tian, L. H. (2011), 'Regulatory underpricing: Determinants of Chinese extreme IPO returns', *Journal of Empirical Finance* 18 (1): 78-89.
- Tian, L. H. and Zhang, W. (2013), 'Zhengzhi Guanlian Yingxiang Woguo Shangshi Gongsi Changqi Jixiao de San Da Xiaoying' (Three Effects of Political Connections on Long-term Performances of the Chinese Firms after IPOs), *Economic Research Journal*, Issue 11: 71-86.
- Titman, S. and Trueman, B. (1986), 'Information Quality and the Valuation of New Issues', *Journal of Accounting and Economics* 8 (2): 152-172.
- Wang, X. L., Fan, G., and Yu, J. W. (2016), *Zhongguo FenShengfen Shichanghua Zhishu Baogao 2016* (Marketization Index of China's Provinces: NERI Report 2016), Beijing: Social Sciences Academic Press.
- Weng, X. W., Wang, K. M., and Lu, C. J. (2014), 'Jiazu Chengyuan Canyu Guanli dui IPO Yijialu de Yingxiang' (The Influence of Family Members' Participation in Management on IPO Underpricing), *Management World*, Issue 1: 156-166.
- Wong, T. J. (2014), 'Corporate Governance Research on Listed Firms in China: Institutions, Governance and Accountability', *Foundations and Trends in Accounting* 9 (4): 259-326.

- Xu, H. P. and Luo, W. (2007), 'Touzi Yinhang Shengyu Jizhi Youxiaoxing—Zhiye Zhiliang yu Shichang Fene Shuangchong Shijiao de Yanjiu' (Reputation Effect of Investment Banks: Research from Aspects of Market Share and Service Quality), *Economic Research Journal*, Issue 2: 124-136.
- Yang, Z. F. (2013), 'Do Political Connections Add Value to Audit Firms? Evidence from IPO Audits in China', *Contemporary Accounting Research* 30 (3): 891-921.
- Yang, Z. F., Zhao, G., and Chen, D. H. (2016), 'Does Investment Banker Individual Experience Matter? Evidence from Chinese IPOs', Unpublished Working Paper, Stony Brook University.
- Yao, Y. and Zhao, M. (2016), 'Zhongguoshi Fengxian Pilu, Pilu Shuiping yu Shichang Fanying' (Chinese Styled Risk Disclosure, Disclosure Level and the Market Reaction), *Economic Research Journal*, Issue 7: 158-172.
- Yu, K., Li, Z. G., Zhang, X. R., and Xu, J. G. (2014), 'Qiye Touzi Xiaolu zhi Mi: Rongzi Yueshu Jiashuo yu Huabi Zhengce Chongji' (Investment Efficiency Puzzle: Financial Constraint Hypothesis and Monetary Policy Shock), *Economic Research Journal*, Issue 5: 106-120.
- Zhang, W. G. and Zhai, C. Y. (2005), 'Shangshi Gongsi Biangeng Muji Zijin Touxiang Dongyin Yanjiu' (On the Motive of Changing Investment Projects of Raising Money through Public Offering), *Accounting Research* 56 (7): 19-24.
- Zhu, K., Wan, H. L., and Chen, X. Y. (2010), 'Kongguquan Xingzhi, IPO yu Yinhang Xindai Ziyuan Peizhi—Jiyu Jinrong Fazhan Huanjing de Fenxi' (Controlling Shareholder, IPO and Bank Loan Decisions—Based on Regional Financial Development), *Journal of Financial Research* 31 (5): 179-190.

Appendix A Variable Definitions

Variable	Definition
<i>Underpricing</i>	Underpricing of a specific IPO firm, measured as initial return, adjusted for the market return.
<i>BHAR_1year</i>	Buy-and-hold abnormal returns over 1 year after the listing date
<i>BHAR_2year</i>	Buy-and-hold abnormal returns over 2 years after the listing date
<i>BHAR_3year</i>	Buy-and-hold abnormal returns over 3 years after the listing date
<i>Ties_IE</i>	Indicator for whether one of the issuer's top executives has a common alma mater with any of the signing investment bankers
<i>Size</i>	The natural logarithm of year-end total assets
<i>Lev</i>	Leverage ratio, measured as total liabilities divided by total assets at the end of the year
<i>Roe</i>	Net income divided by book value of year-end common shareholders' equity
<i>Sales_growth</i>	Measure of the growth potential of the issuer, defined as the current revenues divided by the prior year's sale revenues.
<i>Lshare</i>	Indicator for shareholding ratio of the largest shareholder
<i>Reputation</i>	Indicator for the reputation of the underwriter, measured as the market share of the underwriter in terms of proceeds raised in the pre-IPO year t-1 time period
<i>Big4</i>	Indicator for Big 4 auditors
<i>Top10</i>	Indicator for top 10 domestic auditors
<i>SOE</i>	Indicator for firms that are ultimately controlled by the government
<i>Political</i>	Indicator of whether the CEO hired by issuer is currently or was formerly a delegate to National People's Congress, a member of the CPPCC (Chinese People's Political Consultative Conference), or an officer of either the central government, a local government, or the military.
<i>Pricing_Regime1</i>	Equals one if the listing date of the IPO firm is between 8 December 2004 and 10 June 2009 and zero otherwise.
<i>Pricing_Regime2</i>	Equals one if the listing date of the IPO firm is between 11 June 2009 and 31 December 2012 and zero otherwise.
<i>Overfunding</i>	Over-funding ratio, which is the amount of funds raised beyond the plan divided by total raised funds
<i>Change</i>	The level of changing investment projects of raising money through public offering
<i>Idlefund</i>	Total cash divided by total assets at the end of the year
<i>RoalIND</i>	The industry median of return on assets at the end of year
<i>ReturnIND</i>	The industry median of annual return on stock
<i>Efficiency</i>	Investment efficiency of firms after IPO, estimated by the Richardson (2006) model
<i>Dual</i>	Equals one if the chairman and CEO are the same person
<i>Dividend</i>	Total cash dividend divided by total assets at the end of the year
<i>Dirnum</i>	The number of board members
<i>OutDir</i>	The number of independent directors divided by the number of board members
<i>Ties_Top</i>	Equals one if the issuer's chairman (deputy) or CEO (deputy) has a common alma mater with any of the signing investment bankers and zero otherwise
<i>Ties_Gap4</i>	Equals one if an investment banker and an executive graduated from the same university and the age difference between the two is no more than four years and zero otherwise.

Appendix B Distribution of Schools

Top 10 schools with the most connected banker-executive pairs

Rank	Schools	%
1	北京大学 (Peking University)	10.67
1	中国人民大学 (Renmin University of China)	10.67
3	清华大学 (Tsinghua University)	7.39
4	中山大学 (Sun Yat-Sen University)	7.22
5	复旦大学 (Fudan University)	6.40
6	西南财经大学 (Southwestern University of Finance and Economics)	5.42
7	武汉大学 (Wuhan University)	4.93
7	中南财经政法大学 (Zhongnan University of Economics and Law)	4.93
9	华中科技大学 (Huazhong University of Science and Technology)	4.76
10	上海财经大学 (Shanghai University of Finance and Economics)	4.27
Total		66.67