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Institutional Environment and IPO Strategy: A Study of ChiNext in China

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ABSTRACT Taking an institution-based view, we investigate how entrepreneurs respond to immature regulatory environments in order to be listed on stock markets in countries with an emerging economy. Unlike stock markets in developed countries, in emerging markets, gaining government approval for listing is a critical and more unpredictable process for entrepreneurs. Hence, entrepreneurs who are preparing for a public offering might give substantially discounted shares to venture capital (VC) investors. This will lead to higher investment returns in pre-IPO deals than those at earlier stages, which distorts the risk-return tradeoff found in developed markets. In particular, the VC investors affiliated with powerful organizations that can promise entrepreneurs preferential access to stock market gatekeepers will gain even higher pre-IPO investment returns. The associated additional institutional rents earned by VC investors, however, are expected to decrease over time, as the stock markets mature. Related hypotheses with regard to the investment timing, VC firm affiliations with government agencies, securities traders, and universities are tested using data from ChiNext in China (2009–2013). This study highlights that institutional factors impact the behavior of participants in emerging markets. It extends current theories derived almost exclusively from developed markets.

KEYWORDS: ChiNext, emerging stock markets, high-growth entrepreneurial ventures, initial public offering, institutional factors, venture capital

INTRODUCTION

Initial public offerings (IPOs) provide entrepreneurs great opportunities for financing rapid growth (Brau & Fawcett, 2006; Pagano, Panetta, & Zingales, 1998). Because of the rapid development of IPO markets, burgeoning research attention over the past few decades has been paid to how entrepreneurs can succeed in IPO markets (Certo, Holcomb, & Holmes, 2009). However, the extant management and entrepreneurship studies on IPOs have focused primarily on stock markets in developed countries, especially the United States (e.g., Cumming & Knill, 2012;

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Florida & Kenny, 1988; Sapienza, Manigart, & Vermeir, 1996). Scholars have identified information asymmetry and agency problems as fundamental barriers to entrepreneurs pursuing good IPO outcomes over the short term (i.e., IPO pricing and allocation) and long term (i.e., market capitalization, profitability, and growth). Accordingly, the suggested solutions focus on corporate governance, upper echelons, and social influence (see Certo et al., 2009). Studies of stock markets in emerging countries remain few in number, despite the surge of stock market formation in China and other Asian and Eastern European countries (Ahlstrom & Bruton, 2006; Çetindamar, 2003; Dai, Jo, & Kassicieh, 2011; Tan, Huang, & Lu, 2013).

It is widely accepted that institutional factors can significantly shape firm strategies and performance (Wright, Pruthi, & Lockett, 2005). The underdeveloped regulatory environment in emerging markets creates different challenges for entrepreneurs aiming for IPOs. Compared to developed stock markets, stock markets in emerging economies not only experience high uncertainty but are also subject to tight controls by government authorities, including market access regulations (Lu, Tan, & Huang, 2013). In most developed stock markets, transparent and well-regulated institutional processes permit IPO-seeking firms access to the market if they meet specific criteria. In contrast, the majority of emerging stock markets employ a market entry process that draws more heavily on a case-by-case evaluation by government-appointed stock-market gatekeepers. The objective of these gatekeepers is to ensure market stability and growth by controlling the quality and size of new listings. The gatekeepers may even suspend new listings for a period (Meng, 2011). Hence, while high underpricing and low post-IPO performance already challenge entrepreneurs who enter emerging stock markets (Fan, Wong, & Zhang, 2007; Yu & Tse, 2006), the entrepreneurs must deal with another unique and daunting challenge: how to become listed on the IPO market. In this study, we join research efforts that examine the role of the institutional environment on entrepreneurial behavior and decisions for entering emerging stock markets. In particular, we investigate the question: 'How do entrepreneurs respond to the emerging stock market with high uncertainty and approval-based institutional processes to increase their chance of prevailing in the intense competition for access to the IPO market'?

This study answers the question with a focus on entrepreneurs' use of venture capital (VC) investors in the IPO process. Prior IPO studies on developed stock markets have found that VC investors help reduce IPO underpricing by leveraging their reputation to endorse the quality of issuer companies, thus reducing information asymmetry (Megginson & Weiss, 1991; Nahata, 2008). In emerging stock markets, however, the VC investors' roles may be different from their roles in developed markets. We argue that because of high uncertainty and approval-based institutional processes in the emerging stock market, entrepreneurs will tend to offer substantially discounted shares to VC investors who promise to provide value-adding service to access the IPO market. Hence VC investors,

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especially those with special relationships with stock-market gatekeepers may be able to obtain unusually high investment returns during the IPO stage. As pre-IPO investments are generally considered less risky than earlier-stage investments, the higher returns for pre-IPO deals have the potential to upend the 'risk-return trade-off' assumption, which is a fundamental financial investment principle (Ruhnka & Young, 1991).

We test hypotheses using the data of all VC-backed IPOs between 2009 and 2013 at the ChiNext stock market in China. All these IPOs were for small- to medium-sized, growth-oriented, and technology-focused private companies. The Chinese government finally launched this market in October 2009 after a long delay, mainly because of the bursting of the NASDAQ dotcom bubble in 2001 and debates over regulatory regimes. The government's declared goal is to create a Chinese NASDAQ, which provides listed companies with direct access to a large pool of equity investors and indirectly supports the development of a vibrant VC industry (CSRC, 2009). China is one of the largest and fastest-growing markets for VC investment (see Appendix Figure 1). ChiNext represents a typical emerging stock market with its approval-based market-access system, a not fully established institutional framework, and a large number of entrepreneurial ventures seeking market access. This empirical context offers unique opportunities for observing how entrepreneurs adapt their IPO behavior in response to such a dynamic institutional environment.

This study makes two theoretical contributions. First, this study enriches the institution-based view of business strategy by providing a fine-grained conceptual analysis of the relationship between institutional factors affecting IPO market access and investment returns from emerging stock markets. Our primary findings suggest that to access the IPO market, entrepreneurs pay institutional premiums to VC investors with institutional affiliations that promise preferential access to market gatekeepers. These institutional premiums, however, decrease as the stock market develops and regulatory reforms are implemented.

Second, this study sheds new light on the relationship between investment timing and investment returns by investigating the important role of institutional environment in emerging stock markets. In emerging stock markets, institutional factors that affect IPO market access have the potential to distort fundamental risk-return and VC-investment patterns known from established stock markets. These institutional conditions can lead to unusually high investment returns for VC deals during the pre-IPO stage. These findings contrast with findings in prior studies of developed stock markets, where well-established and transparent market access processes constrain opportunities for well-connected VC investors to gain additional institutional rents from pre-IPO stage deals (Gompers & Lerner, 1999). These findings have important policy implications. In emerging economies, policy makers intentionally create IPO opportunities and VC industries to support economic development by providing high-growth entrepreneurial ventures access to equity financing. The above-normal return opportunities for VC investments in

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the pre-IPO stage are likely to constrain the desired VC investments in early stage ventures. Our empirical findings identify related challenges and provide guidance for policy makers on how to address related market inefficiencies.

THE INSTITUTIONAL CONTEXT OF CHINA'S ChiNext

The institution-based view provides a valuable lens for observing and understanding firm behavior, especially in emerging economies. Several decades of research show that institutional factors tend to shape organizational behaviors and economic outcomes (see Greenwood & Meyer, 2008; Scott, 2008). Initial institutional research focused primarily on how the need for legitimacy explains organizational isomorphism through coercive, normative, and mimetic processes (DiMaggio & Powell, 1983; Suchman, 1995; Tolbert & Zucker, 1983). Subsequent research led to the institution-based view of the firm, which argues that firm strategy is based on institutional considerations, in addition to industry- and firm-level considerations (Hoskisson, Eden, Lau, & Wright, 2010; Peng, Wang, & Jiang, 2008; Peng, Sun, Pinkham, & Chen, 2009). This perspective suggests that under certain conditions a firm not only adjusts to its institutional environment but also shapes its institutional environment (Ahuja & Yayavaram, 2011; Oliver, 1991). Consequently, our understanding of firm strategy and behavior often requires an understanding of the firm's institutional environment.

Institutional environments offer important social referents for entrepreneurs who consider an IPO. VC investors are key stakeholders for start-up companies because they provide not only financial capital but also value-added services – including IPO related services (Gompers & Lerner, 1999; Sapienza, Manigart, & Vermeir, 1996). Hence, we expect that entrepreneurs' choice of VC investors is affected by institutional considerations, such as IPO stock-market conditions. The next section compares the institutional characteristics of the ChiNext emerging stock market with developed stock markets before proposing specific hypotheses.

