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Political Ties and Venture Capital: Evidence from China

A thesis presented in fulfilment of the requirement for the
degree of
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“Eventually everything connects - people, ideas, objects. The quality of the connections is the key to quality per se”

–Charles Eames

ABSTRACT

This thesis investigates whether venture capital firms (VCs) benefit from political ties (PTs), and whether VCs add value to China's public equity market by constraining earnings management (EM) and improving corporate governance of their backed firms. The first essay examines whether PTs facilitate VCs' successful exits via either initial public offerings (IPOs) or merger and acquisitions (M&As). Using a sample of 2578 Chinese portfolio firms that received their initial VC funding during 2004-2010, this essay shows that PTs increases the likelihood of VCs' successful exit through mainland stock markets and M&A markets. It further shows that VCs with management-level PTs enjoy greater success than those with ownership-level PTs, whereas no significant difference between central and local government PTs on VC exits.

The second essay examines whether VCs with PTs are better able to constrain opportunistic earnings management (EM) in Chinese IPO markets. It shows that IPOs backed by VCs with ownership-level PTs are more likely to conduct opportunistic IPO-year EM, while those backed by VCs with management-level PTs are associated with lower IPO-year EM. The higher EM in IPOs backed by VCs with ownership-level PTs is mainly driven by VC lock-up sale within six months following VC lock-up expiration, while the lower EM in IPOs backed by VCs with management-level PTs is not significantly associated with VC lock-up sale. Lastly, IPOs subject to immediate exits from VCs with ownership-level PTs exhibit poorer post-issue stock performance, while

IPOs backed by VCs with management-level PTs exhibit better post-issue stock performance regardless of VC lock-up sale.

The final essay investigates how VCs influence the size and composition of corporate boards. Using hand-collected data from 924 IPO prospectuses, this essay shows that VC-backed IPOs have more independent boards in China. Furthermore, VCs with management-level PTs improve governance by using their networks to recruit specialist independent directors with industry relevant expertise. Lastly, this essay shows that IPOs with more independent boards are not necessarily associated with better performance. However, IPOs backed by VCs with management-level PTs and firms that have a larger percentage of independent directors with industry relevant expertise exhibit higher long-term stock returns.

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CHAPTER ONE

INTRODUCTION

“Institutions are the rules of the game in a society...They are a guide to human interaction, so that when we wish to greet friends on the street, drive an automobile, buy oranges, borrow money, form a business, bury our dead, or whatever, we know (or can learn easily) how to perform these tasks. We would readily observe that institutions differ if we were to try to make the same transitions in a different country-Bangladesh for example. In the Jargon of the economist, institutions define and limit the choices of individuals.”

North, Douglass (1990, pp1-2)

This chapter presents the overall motivation for, and an overview of, the thesis. Specifically, it first outlines the background and motivation. Then it provides an overview and highlights the contributions of each of the three essays. The chapter concludes with an outline of the thesis organisation.

1.1 Background and motivation

Venture capital (VC) is a predominant source of capital for young and innovative entrepreneurial firms. Referred as the ‘money of invention’ (Barry, Muscarella, Iii, and Vetsuypens, 1990; Black and Gilson, 1998; Gompers and Lerner, 2002), VC is an important driver for economic growth. Many of today’s prominent firms, such as Microsoft, Google, Facebook, Intel, and Starbucks, were funded by VC firms in their early stages and grew from fledgling entities to large multinational corporations. Besides providing capital, VC firms employ their expertise and experience to guide and provide value-added services such as networking, human resource management, and post-investment monitoring and advising (e.g., Amit, Brander, and Zott, 1998; Hellmann and Puri, 2002; Gompers and Lerner, 2002).

Driven primarily by the US success in utilizing VC to facilitate innovation and economic growth (Gilson, 2003), the Chinese government attempted to promote VC to support start-ups and foster innovation in the mid-1980s. China's VC industry experienced sluggish development in its first 10 years. With continued support from the Chinese government and the private sector, it has grown rapidly since the late 1990s. In the early 2000s, foreign VCs¹ dominated the market and accounted for over 80 percent of the amount of VC investment and divestment (Ahlstrom, Bruton, and Yeh, 2007). Facilitated by the relaxed regulations on domestic institutional investors investing in VC funds and establishment of additional stock market exit routes (SME Board in 2004 and Venture Board² in 2009), domestic VCs have grown rapidly and now dominate the majority of the China market³ (Lu, Tan, and Huang, 2013). Statistics by Ernst and Young (2011) show that China's total amount of VC investments increased from approximately US \$1 billion in 2003 to US \$13 billion in 2011, becoming the second largest following that in the US.

However, a general consensus among academics and practitioners is that there exist dramatic differences on the way VC activities are conducted in China as opposed to the US (e.g., Bruton and Ahlstrom 2003; Tan, Zhang, and Xia, 2008; Lu, et al., 2013). These authors attribute the behavioural differences to the divergent structure of regulatory, normative, and cognitive institutions in China (e.g., Wright, Pruti, and

¹ In this thesis, a foreign VC is defined as one with its headquarters located outside the Mainland China.

² The SME Board is a small component of the Shenzhen Stock Exchange. It was designed to facilitate financing of mature SMEs with established track records. This Board is not a NASDAQ-type market. The Venture Board, also called the ChiNext Board, provides formal exits to VC firms and aims to help financing of innovative and fast-growing entrepreneurial firms.

³ According to a recent Lux Research report (2011), foreign VCs have out invested their domestic counterparts by 2 to 1 in terms of the total investment amount in both Shanghai and Beijing. However, domestic VC investments dominate by 5-to-1 in the highly active provinces of Jiangsu and Zhejiang. In the rest of the country, domestic VCs are seeing more opportunities and acting accordingly.

Lockett, 2002). For example, in developed economies where market-supporting institutions are available, uncertainties of investing in an entrepreneurial firm typically come from either industry-level conditions or firm-level agency problems. VCs can earn economic rents by carefully screening and evaluating projects and providing assistance to enhance the competitiveness of their investees. However, it is difficult to apply the mainstream VC theories to less developed economies where there is a lack of market-supporting institutions. For example, intellectual property protection, government intervention, supply of risky capital, shareholder protection, transparency of financial reporting requirements, and IPO markets for exits are matters of tremendous concerns to VC investors (Jeng and Wells, 2000; Lu et al., 2013). Hence when financing an entrepreneurial firm in an emerging market, VCs are exposed to not only industry- and firm- level uncertainties, but also the legal and institutional failure which cannot be easily controlled (Tan, Huang, and Lu, 2013).

While prior research argues that VCs rely heavily on a stable institutional system with a predictable rule of law and enforcement regime to facilitate and safeguard their investments (e.g., Ahlstrom and Bruton, 2006; Cardis et al., 2001; Cull and Xu, 2005;), many less developed and emerging economies with deficient formal regulatory institutions have witnessed a dramatic increase in their VC investment amount (e.g., Dai, Jo, Kassicieh, 2012; Humphery-Jenner and Suchard, 2013a; Zhou, 2009). Whereas a number of justifications may be offered, such as robust economic growth and thus large demand for consumers goods (e.g., Hoskisson, Eden, Lau, and Wright, 2000), one key may be informal social arrangements such as social network ties (Peng and Luo, 2000; Peng, 2003; Zhou, 2013). Recent literature in new institutional economics suggests that informal social network ties can have consequences as important and long-lasting as

those of formal legal systems (Dixit, 2004). One type of such social networks is political ties (PTs), which have become an increasingly popular topic in entrepreneurial research (e.g., Faccio, 2006; Siegel, 2007). It has been argued that PTs can not only facilitate access to key information and resources, but help entrepreneurs in other aspects of conducting business (particularly property rights protection) under deficient formal legal systems (e.g., Shi, Markoczy, and Stan, 2014; Zhou, 2013).