In developed stock markets, such as those in the United States, the IPO process is highly transparent and open to all eligible companies. The established norms and procedures for stock-market access limit the discretionary power of gatekeeper institutions and make access more predictable. In addition, a watchful community of market analysts and other legal checks and balances monitor the implementation of these norms (Jeng & Wells, 2000; Leeds & Sunderland, 2003). Consequently, the main challenge for entrepreneurs pursuing IPOs is not accessing the IPO market but overcoming information asymmetry to convince prospective investors and to improve IPO performance, as indicated by higher IPO proceeds or lower underpricing (Certo et al., 2009). Related studies of VC choice have focused on the VC investors' social networks and reputation. Well-connected and reputable VC investors endorse the value of the issuing companies, which increases IPO and post-IPO performance. For instance, Echols and Tsai (2005) find that highly embedded VC investors take more firms to IPO that

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subsequently outperform the rest of the stock market than do investors with less established networks. Gulati and Higgins (2003) find that in cold markets, investors are more likely than underwriters to value issuing firms' ties to prestigious VC investors. In order to obtain investments from VC investors with better affiliations and reputations, entrepreneurs are willing to accept a discount on the valuation of their start-up (Hsu, 2004). In sum, prior studies of developed stock markets have focused on the certification role of VC investors and confirmed that entrepreneurs choose VC investors, taking into account the investors' reputation.

The institutional context of emerging stock markets, such as China's ChiNext, is distinctly different. In general, the IPO regulations for a new stock market tend to evolve, and higher levels of uncertainty are typical during the early years. Prior to ChiNext's launch in 2009, the central and local governments had considered various alternative stock-market regimes and policies since the late 1990s. Besides debates over regulatory regimes, ChiNext's actual launch was delayed by the bursting of the NASDAQ dotcom bubble in 2001. After ChiNext's launch, major adjustments were made to its IPO regulations. This created very high levels of uncertainty for companies contemplating IPOs on ChiNext. In transition economies, such as China's, this uncertainty is exacerbated by the conflicting institutional logic from socialism and capitalism (Bruton & Ahlstrom, 2003; Peng, 2003). Instead of a full-fledged adoption of standard market principles, a hybrid has emerged in which the government retains substantial discretionary power and interferes directly in the market (Carney, Gedajlovic, & Yang, 2009; Nee, 1992). In addition, China had no modern stock market prior to 1990, no corporate law until 1994, and no contract and securities law until 1999 (Lu et al., 2013). This creates additional uncertainty for market participants (Fuller, 2010).

In response, the government decided to maintain tight market control, which is typical of regulatory institutional frameworks in most emerging stock markets (Bruton & Ahlstrom, 2003; Bruton, Fried, & Manigart, 2005). This tight control is realized primarily through a 'charter system' for market entry. Although the stock markets in the United States use a 'registration system', a 'charter system' is used by the majority of emerging stock markets, for example, in China, Taiwan, India, and Southeast Asian countries. Out of concern that a large number of post-IPO firms will fail and this will hinder the development of a strong stock market, governments in emerging economies tend to design elaborate regulations and safeguards to ensure the quality of IPO issuers. In the United States, a firm that meets certain financial and organizational requirements is fundamentally eligible to launch an IPO on the NASDAQ with underwriters of the firm's choosing. On ChiNext, however, a similar firm needs at least one listing sponsor (i.e., a qualified securities-trading firm) and two deputy sponsors in the form of individuals who work for a listing sponsor and possess the necessary certifications. The listing sponsors and deputy sponsors serve the double function of guarantor

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and reference. In order to enforce careful firm selection, the Chinese stock-market authorities kept the number of certified listing sponsors and deputy sponsors small. In addition, a deputy sponsor is not allowed to act for several IPOs simultaneously. According to the WIND database (www.wind.com.cn), ChiNext had 65 listing sponsors and fewer than 1,000 deputy sponsors at the time of its launch in 2009. These conditions made obtaining sponsorship extremely competitive. The search for and acquisition of sponsors added another challenging step to an already longer and more complex IPO process compared to the US registration system.

In spite of the limited opportunities for market entry, the demand for going IPO in ChiNext was very high among entrepreneurs with high-growth ventures. These entrepreneurs typically face challenges in raising large loans from state-owned banks (Fung, Liu, & Yau, 2007). In addition, Chinese legal norms prohibit banks and insurance companies from investing in private equity directly (Lu et al., 2013). Hence, stock markets become crucial sources for entrepreneurs to obtain large equity investments. Stock markets not only give entrepreneurs access to a broad pool of potential investors but also endorse the quality of the ventures and thus can support long-term growth (Ding, Nowak, & Zhang, 2010). ChiNext has lower official requirements for IPO candidacy than other stock markets in China (i.e., the main board of the Shanghai Stock Exchange and the Small- and Medium-Size Enterprise (SME) board of the Shenzhen Stock Exchange). For instance, ChiNext-listed companies are required to have a net profit of RMB 5 million (about USD 0.8 million) the year before the IPO, while companies listed on the other stock markets in China must maintain three years of positive net profit before the IPO, during which the accumulated net profit must exceed RMB 30 million (about USD 4.8 million). These lower financial requirements have made ChiNext very attractive; hence, competition for entry to it has been very strong.

In summary, because of high interest in equity financing and limited alternative IPO opportunities, entrepreneurs compete intensely for access to ChiNext. To stabilize and create positive momentum for newly established stock markets, the government has created strong market-regulating institutions. In the absence of established regulatory norms, precedents, and transparency, these market-regulating institutions enjoy discretionary power in their evaluation and selection of stock-market entrants. These institutional conditions are likely to affect entrepreneurs' choice of VC investors to increase their chance of accessing the IPO market. We develop related hypotheses in the following section.

THEORETICAL BACKGROUND AND HYPOTHESES

At the heart of the institution-based view of the firm is the notion that institutions are more than mere background. Instead, 'institutions directly determine what arrows a firm has in its quiver as it struggles to formulate and implement strategy

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and to create competitive advantage' (Ingram & Silverman, 2002: 20). In the context of IPOs in developed stock markets, the relevant 'arrows' (i.e., resources) of VC investors are primarily their expertise and reputation, which certify the value of the issuer's company. In emerging stock markets, such as ChiNext, the relevant 'arrows' of VC investors may differ.

Given the institutional context mentioned above, we argue that the VC investors in ChiNext generally can help entrepreneurs in two aspects: reducing market uncertainty and facilitating access to the market. First, VC investors can provide valuable information that reduces the perceived uncertainty associated with ChiNext. Entrepreneurs typically have limited or no prior IPO experience. In contrast, VC investors often have gained such knowledge over time due to their repeated involvement in IPOs. They are also highly motivated to develop knowledge on how best to manage an IPO, which is one of the preferred options for cashing out their investment. Hence, their related knowledge promises direct benefits for entrepreneurs. The emerging and dynamic IPO conditions clearly present additional challenges. However, VC investors are far more likely and capable than entrepreneurs to invest the necessary time and effort to continuously update and expand their related knowledge. Given their lack of expertise and the high uncertainty associated with the IPO process, entrepreneurs with IPO aspirations may depend heavily on the guidance of their VC investors.

Second, if entrepreneurs compete intensely for stock-market access, but market access requires capabilities and expertise they do not possess, then entrepreneurs will greatly desire the support of VC investors. High uncertainty associated with emerging stock markets and the charter market access can strengthen entrepreneurs' beliefs in the value of support by resourceful VC investors – even though the beliefs might exceed the VC investors' actual capabilities.

Given these two general functions of VC firms, we hypothesize that in emerging stock markets, such as ChiNext, entrepreneurs are willing or even compelled to offer their shares at a substantial discount to obtain VC support (Hsu, 2004). In other words, VC investors who promise to provide value-adding pre-IPO services may enjoy more bargaining power and can ask for a low price per share (Lerner, 1994; Sapienza et al., 1996). Because low purchase prices per share increase the probability of high returns, the corresponding pre-IPO investments may generate higher investment returns.

We predict strong demand by entrepreneurs for VC support at the pre-IPO stage in emerging stock markets can lead to investment returns so high that they surpass the investment return at earlier stages. Since entrepreneurs are less likely concerned or worried about IPO-related issues at earlier stages, they do not need to offer extremely low prices to allure VC investors.