China's emerging capital market provides an ideal institutional environment to study the importance of VCs' political ties on entrepreneurial investments. First, despite weak legal institutions, China's VC industry has experienced significant growth during the last decade and is now the second largest in terms of total amount of VC investments (Ernst and Young, 2011). PTs may facilitate entrepreneurial investment by providing property rights protection and keeping the fruit of entrepreneurs' investment from predatory behaviours of the government and its agents (Zhou, 2013). Second, China's capital markets remain strictly regulated where the government controls critical information and resources (Chen, Li, Su, and Sun, 2011; Shi et al., 2014). For example, the China Securities Regulatory Commission (CSRC), an authority of the Chinese government, retains residual discretion to approve a new issue in Chinese stock markets. Moreover, entrepreneurial firms are discriminated against for accessing bank loans since China's banking system is still under strict government control (Chen et al., 2011). Third, the majority of domestic VC investors are either government-controlled⁴, with natural connections with governments, or have an executive with strong personal connections with the government (Liu et al., 2013). Lastly but not the least, the business

⁴ In this thesis, government-controlled VCs and VCs with ownership-level PTs are used interchangeably.

environment in the Chinese market is dominated by connections and networks rather than a formal legal system (e.g., Peng, 2003).

Although prior research shows that listed companies benefit from PTs in various forms⁵, to the best of my knowledge, there is no study on whether VCs benefit from PTs. The findings regarding the positive impact of PTs on listed companies may not be generalizable to VCs. On one hand, as more frequent players in the market, VC reputation is crucial to their survival and growth (e.g., Nahata, 2008). Similar to audit firms, VCs may experience a significant reputational loss if they engage in severe rent-seeking activities (Yang, 2013). On the other hand, PTs may be more beneficial for VCs due to the unstable institutional environment and strong government influence in transitional economies. Compared to public firms, VCs count more heavily on a stable institutional regime and efficient markets for corporate control and capital which readily allow exit from their investments (Wright, Thompson, and Robbie, 1998). PTs may act as an effective mechanism to reduce uncertainty and substitute for formal institutional support⁶ (Xin, and Pearce, 1996; Wu, Li, Li, 2013). Thus, it is unclear whether the benefits extracted from PTs surpass the costs associated with such ties for VC firms. To shed light on this question, the first research aim for this thesis is as follows:

Research Aim 1: To investigate whether VCs benefit from PTs in the transitional and emerging market of China, where government influence is strong and market-supporting institutions are underdeveloped.

⁵ Firms with PTs enjoy a variety of benefits, including timely access to policy and aggregate industrial information, relaxed regulatory oversight, access to scarce resources, and improved legitimacy (e.g., Sun et al., 2012; Shi et al., 2014).

⁶ Formal institutions in this thesis represent laws and regulations which are underpinned by regulatory pillar.

The first essay of this thesis addresses Research Aim 1 by examining the impact of PTs on the likelihood of VCs' successful exits. Prior research finds that VCs generate the majority of their returns⁷ from the sub-sample of their investments that exit either through IPOs or M&As (e.g., Cumming and MacIntosh, 2003; Nahata, 2008). The development of VC industries has proved to be a challenge in many emerging economies as these economies are undergoing significant economic transition and provide relatively little protection for either investors or private property (Peng, 2003). Such an uncertain environment adds to the already difficult task encountered by VC investors in selecting and monitoring their investments (Bruton and Ahlstrom, 2003; Pruthi, Wright and Lockett, 2003). As such, how do VCs survive and even thrive in transitional economies that lack developed market-institutions necessary to support VC investing? This essay hypothesizes that PTs are able to help VCs overcome the underdeveloped institutional environment by facilitating VCs' successful exits, which in turn improve VC returns.

Given VCs' early involvement in the strategic development of the entrepreneurial firms, VC investors may have a particular strong impact on the process of their portfolio firms going public (Carpenter, Pollock, and Leary, 2003). How VCs affect the management decisions of their portfolio firms is unclear in a transitional and emerging market. Further, while PTs created by executives of large listed firms are widely documented in previous studies (e.g., Fan, Wong, Zhang, 2007; Chen et al., 2011), the impact of PTs brought in by entrepreneurial firms from external sources is less examined. For entrepreneurs, the benefits of investors with strong ties are evident in China (Bloomberg Business, 2012), whereas VC investors are the most popular and

⁷ Ideally, this study would measure performance directly by using the rate of returns VC firms achieve over their life. However, such returns are usually not publicly available, as VCs only disclose performance to their investors.

easiest to approach for young innovative start-ups which have significant level of intangible capital (China Business Review, 2009). Given the booming of China's VC market and private sector, it is important to examine whether and how VC investors, particularly those with PTs, add value to the public equity market. This motivates the second key research aim of the thesis:

Research Aim 2: To investigate whether VCs, particularly those with PTs, add value to China's public equity market.

To meet the second research aim, this thesis investigates whether VCs, particularly those with PTs, add value to China's public equity market by constraining earnings management (EM) decisions of public firms in essay two; and whether VCs affect the corporate governance of their backed firms in essay three. Specifically, essay two attempts to examine how China's institutional environments change the governance role of VCs in the context of potential manipulation of earnings information provided to the outside investors. This essay conjectures that different types of VCs impact differently on EM due to their different incentives and motivations. While prior developed market research finds that VCs add value by improving board structure of entrepreneurial firms, whether VCs are able to play a similar role is unclear in an emerging market where ownership tends to be more concentrated and investor protection tends to be weaker. Essay three attempts to fill this gap by presenting a comprehensive study on the role of VCs in board structure of Chinese IPO firms.

The remainder of this chapter is structured as follows. Section 1.2 provides a brief overview for each of the three essays in order. Section 1.3 highlights the contribution,

and Section 1.4 presents research outcomes. Section 1.5 summarizes the structure of the remainder of the thesis.

1.2 Overview of the three essays

1.2.1 Essay one: Political ties and VC exits: Evidence from China

The first essay of this thesis investigates whether VCs benefit from PTs in the transitional and emerging economy of China. Specifically, it examines whether PTs facilitate successful exits of VC investments via IPOs and M&As, since VCs generate the majority of their returns through exiting their investments (e.g., Cumming and MacIntosh, 2003). In addition, this essay examines whether the impact of PTs varies across different types (ownership- and management-level ties) and compositions (central and local government ties).

Using a sample of 2758 portfolio firms that receive initial VC funding during 2004-2010, this essay makes the following key findings. First, it shows that PTs facilitate the likelihood of an IPO exit via mainland stock markets and an M&A exit. The evidence is consistent with the corporate PTs literature that PTs facilitate entrepreneurial investment in a market where market-supporting institutions are less developed and government influence is strong. Second, management-level ties have greater positive effects on VC exits than ownership-level ties. This result echoes with Faccio (2006) and Sun, Mellahi, Wright, and Xu (2011) who use an event study approach to demonstrate that ownership- and management-level PTs impact differently on firm value. Lastly, there is no different impact between central and local government PTs on VC exits. This is inconsistent with Wu et al. (2013) that central PTs have greater positive effects than local PTs. One possible reason is that Chinese firms rely less on the central government for resources

after the redistribution of economic decision-making powers between the central and local governments. The overall results of this essay remain stable after using the instrumental variable (IV) and propensity score matching (PSM) approaches to address the endogeneity concerns and selection bias.

1.2.2 Essay two: VC political ties and earnings management: Evidence from China

The second essay examines whether VCs with PTs add value to the public equity market by constraining the IPO-year earnings management (EM) of their portfolio firms in China. VCs with PTs enjoy a greater number of successful exits (see essay one) and thus are often considered as more reputable than their non-connected counterparties. Recent studies show that managers' discretion is affected by the presence of VC investors (Cumming, Siegel, and Wright, 2007), and VC-backed IPOs, especially those backed by reputable VCs, have significantly lower EM than non-VC-backed IPOs in developed markets (e.g., Morsfield and Tan, 2006; Lee and Masulis, 2011; Wongsunwai, 2013). Consequently, this essay asks: do VCs with PTs that are considered as more reputable in a transitional market play a better monitoring role? Or are they more reputable simply because of their PTs which facilitate successful exits?