This prediction distorts the investment timing and investment return patterns with which we are familiar from equity financing markets in developed economies. In developed stock markets, studies have reported investment-return patterns

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consistent with fundamental financial risk-return considerations, that is, riskier, early-stage VC investments require substantially higher returns than later-stage investments (Manigart et al., 2002). Ruhnka and Young (1991), for example, reported that the US VC investors' required rates of return are 73% and 55% for seed and start-up investment, respectively, but rates decline to 35% for late-stage investment. Corresponding quantitative evidence for emerging markets, however, is not available. In the only study that we know, Karsai, Wright, Dudzinski, and Morovic (1999) reported, for the relatively smaller transitional economies in Hungary, Poland, and Slovakia, no clear and consistent effect of the investment stage on required investment returns. Nevertheless, recent qualitative grounded-theory research (Fuller, 2010) and conceptual papers (e.g., Lu et al., 2013) questioned the applicability of these established risk-return investment patterns for emerging economies. Our study goes beyond these speculations and empirically tests related hypotheses.

The primary reasons for the predicted distortion are differences in the institutional stock-market context. In developed stock markets, higher risks at earlier stages are the major factor for determining higher returns relative to later stage investments. In emerging stock markets, such as ChiNext, the institutional context makes the value-added pre-IPO services of VCs, i.e. helping the firm gain access to ChiNext, another extremely influential factor. This latter factor counters the risk-return effect. Very strong demand for pre-IPO VC services, in cases such as ChiNext, has the potential to dominate the risk-return considerations. Hence, we predict higher investment returns for pre-IPO stage investments compared to earlier stage VC investments.

Hypothesis 1: For startup companies with IPOs in an emerging stock market, VC investors that invest at the pre-IPO stage will experience higher returns on investment than VC investors that invest at earlier stages.

In H1, we argue that VC investors in general have the potential to support IPOs and that the value of this support is enhanced by the unpredictable nature of the institutional framework regulating market entry in emerging stock markets. In this section, we go beyond the arguments for higher return in pre-IPO investments that motivated H1 and identify the specific mechanisms through which some VC investors address and exploit the identified IPO challenges. In other words, we are trying to identify potentially valuable resources VCs can possess that enable them to provide highly valuable value-adding pre-IPO services.

This study focuses on the potential value of VC investors' institutional affiliation at the pre-IPO stage. The institution-based view extends a key institutional proposition: although the combination of formal and informal institutional frameworks shapes strategic choices (North, 1990; Tolbert, David, & Sine, 2011), in situations in which formal institutions are weak, informal institutions, such as interpersonal and inter-organizational relationships, play a larger role in driving firm strategies and performance (Peng & Heath, 1996), and such networks

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cultivated by managers can serve as informal substitutes for formal institutional support (Peng & Heath, 1996).

The general importance of informal relationships in China (*guanxi*) has been amply documented (Park & Luo, 2001; Zhang, Soh, & Wong, 2010). Recent qualitative studies have also generally supported the high relevance of *guanxi* for the IPO process in China and have investigated how it affects VC investor behavior (Fuller, 2010; Tan et al., 2013). In emerging stock markets, the 'charter system' gives the gatekeepers – stock-market authorities – more discretionary control. As entrepreneurs encounter the IPO process for the first time, they are unlikely to possess any substantial *guanxi* with stock-market gatekeepers. In contrast, VC investors are more likely to possess such *guanxi* because they deal with stock-market gatekeepers on a regular basis. Given the strong competition among entrepreneurs for market access, this *guanxi*-based influence is helpful if it increases the entrepreneurs' chances of being included in the pool of firms that the gatekeepers are considering for an IPO. As a result, entrepreneurs may seek support by VC investors that have strong institutional affiliations with market-regulating authorities. In the context of ChiNext, VC investors' institutional affiliations with government agencies, securities-trading firms, and universities or research institutes are likely relevant. In the following section, we elaborate on how each of these three types of affiliation has the potential to foster IPOs.

Affiliation Type

Government affiliation. Government-affiliated VC firms are defined as firms whose primary general partners or controlling shareholders are government agencies or state-owned enterprises. The Chinese government founded VC firms in order to pioneer support for technological innovation and the growth of new ventures (White, Gao, & Zhang, 2005; Zhang, Gao, White, & Vega, 2008). In China, most provinces and major cities set up their local government-affiliated VC firms in the late 1990s or early 2000s. For example, Shenzhen Capital Group is a leading Chinese VC firm. It was initiated by Shenzhen municipal government in 1999 and jointly funded by the government and a few large domestic listed firms. In addition to these government goals, these VC firms are also under pressure to generate profits (Tan et al., 2013). Through their administrative and social relationships, government-affiliated VC firms are connected to the China Securities Regulatory Commission (CSRC) – the main market-regulating authority and gatekeeper that ultimately grants stock-market access. These links to the CSRC promise more prompt, reliable, and detailed information on ChiNext decision-making, including impending changes in regulations and policies (Bruton & Ahlstrom, 2003). Thus government-affiliated VC investors may be better positioned to guide entrepreneurs in their IPO preparation and directly support their application for market entry. In addition, the CSRC is itself a government agency that also has a mandate to facilitate regional industrial restructuring and economic

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development with a particular focus on central and western China. Therefore, startup companies supported by government-affiliated VC firms, which are also chartered to support the same economic development goals, are likely to receive preferential consideration (Hutzschenreuter, Lewin, & Dresel, 2011).

Securities-trader affiliation. As outlined earlier, all companies applying for an IPO on ChiNext need at least one listing sponsor and two deputy sponsors, but these sponsors are extremely difficult to obtain due to their very limited number. Consequently, *guanxi* with securities-trading firms, which have employees who are qualified deputy sponsors, is a valuable resource. In September 2007, for the first time the CSRC approved two of the largest securities-trading firms for listing sponsorships, the China International Trust and Investment Corporation (CITIC) and the China International Capital Corporation (CICC), to establish their own VC subsidiaries. These subsidiary VC firms were allowed to use their parent firms as sponsors for IPO applications. By October 2010, an additional 29 Chinese securities-trading firms had obtained CSRC approval and established their own VC subsidiaries. A VC firm affiliated directly with a securities-trading firm is much better positioned to help entrepreneurs obtain sponsorship, which promises to support and speed up the IPO process. Given the expertise of the parent company in securities-trading and stock-market issues in general, securities-trader-affiliated VC investors are likely to possess the expertise and capability to guide entrepreneurs through the IPO process beyond obtaining sponsors. These capabilities might include direct *guanxi* with CSRC decision makers due to the security-trading parent companies frequent interactions with stock-market authorities. As a consequence, we expect that entrepreneurs with IPO aspirations consider investments from securities-trader-affiliated VC investors quite attractive.

University and research institute affiliation. Several universities and research institutes have also established VC firms to support technological innovation and the growth of high-tech companies. Again, these activities are guided by Chinese government policies (White et al., 2005). Examples include Tsinghua University, Peking University, Zhejiang University, and the Chinese Academy of Sciences – all of which are state-owned entities, which increases the likelihood that they will have relationships with other government entities, such as the CSRC. In addition, these VC firms and the CSRC have the same charter to support economic development through innovation and growth of high-tech companies. The combination of reputation, technological expertise, formal commitment to economic development goals, and potential relationships with the CSRC increases the likelihood of favorable CSRC evaluations for ventures backed by VC firms affiliated with these universities and research institutes.

In sum, we argue that the VC investors affiliated with government agencies, securities traders, or universities and research institutes have the potential to exploit these institutional affiliations to support IPOs of startup companies. Entrepreneurs

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who perceive the value of these institutional resources may offer discounted share prices, which enable such high VC returns. Thus, we propose:

Hypothesis 2: For startup companies with IPOs in an emerging stock market, the higher investment returns for pre-IPO deals than for early-stage deals will be more pronounced for VC investors that have affiliations with (a) government agencies, (b) securities-trading firms, or (c) universities and research institutes than VC investors without such affiliations.

As mentioned earlier, the high uncertainty in emerging stock markets forces entrepreneurs with IPO ambitions to contract with VC investors that can leverage their knowledge and social influence to make highly lucrative investment deals during the pre-IPO stage. In emerging stock markets, the initial institutional regulations and market conditions, however, tend to evolve substantially over time. Some of this change is incremental, as market participants develop routines, practices, and knowledge. Sometimes more disruptive changes occur, for example, when policy makers fundamentally revise and adjust key stock-market rules and regulations. For example, the Chinese government implemented several major policy changes in a year after ChiNext's launch, and the CSRC issued additional guidelines for securities-trading firms' investment activities. These guidelines stated that VC firms could no longer invest in companies sponsored by their parent securities-trading firms. This example illustrates how ChiNext's institutional framework and regulations became increasingly specific and established. In addition, over time, entrepreneurs became more familiar with stock-market processes. Their better understanding of the stock market and the IPO process should reduce their dependence on VC investor guidance and support, and we expect that also over time, as a consequence, the value of and demand for pre-IPO VC investments will decrease and the institutional rents earned by pre-IPO VC investors will diminish. Thus, we predict:

Hypothesis 3: For startup companies with IPOs in an emerging stock market, over time the higher investment returns for pre-IPO deals than for early-stage deals will become less pronounced as the institutional framework of the stock market develops.

METHOD

Sample and Data Sources

We examine all VC-backed IPOs on ChiNext between 2009 and 2013. In all, 355 companies completed an IPO on ChiNext prior to May 30, 2013, when data collection for the present study was completed. Given our interest in the effects of VC investment timing on investment returns, we focus only on IPOs of companies that received one or more VC investments.

ChiNext is a recently formed stock market with relatively well-documented and reliable IPO information. We collected financial data on each company from the

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RESSET database (www.resset.cn) and information about the evolution of its stock ownership from company prospectuses found on the Shenzhen Stock Exchange's website (www.szse.cn).

The unit of analysis is a single round of VC equity investment that a company received. In the case of syndicated investments, multiple VC firms invested in the same company at the same time and at the same price (Wright & Lockett, 2003). Thus, we treated any syndicated investment as one observation and used the lead VC firms' attributes to capture the relevant variables (Hochberg et al., 2007). We had to drop 16 observations because the VC firms sold part of their equity investment before the IPO, which prevented an accurate calculation of investment returns. We had to exclude seven other investments because of missing data. We carefully investigated VC investments based on other available qualitative and quantitative information. This allowed us to identify the following unconventional and potentially problematic types of VC equity investments: (1) in five cases, founder entrepreneurs invested in their own company, using another company also under their control; (2) in four cases, equity was transferred between two affiliated VC firms; and (3) in six cases, focal companies obtained strategic investments from upstream or downstream enterprises in their chain. In testing our hypotheses, we excluded these 15 highly unusual cases. Post-hoc robustness tests revealed, however, that including these fifteen observations does not substantively change the results. The final data set contains 260 equity investment deals of 188 startup companies with 184 different VC firms.

Variables

VC investment return. The internal rate of return (IRR) is the most broadly used measure of investment performance in both the finance literature and VC investment studies (Cochrane, 2005; Cumming & Walz, 2010; Nikoskelainen & Wright, 2007). As an annualized compounded return rate, IRR captures the time value of an investment. The formula is as follows:

$$IRR = \sqrt[T_1 - T_0]{V_1/V_0}$$

V_1 is the IPO value of the VC investment, which is the product of the number of shares and the opening price on the first day of public trading (i.e., offering price). V_0 is the value of VC firms' original investment, which is a product of the number of shares and the price of the original investment. T_1 is the date of IPO, and T_0 is the date of VC investment. As a robustness test, we also used the natural log of IRR, which tends to improve the normality of IRR data distributions. Given that the results were virtually identical, we opted to report results using IRR, which are easier to interpret.

We calculated investment returns at the time of IPO. Following Nikoskelainen and Wright (2007) and Cochrane (2005), we used the offering price. For any specific VC firm equity investment, the actual experienced return depends on when

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the VC firm eventually sells its shares. Thus, the reported investment returns at the time of IPO reflect 'book values'. Any attempts to capture actual investment returns suffer from the difficulty of controlling for other factors that might have affected a company's stock price between the IPO and the eventual sale of shares. Hence, this study tests hypotheses using investment returns on the date of the IPO. As additional robustness tests, however, we also provide results using investment returns one year after the date of the IPO. The additional test also addresses an important ChiNext regulation, which requires non-controlling shareholders to hold their equity for a minimum of one year after the IPO. The results are reported in section 5.4.2.

Investment timing relative to IPO (T). Investment timing relative to IPO (T) refers to the elapsed time in years from the date of investment (T_0) to the date of the IPO (T_1). The date of investment is the exact day on which the investment agreement was signed. For 112 observations, this date was unavailable. In these instances, we instead used the day on which shareholders approved the investment. If only the month was specified (35 observations), we used the fifteenth of the relevant month. The average investment time is 2.48 years (s.d. = 1.68).

VC firm institutional affiliation. We identified institutional affiliations using company prospectuses. Following prior studies (Hsu, 2004, 2007), if there was more than one VC firm involved in a single round of investment, we focused on the lead VC firm. The lead VC firms tend to dominate investment processes, including negotiating investment terms and the selection of board members. *Government affiliation* is a dummy variable coded 1 if at least one of the general partners or controlling shareholders of the lead VC firm is a government agency or state-owned enterprise. *Securities-trader affiliation* is a dummy variable coded 1 if the lead VC firm is a subsidiary of a securities-trading firm that is qualified for listing sponsorship. *University affiliation* is a dummy variable coded 1 if the lead VC firm is affiliated with a university or research institute. Finally, we created a dummy variable *government/securities-trader/university affiliation*, coded 1 if any of the preceding dummy variables is coded 1.

IPO market periods. Period 2 is a dummy variable coded 1 to identify IPOs that occurred during the later and more institutionally developed period. The cutoff date is December 20, 2010 – one year after ChiNext was opened. Several key public policies changes aimed at regulating ChiNext and its IPO processes took effect on this date. The early period has 101 observations and the late period 159.

Control variables. We have drawn on the IPO literature to identify various other factors that can influence VC investment returns. First, this study controls for the startup company's pre-IPO performance using the average *return on equity (ROE), growth rate of the main business*, and *net profit ratio* in the three years before the IPO.

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Second, we control for *company age at IPO*, *number of funding rounds before IPO,* and *market value at IPO*. These variables capture differences in the company's maturity and size (Gompers, 1996). A third group of controls captures the following VC characteristics: (1) *fund size*, measured by the total amount of funds invested before T_0 (Gompers & Lerner, 1999); (2) *VC age at* T_0; and (3) *number of IPO exits*, measured by the number of companies that went to IPO before T_0. Fourth, we control for the extent to which VC firms were involved in the company's management and decision-making processes using: (1) *VC firms' ownership*, which captures the percentage of equity owned by VC firms, and (2) *VC board seats*, which captures the percentage of board seats occupied by VC firms. Finally, we included IPO year dummies and industry dummies.

Data Analysis

We used two-stage least square (2SLS) regression analysis to address potential endogeneity issues related to omitted variables that affect both the independent variable *T* and the dependent variable *IRR* (Bascle, 2008). In the first stage of the 2SLS, we used *number of funding rounds before IPO* to predict *T*. This instrument satisfies the 'relevance' requirement because it is likely to be positively associated with the independent variable *T,* as more prior rounds of funding indicate both a more mature and established company and, on average, longer VC involvement. Moreover, the instrument satisfies the 'exclusion' restriction as to our knowledge there is no theoretical reasoning *per se* suggesting that a large number of funding rounds before an IPO creates opportunities that make a particular VC investor gain a high *IRR* directly. The use of this instrumental variable is further supported by a high Cragg-Donald Wald *F*-statistic ($F = 17.18$, above the threshold value of 10) (Stock, Wright, & Yogo, 2002) and a lack of an effect on *IRR* when included in the second-stage model 1 ($b = -13.74$, $p = 0.162$; $CI_{95\%}$ [−33.0, 5.6]) (Murray, 2006). Hence, this instrumental variable meets suggested validity criteria (Semadeni, Withers, & Certo, 2014).

We used the command ivregress in STATA 12 to conduct the regressions. This study reports random-effect models that control for industry and year-fixed effects, while using robust standard errors to account for remaining heteroscedasticity.