This essay investigates the role of VCs with different types of PTs (ownership- and management-level PTs) in constraining IPO-year EM for Chinese entrepreneurial firms. Using a sample of 924 entrepreneurial firms listed on the SME and Venture Boards during 2004-2012, this essay shows that IPOs backed by VCs with ownership-level PTs exhibit more income-increasing IPO-year EM than other IPO issuers. In contrast, companies backed by VCs with management-level PTs show less opportunistic EM. Further, the higher IPO-year EM in government controlled VC-backed IPOs is mainly

due to the lock-up sale within six months following the lock-up expiration. However, the lower EM associated with IPOs backed by VCs with management-level PTs are not significantly associated with the lock-up sale. Lastly, this essay finds that IPOs backed by VCs with ownership-level PTs, especially those subject to VC lock-up sale, exhibit poorer long-run stock performance; whereas IPOs backed by VCs with management-level PTs exhibit better post-issue stock performance regardless of VC lock-up sale. The overall results are robust to different EM measures (cross-sectional modified Jones and performance matched abnormal accruals) and the endogenous choice of VC backing (two-step and PSM approaches).

1.2.3 Essay three: The impact of VC backing on the corporate governance of Chinese initial public offerings

The final essay investigates whether VC investors add value to the public equity market by improving the board structure of their backed IPOs in China. Prior studies in developed economies document that VC-backed IPOs have a better board structure, with fewer insiders and quasi outsiders and more independent directors⁸ (Baker and Gompers, 2003; Suchard, 2009). However, very little is known about whether VC investors are able to monitor and provide expertise in less developed markets, where ownership tends to be more concentrated and agency problems tend to be more severe due to weaker investor protection (e.g., La, Porta, Lopez-De-Silanes, and Shleifer, 1999).

With hand-collected data from 924 IPO prospectuses, this essay shows that Chinese VC-backed IPOs in general have fewer (more) non-independent (independent) directors.

⁸ In this essay, outside and independent directors are used interchangeably.

The percentage of independent directors is 12% larger in firms backed by venture capital. In addition, firms backed by VCs with management-level PTs have more independent directors with industry relevant expertise than other firms. The results hold when controlling for the CEO and firm characteristics, ownership variables, and the endogeneity of VC financing. While no significant relationship is found between board independence and firm performance, this essay provides some evidence that firms with a higher percentage of independent directors with industry relevant expertise have better performance, and VCs with management PTs improve IPO performance.

1.3 Contribution

This thesis contributes to both the VC and corporate PTs literature. Prior empirical studies mainly focused on developed VC markets, particularly the US market. The role of VCs remains relatively underexplored in transitional markets, where market-supporting institutions are underdeveloped and government interference is frequent. In such markets, PTs may act as an effective mechanism to mitigate political and economic risks and substitute for formal institutional support for VC firms. This thesis uses hand-collected data on VC firms to draw insights into the role of PTs in VCs' exit activities. It also sheds light on how institutional environment of a transitional economy shapes the role of VCs, particularly in the context of earnings reporting and board structure of their backed firms.

Specifically, the first essay of the thesis extends the VC and PTs literature by examining whether PTs bring benefits to VC firms in China. Previous studies have mainly focused on the value of PTs in a firm's access to financial markets or linked PTs to firm value. Although a few recent studies have investigated the effect of PTs on the

probability of IPO approval and performance⁹, the value of PTs on successful exits of VC investments has never been investigated. To the best of knowledge, this is the first study to examine the impact of PTs on VC performance. The findings of this essay show that PTs increase VC returns through facilitating successful exits via mainland IPO and M&As. Due to the young VC industry and the absence of predictable rules of law and enforcement regimes, VCs divert their resources to build and maintain PTs, so as to reduce uncertainty and capture economic rents from China's institutional environment. Further, this study adopts a contingency perspective by empirically testing the impact of different types and compositions of PTs on VC exit outcomes. Though extant studies recognize the existence of different strengths and structure of PTs (Sun, Mellahi, and Wright, 2012), there has been a lack of empirical research testing their divergent values on VC exits. Third, this essay sheds light on the determinants of domestic VC exits in a transitional and emerging market, whereas prior studies primarily focus on cross-border VC investments into emerging markets (e.g., Dai et al., 2012; Wang and Wang, 2011), and whether the presence of foreign VCs increase the likelihood of a successful exit (Humphery Jenner and Suchard, 2013a).

The second essay also provides several important contributions to the existing body of VC and PTs literature. First, to the best of knowledge, this is the first study that examines the role of VCs in affecting EM decisions of IPO issuers in a transitional market. How the institutional environment of an emerging market affects the governance roles of VCs in the context of potential earnings manipulation is unclear in

⁹ Liu et al. (2013) use 751 IPO applications and find that firms with PTs gained from executives, politically connected sponsors and private equity investors are more likely to obtain IPO approval from the CSRC. Francis, Hasan, and Sun (2009) use a sample of 423 IPOs during 1994-1999 and show that politically connected firms obtain a higher offer price than non-politically connected firms. Fan et al. (2007) find that politically connected IPOs underperform, and they focus mainly on PTs in state-controlled firms. Liu et al. (2012) and Wu et al. (2013) show that politically connected IPOs outperform non-connected IPOs in the long term using a sample of both state-controlled and non-state-controlled firms.

the VC literature. Second, this essay extends the PTs literature by examining the role of government-controlled VCs and private-controlled VCs with management-level PTs in affecting IPO issuers. While the existent literature on the government's role in VC has mainly focused on government-supported VCs¹⁰ in developed markets (e.g., Lerner, 1991; Leleux and Surlemont, 2003; Brander, Egan, and Hellman, 2008), the role of direct government ownership and management-level PTs in monitoring management decisions of IPO issuers remains relatively underexplored. Third, this essay provides some evidence regarding the impact of the lock-up restrictions on IPO-year EM. The results suggest that the lock-up sale within six months following VC lock-up expiration is one of the key factors leading to the higher EM in government-controlled VC-backed IPOs.

The final essay of this thesis extends developed market evidence by examining the impact of VC investors on board structure of their backed firms in China. It sheds light on the contribution of VCs to corporate governance practice in an emerging market where ownership is concentrated and investor protection is relatively weak. Furthermore, this essay contributes to the existing literature by linking VC backing with the knowledge and connection building of the board. It shows that VCs with management-level PTs and independent directors with relevant industry expertise contribute to better performance. Lastly, unlike previous studies on board structure of Chinese listed firms (e.g., Liu, Miletkov, Wei, and Yang, 2015; Jiang and Kim, 2015), this essay uses a refined measure of independent directors. Rather than just using the independent directors documented in the IPO prospectuses, this essay further include directors that

¹⁰ Government-supported VCs are privately-owned, but obtain significant financing, tax credits, and other subsidies from the government (Brander, Du, and Hellman, 2015).

are not related to the controlling shareholders or management directors, were/are not employees, and have no business dealing with the IPO firm as independent directors.

1.4 Research output from the thesis

Essay one, “Political ties and VC exits: Evidence from China”, presented at

- Online Workshop on Venture Capital and Private Equity in the Asia-Pacific (Held by UNSW) in November 2013
- New Zealand Financial Colloquium in AUT in February 2014 (where the paper was awarded the best PhD paper prize by the Auckland Centre for Financial Research)
- FMA Asia in Japan in April 2014
- SIRCA Young Research Workshop 4 in Sydney in July 2014

Essay two, “VC political ties and IPO earnings management: Evidence from China”, presented at

- New Zealand Finance Colloquium at Waikato University in February 2015
- The School of Economics and Finance Seminar at Massey University in February 2015

1.5 Structure of the thesis

The remainder of this thesis is outlined as follows. The first essay that investigates the impact of PTs on VCs’ successful exits is presented in Chapter 2. Chapter 3 discusses the second essay, which provides evidence on whether VCs with PTs play a monitoring role in constraining EM in China. Chapter 4 presents the third essay, which

examines whether VC investors improve corporate governance of Chinese IPOs. Chapter 5 outlines the key findings, as well as the implications which may provide future research directions. The supplementary information such as variable definition, correlation matrix, and further robustness tests are presented in the Appendices.

CHAPTER TWO

ESSAY ONE

This chapter presents the first essay which investigates whether PTs add value to VCs by facilitating VCs' successful exits via IPOs and M&As. It also examines whether the impact of PTs on VC exits varies across different types and compositions. A brief overview of the study is presented in Section 2.1. Section 2.2 presents the institutional background, literature review, and hypotheses development. Section 2.3 describes the data sample. Section 2.4 discusses the empirical results, while Section 2.5 concludes this essay. The chapter's appendices and references are presented in Appendix A and the Reference sections, respectively.

Political ties and VC exits: Evidence from China

Abstract: This study examines whether political ties (PTs) benefit VCs in China and finds a positive relationship between PTs and successful VC exits. The findings indicate that PTs are crucial for VCs to exit via Chinese mainland stock markets and M&As. The impact of PTs depends on the nature and compositions of PTs. VCs with management-level PTs enjoy greater success than those with ownership-level PTs while no significant difference is found between central and local government PTs. The results remain stable after controlling for endogeneity concerns, selection bias, alternative measures for VC exits, and different institutional environments across regions.

Keywords: Venture Capital Exits; Political Ties, Transitional Economy, China

JEL classification: G24; G34

2.1 Introduction

VC investing is a recent but rapidly increasing trend in less developed markets (Lockett and Wright, 2002). While emerging markets like China and India have experienced rapid growth in VC investments (Dai et al., 2012; Ernst and Young, 2011), their VC industries lack a stable institutional environment enjoyed by VCs in developed markets (Ahlstrom and Bruton, 2006). This begs the question; how do VCs survive and even thrive in less developed economies that lack established institutions necessary to support VC investing? This study shows that political ties (PTs) benefit VCs in the transitional and less developed economy of China. In addition, it investigates whether the impact varies across different types and compositions of PTs.

An investigation of the value of PTs on VCs is worthwhile for the following reasons. First, PTs are likely to enable VCs to overcome deficient formal regulatory institutions (Bruton and Ahlstrom, 2003; Xin and Pearce, 1996). Prior research has focused on the role of established formal institutions such as predictable rules of law and private property rights in facilitating the development of entrepreneurial investments (e.g., North, 1990; 2005; Ahlstrom and Bruton, 2006). However, emerging markets have recently exhibited increased VC development despite their underdeveloped legal systems and ambiguous property rights (Dai et al., 2012). Examining PTs of VCs will help to further the understanding of how institutional environments affect VC incentives and activities in less developed economies.

Second, although prior research shows that PTs add value to listed companies in various forms, these findings may not be generalizable to VCs. As “repeat players” in the market, VC reputation is crucial to their survival and growth (e.g., Nahata, 2008).

Similar to audit firms, VCs may incur a significant reputational loss if they are found to engage in severe rent-seeking activities (Yang, 2013). On the other hand, PTs may be more beneficial for VCs due to the inadequate legal infrastructures to facilitate and safeguard their investments in less developed economies. Thus, it is unclear whether the benefits extracted from PTs surpass the costs associated with such ties. In addition, while a contingency perspective of corporate PTs assumes that the impacts of PTs on firm outcomes depend on its strength and structure, there is a lack of empirical studies examining the divergent value of different PTs, especially on VC success (Sun et al., 2012; Wu et al., 2013).

China provides an ideal situation to study the importance of VCs' political ties for several reasons. First, despite weak legal and market institutions, China's VC industry has experienced significant growth during the last decade and is now the second largest in terms of total amount of VC investments (Ernst and Young, 2011). Second, the positive impacts of PTs may be more evident since entrepreneurial firms are often discriminated against obtaining resources controlled by the Chinese government (e.g., Li et al., 2008). Regardless of the advancements in the marketization process, the Chinese government still dominates the allocation of resources such as licensing, the granting of land uses, the control of access to financial capital (Shi et al., 2014; Chen, et al., 2011). Third, government intervention remains prevalent in the Chinese stock market. The highly regulated IPO process and the requirement of the CSRC's approval for IPO listing may enable VCs with PTs to liaise more effectively with the regulators (Liu et al., 2013). Last but not the least, the co-existence of different types and compositions of PTs in China offers a suitable context to test the contingent value of PTs on VC exits (Wu et al., 2013; Zhou, 2013). As noted by a number of researchers

(e.g., Faccio, 2006; Okhmatovskiy, 2010; Sun et al., 2012), the value of PTs may be contingent on the type (management- and ownership-level ties) and composition (central and local government ties) of PTs.

Building on the institutional theory and corporate PTs literature, we first examine the role of PTs in VC success in terms of exiting through IPOs and M&As. We find evidence consistent with PTs facilitating successful VC exits in a transitional economy. Specifically, using a sample of 2578 Chinese portfolio firms that received initial VC funding during 2004-2010, we find that PTs facilitate the likelihood of an IPO exit via mainland stock markets and an M&A exit. Second, management-level ties have greater positive effects on VC exits than ownership-level ties. The results complement the work by Faccio (2006) and Sun et al. (2011) who demonstrate that ownership- and management-level PTs impact differently on firm value by using an event study approach. However, we find no different impact between central and local government PTs. This may be due to the decreasing dependence of firms on the central government for resources after the redistribution of economic decision-making powers between central and local governments.

This study contributes to the literature in several important ways. First, to the best of knowledge, this is the first paper to examine the impact of PTs on VC success. We use a comprehensive sample of Chinese VC investments to draw insights about the role of PTs in venture success within a transitional and less developed economy. Second, this study sheds lights on the impact of direct government ownership and management-level PTs on VC exits. Prior studies have primarily focused on government-supported VCs in developed markets (e.g. Leleux and Surlemont, 2003; Cummings and Johan,

2013). To the best of knowledge, this is the first study on the relative performance of ownership- and management-level PTs. Understanding how different types of PTs modify the presumably beneficial performance effect is important, especially considering recent arguments that PTs can negatively impact firm value (e.g. Fan et al., 2007). Third, this study sheds lights on the determinants of domestic VC exits in a transitional economy, whereas prior studies focus either on cross-border VC investments into emerging markets (e.g., Dai et al., 2012; Wang and Wang, 2011) or whether the presence of foreign VCs increase the likelihood of a successful exit (Humphery-Jenner and Suchard, 2013a). Humphery- Jenner and Suchard (2013a) show that foreign VC backing do not per se increase the likelihood of a successful exit, and compared with domestic VCs, foreign VCs prefer to exit via M&As or secondary sales than via an IPO in China. Our study shows that PTs are one of the key factors that affect the likelihood of an IPO exit for domestic VCs.

The remainder of this study is organised as follows. Section 2.2 presents the institutional background, literature review, and hypothesis development. Section 2.3 presents the data, variables, and methodology. Section 2.4 presents the multivariate results, while the final Section 2.5 presents the concluding remarks.

2.2 Institutional background, literature review, and hypotheses development

2.2.1 Institutional background

China has experienced remarkable economic growth during its process of transforming from a centrally-controlled system to a more market-oriented economy. Unlike the more natural development of Western market economies, the state plays the leading role in constructing China's market economy (Nee, 2005). Since the legal

system was almost non-existent, the state has relied heavily on its pre-existing administrative bureaucratic system to lead the market-oriented reforms. The administrative bureaucratic system in China refers to “the central government and its organs, local governments, and the interactions among the central government, central government organs, local governments and private parties and the ruling party” (Wu, 2007, p751). As the reform went on, both central and local governments, as the main actors of the bureaucratic system, went through decentralization and redistribution of decision-making powers. In recent years, Chinese administrative bureaucratic system has improved significantly as compared to the previous decade in terms of managing office work by rules of law. However, the system is still criticized for “its interpersonal network and clientelism” (Wu, 2007, p752).