RESULTS

Table 1 lists the descriptive statistics and correlations for all variables except IPO year dummies and industry dummies. Table 2 shows the two-stage least-square regression results for hypothesis testing. The first column reports the first-stage regression predicting *T*. This model shows a positive effect for *number of funding rounds before IPO* ($b = 0.47$; $p = 0.005$; $CI_{95\%}$ [0.14, 0.80]). The other columns show the second-stage regressions predicting *IRR*. Model 1 includes *T* and allows a test of H1. Model 2 adds the variable *government/securities-trader/university affiliation*. The

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Table 1. Descriptive analysis and correlation matrix

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	IRR (%)	211.00	119.92	1.00																
2	T	2.48	1.67	−0.27	1.00															
3	Gov/S.T./Uni affiliation	0.48	0.50	0.16	0.15	1.00														
4	Gov. affiliation	0.27	0.44	0.13	0.13	0.62	1.00													
5	Sec. Trader aff.	0.12	0.32	0.05	−0.11	0.38	−0.17	1.00												
6	University affiliation	0.12	0.32	0.04	0.16	0.38	−0.14	−0.13	1.00											
7	Period 2	0.61	0.49	−0.17	−0.04	−0.10	−0.13	0.00	−0.01	1.00										
8	ROE (%)	32.62	12.68	0.18	−0.27	−0.02	0.02	0.02	−0.11	−0.08	1.00									
9	Growth (%)	81.39	111.57	−0.03	−0.06	−0.05	0.02	−0.02	−0.08	0.19	−0.07	1.00								
10	Net Profit (%)	21.17	10.28	0.00	−0.04	−0.05	−0.08	0.05	−0.03	0.01	0.27	0.17	1.00							
11	Ln(Company age)	2.25	0.46	−0.09	0.08	0.07	0.01	0.07	0.03	0.02	−0.18	−0.11	−0.12	1.00						
12	Ln(Market capital)	21.86	0.57	0.18	0.04	0.05	−0.08	0.06	0.11	−0.35	0.20	0.00	0.23	−0.18	1.00					
13	VC fund size (mil. RMB)	6.86	10.41	−0.06	−0.14	0.13	0.08	−0.11	0.21	−0.04	0.02	−0.02	0.09	0.01	−0.02	1.00				
14	Ln(VC Age)	0.76	1.51	0.14	−0.02	0.23	0.23	−0.01	0.06	−0.03	0.02	−0.02	0.01	−0.02	−0.03	0.30	1.00			
15	Ln(No. of IPO exits)	1.84	1.42	−0.04	−0.09	0.23	0.17	0.07	0.03	−0.08	0.10	−0.02	0.07	−0.06	0.03	0.59	0.39	1.00		
16	VC ownership (%)	9.75	7.43	0.06	0.15	0.17	0.27	−0.11	0.06	−0.01	−0.11	0.03	−0.16	−0.08	−0.16	0.06	0.18	0.06	1.00	
17	VC board seats (%)	17.86	12.43	0.27	0.12	0.12	0.09	−0.04	0.11	−0.15	−0.12	0.00	0.00	−0.04	0.13	−0.06	0.11	0.01	0.26	1.00
18	No. of funding rounds	1.80	1.01	−0.12	0.23	0.07	−0.01	−0.04	0.17	0.06	−0.27	0.08	0.15	0.09	0.20	0.12	0.11	0.06	−0.21	0.14

Notes: $N = 260$. Correlation values greater than 0.12 are significant at $p < 0.05$.

Table 2. 2SLS Analysis for VC Investment Return IRR

	1st Stage	2nd Stage: DV = IRR											
	DV = T	(1)	(2)	(3) Any aff. = 0	(4) Any aff. = 1	(5)	(6)	(7)	(8) Gov. aff. = 0	(9) Gov. aff. = 1	(10)	(11) Period = 0	(12) Period = 1
T		−48.5*	−52.0*	−16.6	−71.7*	−53.6*	−49.0†	−51.1*	−22.8	−164†	−47.6*	−61.6*	−24.1
		(24.1)	(25.3)	(24.6)	(31.9)	(27.3)	(25.5)	(24.8)	(17.5)	(89.4)	(22.7)	(29.5)	(28.7)
No. of funding rounds	0.47**												
	(0.17)												
Gov/S.T./Uni aff.			51.4*										
			(20.7)										
Gov. aff.						52.1†							
						(30.4)							
Sec. Trader aff.							−7.23						
							(22.1)						
Univ. aff.								39.5					
								(29.9)					
Period_2_dummy											−30.4		
											(56.6)		
ROE	−0.027***	0.24	0.16	0.47	1.10	−0.074	0.21	0.26	0.33	−3.03	0.24	0.97	0.096
	(0.0073)	(0.91)	(0.91)	(1.28)	(1.37)	(1.03)	(0.94)	(0.90)	(0.93)	(5.13)	(0.90)	(1.33)	(1.34)
Growth	−0.0010	−0.081	−0.094	−0.093	−0.055	−0.11*	−0.083	−0.076	−0.13*	−0.048	−0.083	−0.20	−0.063
	(0.00074)	(0.059)	(0.060)	(0.079)	(0.081)	(0.065)	(0.060)	(0.058)	(0.077)	(0.17)	(0.060)	(0.17)	(0.057)
Net profit	0.019***	−0.54	−0.43	−0.81	−0.54	−0.44	−0.53	−0.43	−0.76	3.58	−0.60	−3.28*	0.96
	(0.0074)	(0.81)	(0.82)	(0.94)	(1.46)	(0.82)	(0.81)	(0.83)	(0.73)	(4.09)	(0.84)	(1.62)	(0.77)
Ln(Company age)	0.27	3.14	−0.28	−34.0†	34.8	3.52	3.68	3.72	−24.4	78.0	3.07	−51.8	−1.24
	(0.17)	(18.1)	(17.7)	(18.8)	(30.8)	(18.6)	(19.0)	(18.3)	(15.4)	(57.6)	(17.9)	(32.8)	(16.1)

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Table 2. Continued.

	1st Stage	2nd Stage: DV = IRR											
	DV = T	(1)	(2)	(3) Any aff. = 0	(4) Any aff. = 1	(5)	(6)	(7)	(8) Gov. aff. = 0	(9) Gov. aff. = 1	(10)	(11) Period = 0	(12) Period = 1
Ln(Market capital)	0.26	46.9	44.8	12.2	82.8	54.1	47.4	43.8	16.7	212*	48.0	85.3	13.3
	(0.21)	(32.9)	(31.7)	(19.2)	(54.2)	(35.1)	(34.0)	(33.0)	(17.1)	(91.8)	(34.5)	(59.5)	(19.0)
VC fund size	−0.027***	−1.60*	−1.55*	−0.50	−2.52†	−1.62*	−1.67*	−1.98*	−1.41*	−4.74	−1.57*	−1.61	−1.04
	(0.0089)	(0.64)	(0.67)	(0.97)	(1.06)	(0.68)	(0.78)	(0.82)	(0.67)	(5.92)	(0.62)	(1.22)	(0.89)
Ln(VC age)	−0.048	12.3*	9.69†	2.77	11.9	9.52†	12.2*	12.1*	8.44†	−7.04	12.4*	20.2†	5.35
	(0.077)	(5.93)	(5.43)	(5.19)	(11.1)	(5.32)	(5.91)	(6.01)	(4.37)	(24.2)	(6.09)	(11.9)	(5.72)
Ln(No. of IPOs)	0.011	−6.18	−9.88	4.31	−22.3**	−7.99	−5.77	−5.05	4.22	−16.1	−6.56	−21.9	0.87
	(0.080)	(7.32)	(8.10)	(9.13)	(11.3)	(7.77)	(6.93)	(7.50)	(5.45)	(28.3)	(7.69)	(16.9)	(6.07)
VC ownership	0.045**	2.24†	1.68	0.90	1.00	1.62	2.24†	2.21†	1.04	0.72	2.17†	3.28	0.42
	(0.012)	(1.18)	(1.13)	(1.44)	(1.73)	(1.16)	(1.19)	(1.19)	(1.16)	(5.07)	(1.12)	(2.35)	(1.16)
VC board seats	0.0013	2.49*	2.49*	1.01	3.62**	2.57*	2.49*	2.44*	1.57**	3.69	2.52*	4.80*	1.02*
	(0.0073)	(0.99)	(0.99)	(0.73)	(1.49)	(1.00)	(0.99)	(1.00)	(0.58)	(2.51)	(1.04)	(2.03)	(0.51)
Constant	−5.58	−783	−730	12.3	−1,577	−919	−793	−714	−104	−3,997*	−777	−1,235	−130
	(4.54)	(701)	(675)	(421)	(1,142)	(740)	(721)	(704)	(370)	(1,882)	(689)	(1,229)	(405)
Observations	260	260	260	135	125	260	260	260	191	69	260	101	159
Wald Chi^2		286.01	294.02	372.83	40.37	309.65	326.71	384.92	228.68	22.56	318.94	366.55	355.77

Notes: Robust standard errors in parentheses. Industry and year dummies are included, but not shown. $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\dagger}p < 0.1$ (two-tailed tests).