Another characteristic is frequent government intervention in China’s capital markets. Under the merit review regime in China, government authorities retain ultimate decision-making power in the IPO process. Specifically, all IPO candidates must obtain the CSRC’s final approval to access funds from the mainland stock markets. Although the Chinese government has promulgated laws and regulations to guide the IPO selection, the legislation contains a number of qualitative and ambiguous criteria (Yang, 2013). In addition, the Chinese authorities promulgated the “M&A rules”, which impose the requirements of obtaining government authorities’ approval for cross-border M&A deals and overseas listings. The rationale behind this action was the government’s intention to keep valuable domestic assets listing on its own stock markets. However, these requirements also give government officials a great amount of discretion in their decision making (Liu et al., 2013).

China's VC market was established in the mid-1980s with foreign VCs initially dominating the market. Facilitated by the relaxed regulations on domestic institutional investors investing in VC/PE funds and creation of additional stock market exit routes (SME and Venture Boards), domestic VCs has grown rapidly and now dominated China's VC market (Lu et al., 2013). In the US where formal institutions are mature, VCs can employ traditional VC mechanisms and reduce agency costs by carefully screening, evaluating and providing assistance to their portfolio firms (Amit et al., 1998). In China, however, intellectual property and investor protection, government intervention, IPO markets for exits are still matters of tremendous concerns to VC investors (Jeng and Wells, 2000; Lu et al., 2013). Under such circumstances, institutional theorists highlight the importance of social network ties in entrepreneurial activities (e.g., Xin and Pearce, 1996; Peng and Luo, 2000). Compared to other types of social network ties (e.g., inter-firm and interpersonal ties), the value of PTs should be greater in China, since firms continue to depend on the government for critical information and resources despite the progress in its marketization process (Shi et al., 2014).

While businesses still depend on the government to gain critical resources and legitimacy, the government also benefits from ties with managers (Dickson, 2003). Shi et al. (2014) argue that the nature of PTs has transformed from asymmetrical, one-way relationship to a more symmetrical, two-way relationship during the economic transition. The government relies on the success of local firms to fulfill both financial and political goals. In addition, the government counts increasingly on ties with managers to determine and implement economic policies and attract firms to knowledge-intensive sectors.

2.2.2 Literature review and hypotheses development

Since Krueger's (1974) seminal work, numerous attempts have been undertaken to estimate the value of PTs. It has been shown that politically connected companies are more likely receive preferential access to bank loans (e.g., Chen et al., 2011; Zhou, 2009), preferential treatment by state-owned enterprises (Backman, 1999), relaxed regulatory oversight (Li and Zhou, 2015), and tax breaks or even government bailouts at hard times (e.g., Li et al., 2008; Siegel, 2007). There is also evidence in the literature that PTs destroy firm value. For example, Cheung, Jing, Raghavendra, Stouraitis (2005) and Fan, Wong, and Zhang (2007) show that PTs are detrimental to minority shareholders, a conclusion that is consistent with Shleifer and Vishney (1994)'s 'grabbing hand' model of government. Johnson et al. (2000) find that in countries where corruption is high, firms are more likely to hide output so as to reduce appropriation. Okhmatovskiy (2010) argue that firms with PTs experience significant constraints and costs associated with government official's involvement in the corporate governance process.

China's fast economic development has not been coupled with political liberalization and the government remains firmly in control of information and resources (Chen et al., 2011; Shi et al., 2014). In such an economy, the benefits associated with PTs are more likely to outweigh the costs (e.g., Sun et al., 2012; Shi et al., 2014). Peng and Luo (2000) argue that the positive effects of PTs are greater for private and smaller firms than their state-owned and larger peers, because resources obtained from PTs are more valuable for the former group due to the significant liabilities of newness, smallness, and privateness in transitional economies. Zhou (2013)

shows that PTs facilitate entrepreneurial reinvestment through better property rights protection. Liu, Luo, and Tian (2015) show that connections with government officials enable Chinese non-SOEs to increase their M&A activities, merge more local targets, and pay less M&A premium. In the similar vein, VCs with PTs are likely to obtain these invaluable resources, and thus enjoy greater success.

In addition, China's IPO regulatory process is often subject to lobbying and political influence (Aharony, Lee, and Wong, 2000; Hung, Wong, and Zhang, 2012). Under China's merit review regulatory regime, the government is a critical determinant of the accessibility of stock markets to individual companies (Huang, 2011; Li and Zhou, 2015). As VCs generate most of their returns from successful exits via IPOs in China¹¹ (Ernst and Young, 2011), they have strong incentives to help portfolio firms succeed in the IPO screening process. VCs with PTs may help obtain valuable insights into the IPO regulatory process through their ties with the government authorities, and help their portfolio firms better prepare for IPO applications (Humphery-Jenner and Suchard, 2013a). Li and Zhou (2015) show that firms with PTs receive preferential treatments from regulatory authorities and are less likely to be selected for pre-IPO on-site auditing in Chinese mainland stock markets. Also, they are likely to lobby more effectively for favourable regulatory decisions on behalf of their portfolio firms (Yang, 2013).

¹¹ The administratively-controlled IPO process in China has led to an abnormally high IPO offer price and even higher secondary market price in its stock markets (e.g., Lu et al., 2013). The launch of the SME and Venture Boards provides an opportunity for VCs to join this IPO wealth creation campaign. For example, during the first half of 2010, the average capital gain achieved by the venture capitalists was nearly 15 times for IPOs conducted on the domestic stock exchanges. This is compared to a mean return of 2.82 times for IPOs conducted overseas during the same period (Zero2IPO, 2010).

While VCs with PTs may enjoy greater success in domestic markets, PTs may play a limited role in facilitating a successful exit via foreign stock markets. Foreign developed markets are typically well established and have strong regulations. VCs with PTs may not have institutional knowledge about foreign markets or connections with key intermediaries in that market who can navigate the international listing process. For example, Mata and Freitas (2012) find that entrepreneurial firms suffer from the liability of foreignness when attempting to raise capital in developed markets. Such problems could be especially severe for firms operating in poor information environments (Moore, Bell, and Filatotchev, 2010). Connections with top-tier lawyers, investment banks, and accountants, rather than with the government, should be more important for VCs to facilitate international listings (Humphery-Jenner and Suchard, 2013b).

Overall, the above discussion suggests that VCs with PTs may enjoy greater success in exiting their investments in China. Consequently, we hypothesize that:

H1: PTs facilitate successful VC exits, particularly through mainland IPOs and M&As.

The contingent perspective suggests that PTs are not uniform in their effects on firm performance, but rather vary across different types and composition of PTs (e.g., Sun et al., 2012; Wu et al., 2013).

Types of PTs. PTs can be classified into two types- ownership- and management-level ties (Faccio, 2006; Sun et al., 2011). The majority of VCs in China are either government-controlled, with natural connections with government, or have an executive with personal connections with the government (Liu et al., 2013). Most recent studies have focused on the direct government ownership on VC performance in developed markets. For example, Grilli and Murtinu (2014) use the VICO dataset and show that

private VCs are more effective than government-managed VCs in spurring the growth of portfolio firms in Europe. Based on the same database, Cumming, Grilli, and Murtinu (2015) find that private VC-backed companies have better exit performance than government-backed companies. Brander, Du, and Hellman (2015) examine firms funded by government-sponsored VCs in 25 countries and document a positive association between mixed government and private VC funding and VCs' successful exits. However, it is unclear whether these findings are generalizable to VCs in a transitional market that is often characterized by significant political and economic risks¹², which PTs might help to mitigate (Cao, Humphery-Jenner, and Suchard, 2013).

According to the political connections hypothesis (e.g., Chen et al., 2011; Li and Zhou, 2015; Liu et al., 2013), VCs with ownership-level PTs may have a competitive advantage relative to private VCs due to their inherent government connections. This would be especially the case in transitional economies where many important aspects of business operations are significantly influenced by various government agencies. However, the incentive hypothesis (Shleifer, 1998; Lerner, 2010) suggests that VCs with ownership-level PTs underperform private VCs due to the agency problems associated with direct government ownership. Such VCs are likely to be burdened with public or political objectives to support innovative start-ups whose risk and return prospects are not attractive (Zhang, Gao, White, Vega, 2008). Further, they are less likely to adopt high-powered incentive compensation contracts (Chen, Guan, and Ke, 2013; Ke and Wang, 2015). Therefore, managers might not have strong incentives to acquire private information to select or closely monitor their portfolio firms.

¹² Political and economic risks include the uncertainty in government regulations and the legal environment that will affect an investment.

Compared with VCs with ownership-level PTs, VCs with management-level ties aim primarily for profit maximization. Although they may not receive all the benefits enjoyed by VCs with ownership-level PTs (e.g., exemptions from regulatory requirements, less privilege to obtain government funds, and less likely to help firms gain legitimacy), VCs with management-level PTs are able to maintain autonomy and attenuate the inefficiencies and costs while still helping firms access other valuable resources (e.g., Okhmatovskiy, 2010; Chen et al., 2011; Liu et al., 2013). Thus, VCs with management-level PTs are likely to enjoy greater success as compared to VCs with ownership-level PTs. Consequently, we develop the following hypothesis:

H2: Ownership-level PTs have less positive effects on VC exits than management-level PTs.

Compositions of PTs. PTs can be classified into two levels- ties with the central government (central PTs) and ties with local governments (local PTs). Early studies find that central PTs have a more distinct impact on firm performance for two reasons (Qian and Li, 2010; Wu et al., 2013). First, central PTs confer more timely information and can transmit a stronger and more legitimate signal to other investors. Second, due to the hierarchical system in China, central PTs help firms obtain resources and administrative support from local governments. However, the ongoing reallocation of administrative power in China has empowered local governments to make the majority of economic decisions (Chen et al., 2011). Since central government's interest may not align with those of local governments, firms with central government ties may be unable to obtain critical resources controlled by local governments.

During the recent years of VC development, local governments have been major direct and indirect players in regional VC markets in China. In addition to establishing local government VCs, municipal governments such as Beijing, Shanghai, Tianjin, and Shenzhen have enacted local rules to support the establishment of VC funds, because new ventures were seen as contributing to the local economic development. The local government support includes relaxed formation procedures, tax reduction, cash bonus on the establishment, and lower capital requirements as specified by the central government (China Business Review, 2009). While VCs with central PTs may enjoy timely policy information, VCs with local PTs are likely to benefit from resources provided by the local governments. Consequently, the net effect of central and local PTs on VC success is not clear. In this study, we propose that local PTs have greater positive effects on VC exits:

H3: Local PTs have greater positive effects on VC exits than central PTs.

2.3 Data and variables

2.3.1 Data sources and statistics

Our data is mainly collected from the VC/PE database of the Wind Financial Terminal (Wind), one of China's leading financial data and solutions providers. We further cross-verify and supplement the data with the ChinaVenture, Licaicom, and Zero2IPO online sources¹³. Exchange rate data from Datastream is used to convert the foreign currency of IPO value into the Chinese currency. The sample includes VC

¹³A number of inconsistencies between various databases were found. For example, in some instances, the investment dates, number of VC firms syndicated in an investment, and establishment dates of portfolio firms documented in Wind differ from those in the Licaicom or the ChinaVenture database. In these instances, this study retains the data that is consistent across at least two databases, and where no consistency exists, this study relies on the source documents.

ChinaVenture official website: <http://www.chinaventure.com.cn/>; Licaicom website: www.licai.com ; Zero2IPO official website: <http://www.pedaily.cn/en/> (Chinese version).

investments made between 2004 and 2010. However, as variables such as investment success and VC reputation are typically measured over periods preceding or subsequent to a VC investment, the combined sample period spans from 1st January 2001 to 31st December 2014. Appendix A.1 presents the data sources and definitions of each variable. Investments made before 2001 are excluded because a large number of observations are missing from the Wind database in terms of the investment date by VC firms and the name of VC firms that invest in a particular portfolio firm. The final sample includes 196 VC firms and 2578 Chinese portfolio firms.

We identify lead VC of a portfolio firm as the one that originated the deal and was involved in the first round of financing. If the databases do not specify which VC originated the deal, we identify lead VC as (1) made the largest investment in the first round of financing, or (2) was involved in the most rounds of financing in a portfolio firm when the investment amount is missing¹⁴. Following Fan et al. (2007) and Sun et al. (2011), we define a lead VC as having ownership-level PTs if its controlling shareholder is the government¹⁵, and having management-level PTs if its top management team has social network ties with the government (e.g., having at least one former government official, former/current member of the People's Congress, or former/current member of the People's Political Consultative Conference). Ownership information of domestic VCs is hand collected from VC official websites and IPO firm prospectuses as pre-IPO investors including VC investors are required by the CSRC to disclose their shareholder information (or at least controlling shareholders) in IPO firm prospectus. Management-level ties information is hand collected from VC official

¹⁴ Lead VCs of 50% of portfolio firms originated the deal and were involved in the first round, 36% made the largest investment in the first round of financing, and 14% were involved in the most rounds of financing in a portfolio firm.

¹⁵ We acknowledge that VCs with ownership-level PTs also have managerial ties in addition to the direct government ownership ties.

websites, which include details of the personal background of each management team member. We find that 79 out of 113 (68%) domestic VCs are identified as having PTs, whereas 9 (11%) out of 83 foreign VCs are identified as VCs with PTs. VCs with ownership- and management-level PTs account for 20% and 23%, respectively, of the total number of VC firms. Our sample includes 25 VCs with central PTs and 60 VCs with local PTs¹⁶.

Table 2.1 presents the distribution of the portfolio firm sample. We relate venture characteristics to the headquarters of lead VCs. Specifically, we examine year of funding, industry, and region of the portfolio firms in Panels A, B, and C, respectively. Companies that went public or were acquired (M&As)¹⁷ between 2004 and 2014 are defined as “successful”, otherwise denoted “unsuccessful” exits. The number of observations (N), corresponding percentage (N%), and percentage of successful exits (% successful) are reported. The mean differences in N% and %successful between domestic and foreign VC investments are reported in columns 10 and 11, respectively. In Panel A, we show that there are an increasing number of VC investments during the sample period. Compared with foreign VC investments, the percentage of successful exits is significantly higher for domestic VC investments during 2007-2008, presumably due to the establishment of the Venture Board in 2009. Panel B shows that domestic VCs are more likely to invest in advanced manufacturing and industrial products industries, while foreign VCs are more likely to invest in communications and IT industries. Panel C shows that domestic VCs are more likely to invest in central and

¹⁶ Appendix A.2 presents VC firm distribution sorted by PTs.

¹⁷ The M&A exits include secondary-sales, which represent a very small proportion (1%) of our sample size. This study acknowledges that not all M&As represent “successful”, since VCs may engage in a fire sale nearing the end of its life cycle, resulting lower price than would be desirable (Cumming and MacIntosh, 2003; Humphery-Jenner and Suchard, 2013a).