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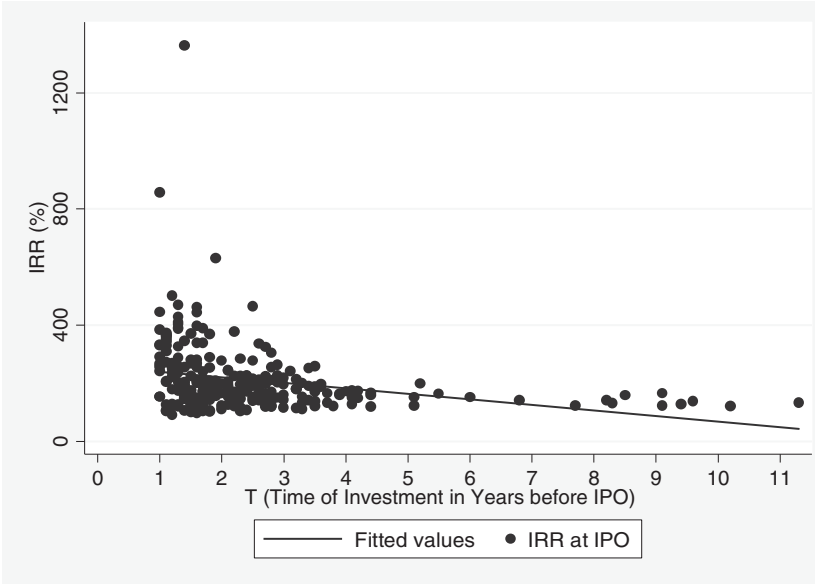

Figure 1. The relationship of investment returns and timing to IPO (H1).

next two columns report regression results for samples containing either equity deals with affiliated VC investors (Model 3) or non-affiliated VC investors (Model 4). These split samples are used to test H2. To further probe the affiliation effects, Models 5–7 show effects for the three different types of affiliations separately. Model 5 shows the effect of *government affiliation* on *IRR* ($b = 52.1$; $p = 0.087$; $CI_{95\%}$ [−7.58, 111.70]). Models 8 and 9 investigate this effect further by splitting the observations into two subsamples according to the presence of government affiliation. Finally, Models 10–12 introduce a *period dummy* and split samples to test H3.

Overall Effects of Investment Timing on Investment Returns (H1)

H1 predicts a negative relationship between T and *IRR*. In Model 1, the effect of T is negative ($b = -48.5$; p = 0.044; $CI_{95\%}$ [−95.7; −1.3]), which supports H1. The result suggests that, on average, *IRR* increased by 48.5% if the VC investors invest one year closer to the IPO date. Figure 1 shows a scatter plot of observed *IRR* values over time.

VC Firm Institutional Affiliations (H2)

H2 predicts that the positive IRR effect of equity investments closer to the IPO date is stronger for investment deals with VC investors that have institutional affiliations with government agencies, securities-trading firms, or universities than deals with VC investors without such affiliations. To test H2, we first added the dummy variable *government/securities-traders/university affiliation* in Model 2. These VC affiliations have a positive effect ($b = 51.4$; $p = 0.013$; $CI_{95\%}$ [−101.6,

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−2.4]) independent of investment timing. The *IRR* of investments by affiliated VC investors is about 51.4% higher than investments by non-affiliated VC investors. In a second step, we investigate whether the affiliation of VC investors affected the investment-timing effects on investment returns. We did not use conventional product terms to test the contingency effect, because using product terms in 2SLS may not provide consistent regression coefficient estimates (Wooldridge, 2002). To test H2, we created two subsamples – one containing only investment deals with affiliated VC investors and the other containing only investment deals with non-affiliated investors. We then compare the estimated effects of T on *IRR* across the subsamples. Model 3 contains investments by VC investors without affiliations. Here T has no systematic impact on *IRR* ($b = -16.6$; p = 0.501; $CI_{95\%}$ [−64.8, 31.7]), while in Model 4, for the sample of VC investors with affiliations, T has a substantially stronger negative impact on *IRR* ($b = -71.7$; $p = 0.024$; $CI_{95\%}$ [−134.2, −9.3]) consistent with H2. In addition, this coefficient of T in Model 4 ($b = -71.7$) is located outside the 95% confidence interval for the mean T in Model 3 [−64.8, 31.7]. The results indicate that not only were deals with affiliated VC investors, on average, more expensive for entrepreneurs, but these deals were also more likely to be closer to the IPO date. Meanwhile, there is no similarly strong effect of investment timing for deals with VC investors without institutional affiliations. Overall, these findings support H2.

We further probed the effects for each of the three types of affiliations separately, but conscious of the challenges associated with the reduced number of observations for each type. First, Models 5, 6, and 7 demonstrate the main effects of each type of the affiliations respectively. The results indicate that only government affiliation had a marginally statistically positive effect on IRR. Since deals with *government-affiliated* VC investors led to higher *IRRs*, we again created two subsamples according to whether the VC investors are government affiliated. We found results similar to those in Models 3 and 4. In Model 8, for the sample of VC investors without such affiliations, T has no systemic impact on *IRR* ($b = -22.8$; p = 0.193; $CI_{95\%}$ [−57.2, 11.5]), while for the sample of VC investors with government affiliations (Model 9), T has the predicted negative impact on *IRR* ($b = -164$; $p = 0.066$; $CI_{95\%}$ [−339.7, 10.8]). Again, this coefficient of T in Model 9 ($b = -164$) is located outside the 95% confidence interval for the average effect of T in Model 8 [−57.2, 11.5]. Figure 2 plots the IRRs for deals with government-affiliated VC investors versus deals with investors without government affiliations. This graph also identifies one government-affiliated VC deal with an extremely high IRR. Such high IRRs, however, are part of the portfolio approach of VC investments and hence are relevant observations. Such extreme outcomes, however, can be highly influential in regression analysis. In our case, reported findings do not change when this single observation is dropped. Overall, these results suggest that H2 is also supported when we look only at deals with government-affiliated VC investors.

The investigation into the impacts of different types of institutional affiliations revealed important nuances. The reported findings support the positive affiliation

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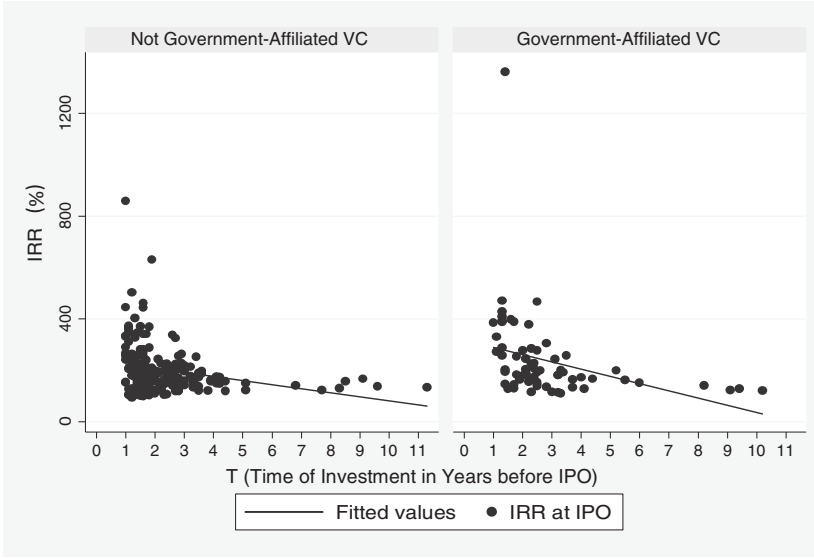

Figure 2. The roles of government affiliation in improving investment return in different deals (H2).

effect for government affiliation as well as the contingency of the observed timing effect on the government affiliation of the VC investors. However, no similar effect was observed for securities-trader affiliations or university affiliations. How should one interpret this finding? In our opinion, one, needs to take into account the small number of observations with securities-trader and university affiliations ($n = 31$ and $n = 30$, respectively), which reduced the power of the related empirical tests. In addition, securities traders gained permission to make equity investments in their sponsored companies only after September 2007 and only then started forming their own VC firms. This not only explains the small number of investments with security-trader-affiliated VC investors but also implies that, by definition, investments more than five years before IPO do not exist in the dataset. Hence, we argue that the lack of statistical power and the constrained variance in T demand a cautious interpretation of the absence of a clear systemic effect for securities-trader- and university-affiliated VC deals in our empirical data.

Impact of Institutional Changes over Time (H3)

H3 hypothesized that the negative relationship between T and *IRR* will become weaker and less pronounced over time as the stock market develops its institutional framework. Model 10 includes a dummy variable for the later period, which has no clear systemic effect on *IRR* ($b = -30.4$; $p = 0.592$; $CI_{95\%}$ [−141.3, 80.6]). The next two columns split the sample observations into VC deals made during the earlier period (Model 11) and during the later period (Model 12). These subsamples enable a comparison of the relationship between T and *IRR* for each period. In Model 11 for the early period, T has a significantly negative impact on *IRR*

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($b = -61.6$; $p = 0.037$; $CI_{95\%}$ [−119.4; −3.9]), while for the later period the effect of T is smaller and no longer statistically significant (Model 12: $b = -24.1$; $p = 0.401$; $CI_{95\%}$ [−80.3, 32.2]). These results are consistent with H3 and offer moderate support for the argument that the pre-IPO benefits were stronger during the early period after creation of the stock market and diminished as the stock market regulations matured.