Table 2.1: Sample distribution

This table presents the sample distribution of 2578 portfolio firms that received their initial VC funding during the period from 2004 to 2010. We relate venture characteristics to the headquarters of VC firm at portfolio firm level. Specifically, we examine year of funding, industry, and region of the portfolio firms in Panels A, B, and C, respectively. Companies that went public or were acquired between 2004 and 2014 are defined as “successful”, otherwise denoted “unsuccessful” exits. The number of observations (N), corresponding percentage (N%), and percentage of successful exits (% successful) are reported. The mean differences in N% and %successful between domestic and foreign VC investments are reported in columns 10 and 11 respectively. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

	Total			Domestic			Foreign			Diff	
	N	N%	% successful	N	N%	% successful	N	N%	% successful	N%	% successful
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]=[5]- [8]	[11]=[6]- [9]
Panel A: Year of Funding											
2004	191	7%	39%	102	6%	40%	89	9%	38%	-0.025***	0.020
2005	218	8%	30%	108	7%	36%	110	11%	25%	-0.042***	0.116
2006	297	12%	31%	127	8%	34%	170	17%	28%	-0.090***	0.056
2007	466	18%	30%	255	16%	40%	211	21%	18%	-0.051***	0.221***
2008	450	17%	25%	280	18%	31%	170	17%	15%	0.006	0.154***
2009	341	13%	23%	251	16%	25%	90	9%	17%	0.068***	0.084
2010	615	24%	15%	459	29%	17%	156	16%	12%	0.134***	0.050
Total	2578	100%	25%	1582	100%	29%	996	100%	21%	0.227***	0.079***
Panel B: Industry											
Advanced manufacturing	336	13%	33%	238	15%	38%	98	10%	21%	0.052***	0.164***
Bio & Healthcare	249	10%	22%	154	10%	19%	95	10%	26%	0.002	-0.075
Communications	436	17%	19%	209	13%	20%	225	23%	18%	-0.094***	0.018
IT	503	20%	21%	217	14%	22%	284	29%	21%	-0.148***	0.009
Energy & cleantech	149	6%	25%	100	6%	25%	49	5%	24%	0.014	0.005
Consumer related	294	11%	30%	182	12%	34%	110	11%	23%	0.005	0.108*
Industrial products	446	17%	31%	378	24%	34%	62	6%	13%	0.177***	0.210***
Others	179	7%	26%	104	7%	29%	73	7%	22%	-0.008	0.069

Table 2.1 (Continued)

	Total			Domestic			Foreign			Diff	
	N	N%	% of successful	N	N%	% of successful	N	N%	% of successful	N%	% of successful
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]=[5]-[8]	[11]=[6]-[9]
<i>Panel C: Region ^a</i>											
East	2093	81%	26%	1196	76%	29%	897	90%	21%	-0.145***	0.077***
Central	323	13%	28%	265	17%	30%	58	6%	17%	0.109***	0.111*
Northeast	60	2%	17%	40	3%	10%	20	2%	30%	0.005	-0.200*
West	102	4%	25%	81	5%	27%	21	2%	14%	0.030***	0.089

^a The east includes Beijing, Shanghai, Guangdong, Tianjin, Jiangsu, Zhejiang, Fujian, and Shandong. The central includes Shanxi, Anhui, Jiangxi, Henan, Hubei, Hebei, Chongqing, Sichuan, and Hunan. The west includes Inner Mongolia, Hainan, Guangxi, Guizhou, Yunnan, Tibet, Shan'xi, Gansu, Qinghai, Ningxia, and Xinjiang. The northeast includes Liaoning, Jilin, and Heilongjiang.

western less-developed regions, whereas 90% of foreign VC investments are in eastern regions such as Beijing, Shanghai and Guangdong.

2.3.2 Variables and summary statistics

The aim of this study is to examine the impact of PTs on VC exits in China. The dependent variable, *VC exits*, is a dummy taking the value of 1 if the portfolio firm successfully exits via IPO or M&As, and 0 otherwise. Successful exits are further divided into three subgroups: mainland IPO exits, foreign IPO exits, and M&A exits¹⁸. As mentioned in Section 2.3.1, *PTs* is measured as a dummy indicating whether the VC has government ownership or its management team has strong social network ties with the government. Based on the types and compositions of PTs, the variable *PTs* is further divided into four groups: *central ownership PTs*, *local ownership PTs*, *central management PTs*, and *local management PTs*.

Table 2.2 presents the univariate statistics for different types of VC exits sorted by VC headquarters and different groups of PTs. This analysis is at the portfolio firm level. Panel A presents sample proportions, and Panel B presents sample observations. Domestic VCs have a disproportionate tendency towards a mainland IPO exit. Indeed, for domestic VC investments, 67% ($=0.191/0.285$) of all successfully exited companies are exited via mainland IPO (see row 2), compared with 12% ($=0.025/0.206$) for foreign VC investments (see row 3). Consistent with Humphery-Jenner and Suchard (2013a), foreign IPO and M&A exits are more likely for foreign VCs (see row 4). Row 7 shows that the presence of

¹⁸ Appendix A.3 presents the statistics for the subsample of successful VC exits by investment and exit year respectively, and by headquarters.

Table 2.2: Exit-based univariate statistics

This table examines the univariate statistics for VC exits sorted by the headquarters and whether the investment is backed by VCs with political ties (PTs). Panel A presents sample proportions, and Panel B presents sample observations. The column title states the sample, and the row title states the exit type. The variable definitions are in Appendix A.1. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

Sample		Successful exits	Mainland IPO exits	Foreign IPO exits	M&A exits	Unsuccessful exits
Panel A: Sample Proportions						
All	[1]	0.254	0.127	0.058	0.070	0.746
Domestic	[2]	0.285	0.191	0.033	0.061	0.715
Foreign	[3]	0.206	0.025	0.097	0.083	0.794
Diff 1=Domestic-Foreign	[4]=[3]-[2]	0.079***	0.166***	-0.064***	-0.022**	
PTs	[5]	0.303	0.186	0.046	0.070	0.697
Without PTs	[6]	0.181	0.037	0.075	0.069	0.819
Diff 2=PTs-Without PTs	[7]=[5]-[6]	0.122***	0.149***	-0.029**	0.001	
Central ownership PTs	[8]	0.286	0.186	0.028	0.071	0.714
Local ownership PTs	[9]	0.269	0.186	0.027	0.056	0.731
Central management PTs	[10]	0.370	0.203	0.091	0.076	0.630
Local management PTs	[11]	0.294	0.171	0.038	0.085	0.706
Diff 3= Management PTs-Ownership PTs	[12]	0.059**	-0.001	0.036***	0.023*	-0.059**
Diff 4=Local PTs- Central PTs	[13]	-0.067***	-0.007	-0.056***	-0.003	0.067***
Panel B: Observations						
All	[1]	656	327	149	180	1922
Domestic	[2]	451	302	52	97	1131
Foreign	[3]	205	25	97	83	791
Diff 1=Domestic-Foreign	[4]=[3]-[2]	246	277	-45	14	340
PTs	[5]	470	289	72	109	1083
Without PTs	[6]	186	38	77	71	839
Diff 2=PTs-Without PTs	[7]=[5]-[6]	284	251	-5	38	244
Central ownership PTs	[8]	20	13	2	5	50
Local ownership PTs	[9]	172	119	17	36	468
Central management PTs	[10]	146	80	36	30	248
Local management PTs	[11]	132	77	17	38	317
Diff 3=Management PTs-Ownership PTs	[12]=[10]+[11]-[8]-[9]	86	25	34	27	47
Diff 4=Local PTs-Central PTs	[13]=[9]+[11]-[8]-[10]	138	103	-4	39	487

PTs increases the likelihood of a mainland exit but reduces the likelihood of a foreign IPO exit. This may be because VCs with PTs gain benefits of obtaining approval to mainland markets. However, these same VCs are most likely ‘persuaded’ not to exit through foreign markets as the government wants the assets retained in China. Row 12 shows that management-level PTs enjoy greater success than ownership-level PTs.

Our control variables include VC-, portfolio firm- and market-level variables. For VC-level variables, both *Rep. VC* and *VC age* are commonly used in entrepreneurial studies. More reputable and older VCs enjoy greater success due to their expertise and experience investing in entrepreneurial firms (e.g., Nahata, 2008). We also include *institutional VC indicator* since institutional VCs often have better networks with other service providers and thus are more likely to enjoy greater success (Gompers and Lerner, 2000).

For portfolio firm-level variables, *portfolio firm age* is included since young portfolio firms are often riskier (Dai et al., 2012). We also control for the number of VC firms investing in a portfolio firm (*syndicate size*) and whether a portfolio firm has both domestic and foreign VC investments (*joint investment*). Syndicated VC deals experience higher returns than standalone investments, and joint investments have a higher chance to exit successfully than those that are invested by foreign VCs alone (Dai et al., 2012).