Additional Analyses and Robustness Tests

Alternative measures on investment return. For a deeper investigation of investment return effects, we also considered two alternative investment-outcome measures that have been used in studies of developed stock markets: (1) simple multiplier V_1/V_0, and (2) public-market equivalent (PME). PME is a market-adjusted multiplier introduced by Kaplan and Schoar (2005) that has been well received by finance scholars studying US markets (e.g., Harris, Jenkinson, & Kaplan, 2014). PME reflects the return on VC investments relative to public equity. A higher PME indicates a higher return, and a PME greater than one indicates returns that outperformed the market. The formula is:

$$PME = \frac{V_1/V_0}{Index_1/Index_{0,}}$$

where V_1 is the IPO value of the VC investment, V_0 is the value of VC firms' original investment, $Index_1$ is the Shanghai Stock Exchange Composite Index on the date of the IPO, and $Index_0$ is the same index on the date of VC investment. Results remain unchanged for hypothesis tests using V_1/V_0 or PME.

Post-'lockup' period. To address the impact of one-year 'lockup' regulations, we also estimated *IRR* using share price data one year after the IPO. When calculating V_1, we applied the startup's average stock price for the first five days one year after the IPO. Such long-term effects are difficult to detect because of the far longer causal chain and the unaccounted-for factors that might have affected the price of a company's stock during the first year it was offered on the stock market. Hence, results are weaker but remain fundamentally consistent.

Variance of investment returns. The ability of only *some* VC investors, which possess the relevant institutional affiliations, to buy shares at a discount during the pre-IPO stage implies a potential increase in the range and variability of investment returns for that stage than for earlier VC investments. This consideration suggests another indirect way to investigate whether observed VC investments and investment outcome patterns are consistent with our theoretical model.

Table 3 contains the results of simple split-group analyses comparing the variability of investment returns for early-stage and late-stage investments. We used the median of T as the split-group cutoff. A robust F-test, which compensates

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Table 3. Split-group comparison across time for mean IRR and IRR variance

	Two-Way Split Sample		*Three-Way Split Sample*		
	Early Investment (11.3–2.1) [a] *Period 1*	*Late Investment (2.0–1.0) Period 2*	*Early Investment (11.3–2.7) Period 3*	*Medium Investment (2.6–1.7) Period 4*	*Late Investment (1.6–1.0) Period 5*
Mean IRR	178.3	242.7	171.7	196.3	264.4
t-Test for Mean Differences	Period 1 ≠ Period 2: t=4.54***			Period 3 ≠ Period 4: t=2.32*	
				Period 4 ≠ Period 5: t=3.34**	
				Period 3 ≠ Period 5: t=4.96***	
SD of IRR	55.6	152.9	46.1	84.3	170.6
F-Test for SD Differences	Period 1 ≠ Period 2: F=24.49***			Period 3 ≠ Period 4: F= 5.79*	
				Period 4 ≠ Period 5: F=10.25**	
				Period 3 ≠ Period 5: F=24.70***	
Coefficient of Variation	0.23	0.86	0.27	0.43	0.65
N	128	132	91	80	89

Notes: All t-tests assumed unequal variances in subsamples; SD differences were analyzed using the robust F-test using 10%-trimmed means proposed by Brown and Forsythe (1974) that account for deviations from normality. Results using alternative robust F-tests based on medians instead of trimmed means lead to consistent findings.
[a] Elapsed time between day of investment and IPO in years.
† p < .10; * p < .05; ** p < .01; *** p < .001 (two-tailed tests).

for sample size differences and deviations from normality (Brown & Forsythe, 1974), shows a clear increase in the variance for pre-IPO-stage investments ($\Delta SD = 97.3$; $F = 24.49$; $p < 0.001$). The standard deviation tripled. The coefficient of variation, which accounts for increases in the mean, also increased by 0.63. Results for the split in three equal periods (columns 3–5) also show a substantial increase in investment-return variability for VC deals closer to the IPO. A split-group comparison, however, cannot account for any other differences in the types of investments across time periods. Thus, we also estimated mixed-effects models that control for relevant fixed differences between early- and late-stage investments, before evaluating the IRR variability differences by comparing models with different types of random-effects coefficients. These mixed-effect models generated results similar to those in the simple split-group analyses, which are consistent with our expectations. Results for the mixed-effect models are available on request.

DISCUSSION

We examined the 188 VC-backed companies listed on ChiNext during the first few years after the market was launched in 2009. Contradicting the conventional belief and evidence in the United States and other developed stock markets, our empirical results indicate higher investment returns for pre-IPO deals than for earlier

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deals. Moreover, we found that the high returns are associated with institutional factors. Not all VC investors investing in pre-IPO deals benefited equally – the investors affiliated with government agencies enjoyed higher investment returns. This illustrates that alternative institutional mechanisms can compensate for a stock market's weak formal institutional framework. Moreover, we found that, over time, the above-normal returns diminished as the formal institutional framework became more established.

Theoretical Contributions

The primary theoretical contribution of this study is the extension of the institution-based view of business strategy by offering a more fine-grained conceptualization of how institutional frameworks in emerging stock markets can affect entrepreneurs' strategies for accessing the IPO market. Our novel finding that entrepreneurs pay institutional premiums to VC investors to access the IPO market complements the findings of Tan et al. (2013), the pioneer work on the roles of VC investors in China's stock markets. In their study of China's Shenzhen SME stock market, the authors concluded that VC firms do 'not add value to their investees: They neither bring younger firms public nor reduce IPO cost' (Tan et al., 2013: 152–153). Findings in both studies of China's stock markets diverge from prior studies of developed stock markets, which have reported that the value added by VC investors in the IPO process is grounded in the investors' industry-specific expertise and market reputation (e.g., Echols & Tsai, 2005; Gulati & Higgins, 2003). By demonstrating the distinctive effects of institutional environments on IPOs in emerging stock markets, this study encourages more work in this research stream.

In essence, this study advances research on the impact of VC investment timing on IPO-related investment returns by highlighting a largely omitted category of factors in prior studies: institutional environment. Our findings correct conventional expectations derived primarily from developed stock markets, where mature institutional frameworks constrain opportunities for pre-IPO-stage investors to earn above-average institutional rents (Gompers & Lerner, 1999). Therefore, this study contributes to the development of an adjusted theory for emerging stock markets. As one key explanation, we find support for the important role of institutional factors in the form of direct affiliations between VC firms and government agencies. Our empirical results show that VC firms with government affiliations have a *direct* positive effect on IRR (Table 2 model 5), which could be attributed to many supportive roles such a VC can play throughout *various* investments stages. However, the strong *moderating* effect for investment timing (Table 2 models 8 and 9) clearly indicates the crucial role attributed to VC firms with government-affiliation during the *pre-IPO* stage. These findings extend prior research that has shown how institutional factors can affect VC investment behaviors in general, from selecting, funding, and structuring relationships with

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entrepreneurs to exiting from these relationships (Ahlstrom & Bruton, 2006; Lu et al., 2013; White et al., 2005). To our knowledge, no prior quantitative empirical study has reported on the critical interdependence of VC investment timing, VC firm institutional affiliation, and IPO-related investment returns.

From an economic development perspective, this study offers theoretical and empirical explanations for the well-reported phenomenon of a dearth of early-stage VC investments in emerging economies. White et al. (2005) and Tan, Zhang, and Xia (2008) also reported that the focus of investment priority among Chinese VC firms was the growth and pre-IPO stages. The observation is further supported by data from *Asian Venture Capital* (AVCJ, 2011). For the period 2000 to 2010, this source reported that only 15% of VC investments were in startup or early-stage ventures while 38% and 26% were in expansion-stage and pre-IPO ventures respectively. This study suggests that the particular institutional environments offer VC investors the opportunity to earn above-average investment returns with pre-IPO deals, which may directly influence VC decisions not to engage in early-stage ventures.

Implications for Entrepreneurs and VC Investors

This study has important implications for entrepreneurs choosing VC investors. Our findings suggest that in emerging stock markets, financial risk considerations can be strongly mitigated and dominated by institutional factors. Entrepreneurs may have to pay institutional premiums to VC investors in order to overcome institutional barriers, such as those to IPO market access. This study shows that entrepreneurs pay particularly high premiums to government-affiliated VC investors, which they perceive as offering greater access to or better recognition by stock-market gatekeepers. To what degree these VC investors actually deliver on these expectations remains an open question.

The presented findings also provide input for VC firm strategy considerations. For one, VC investors entering emerging markets need to carefully evaluate whether they possess the institutional relationships necessary to succeed, given the nature of IPO market entry regulations. As an alternative or complement to developing such institutional relationships, VC investors might exploit opportunities related to the largely neglected early-stage investments. A substantial body of research shows that VC investors can support early-stage startup companies not only with financial resources but also with management know-how and social networks (Certo et al., 2009). Similar detailed investigations of late-stage deals are rare at the time of writing. Recent anecdotal evidence from developed economies points to the emergence of innovative late-stage VC practices in the form of side agreements that may include discounted IPO stock prices, minimum return-on-investment guarantees, or extra shares if the entrepreneurs later raise money at a lower valuation (Smith, 2015). The relevance and implications of

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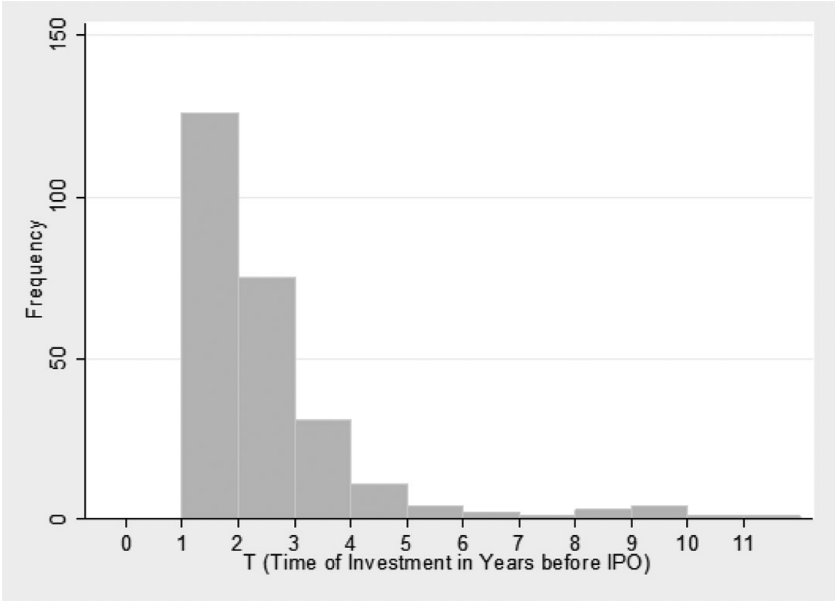

Figure 3. Frequency of investment deals by time of investment in years before IPO.

such late-stage side agreements in less-transparent and more-uncertain emerging economies represent a promising field for future research.

Implications for Policy Makers

ChiNext was launched to encourage early-stage VC investment by offering VC investors an attractive way to cash in on their successful investments. The observed investment patterns indicate that ChiNext did not accomplish this objective during its early years of operation. Figure 3 shows the frequency of deals across the time of investment relative to the IPO. VC investments remained concentrated in the late stages, and 79% of investments occurred up to three years before the IPO. In contrast, only 6% occurred five or more years before the IPO. In comparison, US VC investors invest far more frequently during earlier stages – one-third of funds tend to be invested at seed and early stages, one-third at expansion stages, and only one-third at later stages (NVCA, 2013).

We believe the concentration of pre-IPO investments is the result of purpose-built market entry controls aimed at supporting market development, stability, and growth. Attempts to ensure the high quality of market entrants created opportunities for seeking institutional rents, as well as unintended incentives for VC investors to focus on pre-IPO investments. These findings suggest a need for systemic reform of the institutional environment to encourage early-stage VC investments in high-tech and growth-oriented companies.

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First, the government should reduce opportunities for earning institutional rents during the pre-IPO stage by creating a more transparent stock-market entry process based on explicit and known criteria. This is likely to reduce opportunities for inter-organizational affiliations and corresponding personal relationships to affect IPO market-entry decisions. The reported findings reveal that institutional rent effects diminished as ChiNext added more specific and explicit norms to regulate IPO market access. We interpret this as early evidence that adjustments in the institutional market framework can curb the institutional rent of VC investors. This finding is also consistent with more recent reports on ChiNext. According to Zero2IPO (2012), the proportion of investment in early-stage deals increased from 4.8% in 2010 to 7.3% in 2011 and 10.5% in 2012. This emerging market thus increasingly meets the initial policy objective of supporting early-stage startup companies.

Second, this study highlights the critical trade-offs that policy makers face. Institutional factors that support market stability and growth can distort common VC investment practices and related economic development benefits. An initial strong focus on stability and growth, however, might be necessary to establish a new stock market. More flexible and discretionary stock-market access procedures can offer benefits that consider the dynamic and, to some degree, unpredictable nature of related challenges. In this case, policy makers and other stakeholders need to be patient and realistic in their initial economic development expectations. It may take years before the desired levels of early-stage and growth-stage VC financing opportunities for entrepreneurial firms emerge. In addition, policy makers should thrive to transition to more transparent and predictable market access regimes as early as possible.

Limitations and Avenues for Future Research

First, the matter of generalizability is always pertinent in empirical studies. Are the observed empirical patterns unique to China or do they apply to markets in other emerging countries (Barney & Zhang, 2009; Tsui, 2006)? Considering the dominant role of government agencies and the well-established role of relationships (*guanxi*) in China (Chen, Chen, & Huang, 2013; Luo, Huang, & Wang, 2012; Park & Luo, 2001), we speculate that the observed effects of institutional affiliations with government entities may be especially pronounced in the Chinese context. However, powerful government institutions and the importance of relationships with government institutions are characteristics also found in other emerging economies. Future empirical research promises a more nuanced understanding of the effect of institutional affiliations across different national contexts.

Second, we started to investigate the dynamic nature of our findings as ChiNext matured over time. However, the short time frame and the focus on a single stock market limit the depth of this investigation. Nevertheless, our findings provide

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important first evidence and guidance for future research. Such research should consider both extended longitudinal and international comparative designs (Child, 2009).

Third, we identified institutional affiliation as an important factor explaining some above-normal investment returns. Data availability prevented direct observations of negotiation processes between the entrepreneurs and investors with such affiliations. Future investigations based on surveys or case studies could reveal more about these underlying processes. For example, how do institutional affiliation factors enter into and affect investment negotiations? Another interesting research direction is examining whether market participants' expectations about the advantages of VC institutional affiliations are actually met. For example, are the corresponding IPO processes implemented in a more timely and effective manner? And do these affiliations actually increase post-IPO performance? Addressing these questions will advance the research on emerging stock markets.

CONCLUSION

How do entrepreneurs respond to immature regulatory institutional environments in order to get listed on emerging stock markets? Our answer is that they pay institutional premiums to the VC investors who may help them access the highly controlled IPO markets. This will lead to higher investment returns in pre-IPO deals than those at earlier stages, which distorts the risk-return tradeoff found in developed markets. Moreover, government-affiliated VC investors can obtain even higher investment returns from their pre-IPO deals. The additional institutional rents, however, decrease as the stock markets mature. Our findings highlight that institutional factors can have different impacts on the behavior of participants in emerging markets than in developed markets where the market access is open and often taken for granted. This study calls for more research applying an institutional-based view to understand entrepreneurs' behavior in emerging stock markets.

NOTES

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APPENDIX

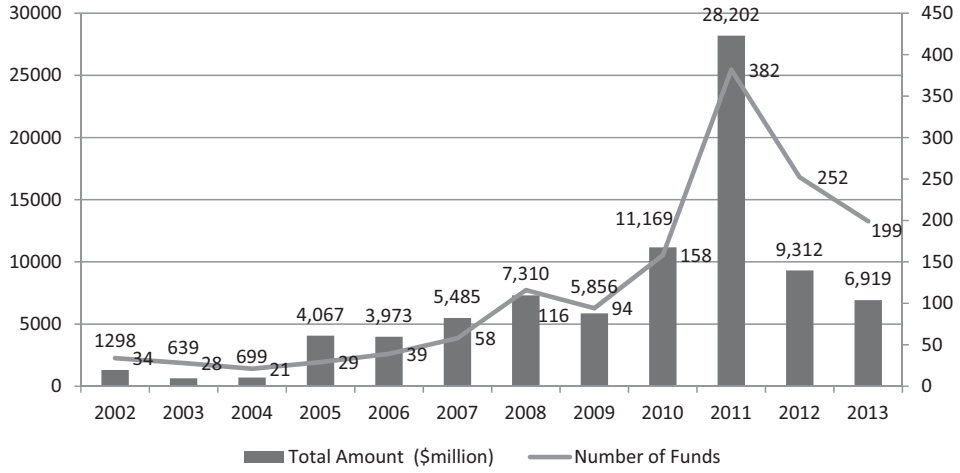

Figure 1. Newly raised VC funds in China (2002–2013).
Source: Zero2IPO (2014). Review of the VC/PE Market for January–June 2014.

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