Lerner (1994) argues that the timing of a VC exit via IPO or M&A is likely to depend on conditions in the IPO and M&A markets. We thus control for the exit market environment using two variables similar to Nahata (2008): *domestic IPO condition* and *domestic M&A condition*. We further include industry dummies to account for the industrial characteristics of portfolio firms, year dummies to control for the changing economic conditions, and regional dummies to control for regional variations in China.

Table 2.3 presents summary statistics for the subsample of exited investments. Sample means are reported. Our independent variable, *PTs*, is the highest for the subsample of firms exited through mainland IPO markets and lowest for firms exited through foreign IPO

Table 2.3: Sample statistics sorted by exit types

This table presents summary statistics for VC exits. Sample means are reported. The column title denotes the subsample under analysis. For example, column 3 presents statistics for subsample of portfolio firms that exit successfully via Chinese Mainland stock markets. The variable definitions are in Appendix A.1.

Exit type	All	Successful exits	Mainland IPO exits	Foreign IPO exits	M&A exits	Unsuccessful exits
Column	[1]	[2]	[3]	[4]	[5]	[6]
PTs	0.602	0.716	0.884	0.483	0.606	0.563
Central ownership PTs	0.027	0.030	0.040	0.013	0.028	0.026
Local ownership PTs	0.248	0.262	0.364	0.114	0.200	0.243
Central management PTs	0.153	0.223	0.245	0.242	0.167	0.129
Local management PTs	0.174	0.201	0.235	0.114	0.211	0.165
Rep. VC	0.295	0.308	0.226	0.456	0.333	0.291
VC age	7.057	6.559	6.573	6.607	6.493	7.229
Institutional VC indicator	0.060	0.075	0.049	0.154	0.056	0.055
Portfolio firm age	5.696	6.794	8.244	6.408	4.479	5.322
Syndicate size	2.042	2.762	2.627	3.463	2.428	1.797
Joint Investment	0.114	0.162	0.083	0.349	0.150	0.099
Domestic IPO condition	41.825	51.377	60.477	46.544	38.846	38.565
Domestic M&A condition	232.570	196.328	207.458	183.128	187.033	244.94
Big 3 cities	0.528	0.445	0.300	0.530	0.644	0.556
Observation	2578	656	327	149	180	1922

markets. Rep. VC is the highest for portfolio firms exiting via foreign IPO markets, while lowest for firms exiting via mainland IPO markets. This implies that PTs of VCs are likely to be substitutes for VC reputation in emerging and transitional markets. Overall, the results suggest some differences in the characteristics of VC firms and portfolio firms among different exit types.

2.4 Empirical results

2.4.1 PTs on VC exits

We first assess the impact of *PTs* on *VC exits* by using logit regression models. The logit models are implemented at the portfolio firm-level (one observation per portfolio firm) to assess whether VCs with PTs are more likely to successfully exit their investments via IPOs or M&As. The following baseline econometrics model is constructed:

$$\begin{aligned}
VC\ exits = & \alpha + \beta_1 PTs + \beta_2 VC\text{-level characteristics} + \beta_3 Portfolio\ firm\text{-level} \\
& characteristics + \beta_4 Market\text{-level characteristics} + \beta_5 Industry\ controls \\
& + \beta_6 Year\ controls + \beta_7 Regional\ controls + \varepsilon
\end{aligned} \tag{1}$$

where the dependent variable is *VC exits*, which takes a value of 1 if a portfolio firm went public or was acquired during the period from 1st January 2004 to 31st December 2014. The variable *PTs* is a dummy variable which equals 1 if the controlling shareholder of a VC firm is the government, or its management team has social network ties with the government. VC-level variables include *Rep. VC*, *VC age*, and *institutional VC indicator*. Portfolio firm-level variables include *portfolio firm age*, *syndicate size*, and *joint investment*. Market-level variables include *domestic IPO condition* and *domestic M&A condition*. Industry, year, and regional dummies are included. Detailed definitions of the variables can be found in Appendix A.1. Summary statistics is reported in Table 2.3.

Equation 1 is implemented for the whole sample, as well as for the domestic and foreign VC subsamples, separately. The results are shown in columns 1, 3, 5 of Table 2.4. We also replace the variable *PTs* with the four subgroups of PTs (*central ownership PTs*, *local ownership PTs*, *central management PTs*, and *local management PTs*) and present the regression results in columns 2, 4, and 6. All the p-values have been adjusted for heteroskedasticity and clustering by lead VC firms. The Pearson correlations in Appendix A.4 show that multicollinearity is not a major problem in this study. We also conduct the VIF test and find that the VIF values are less than 10, indicating that there is no serious collinearity problem for our models.

Table 2.4: Logit regression analysis of venture exits

This table uses logit models to analyze the impact of *PTs* on *VC exits*. The dependent variable, *VC exits*, is a dummy taking a value of 1 if the portfolio firm went public or was acquired between 1st January 2004 and 31st December 2014. Other variable definitions are presented in Appendix A.1. Industry, initial funding year and region fixed effects are included in all regressions. Intercepts are not reported. Brackets contain robust p-values clustered by lead VC firms. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

	Total		Domestic		Foreign	
	[1]	[2]	[3]	[4]	[5]	[6]
PTs	0.899*** (0.000)		1.013*** (0.000)		0.817*** (0.001)	
Central ownership PTs		0.302 (0.436)		0.577 (0.176)		
Local ownership PTs		0.586*** (0.004)		0.786*** (0.002)		
Central management PTs		1.032*** (0.000)		1.274*** (0.000)		0.886** (0.012)
Local management PTs		0.902*** (0.000)		0.984*** (0.001)		0.705*** (0.000)
Rep. VC	0.118 (0.463)	0.221 (0.138)	-0.157 (0.323)	-0.027 (0.877)	0.119 (0.634)	0.398 (0.119)
VC age	-0.062*** (0.004)	-0.057** (0.012)	-0.079*** (0.006)	-0.065** (0.022)	-0.033 (0.202)	-0.056 (0.168)
Institutional VC indicator	0.247 (0.295)	0.156 (0.512)	0.305 (0.397)	0.108 (0.763)	0.244 (0.524)	0.328 (0.347)
Portfolio firm age	0.061*** (0.000)	0.057*** (0.000)	0.053*** (0.003)	0.049*** (0.005)	0.078*** (0.000)	0.072*** (0.000)
Syndicate size	0.532*** (0.000)	0.529*** (0.000)	0.632*** (0.000)	0.634*** (0.000)	0.405*** (0.000)	0.403*** (0.000)
Joint investment	-0.195 (0.251)	-0.195 (0.256)	-0.188 (0.436)	-0.198 (0.412)	-0.196 (0.496)	-0.118 (0.704)
Domestic IPO condition	-0.504*** (0.005)	-0.505*** (0.006)	-0.264 (0.316)	-0.263 (0.320)	-1.011*** (0.000)	-1.032*** (0.000)
Domestic M&A condition	-3.890*** (0.000)	-3.851*** (0.000)	-4.123*** (0.000)	-4.056*** (0.000)	-3.730*** (0.000)	-3.802*** (0.000)
Headquarters	0.109 (0.550)	0.259 (0.193)				
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Log Pseudolikelihood	-1044.0	-1042.3	-660.3	-659.9	-358.723	-356.2
Pseudo R2	0.286	0.287	0.302	0.302	0.312	0.297
Obs.	2578	2578	1582	1582	996	996
Wald test for H0 (p-value):						
Management PTs- Ownership PTs=0		0.011**		0.064*		
Local PTs-Central PTs=0		0.663		0.443		0.675

The main finding is that the coefficients on *PTs* are all significantly positive, implying that the presence of *PTs* increases the likelihood of successful exits. The results are consistent with **H1** where being politically connected increases the odds¹⁹ of a successful exit by a factor of 1.46 or 146% ($e^{0.899}-1=1.46$). Columns 3 and 5 further show that *PTs* have stronger effects on domestic VC investments than on foreign VC investments. Substantively, *PTs* increase the odds of successful exits by a factor of 1.75 and 1.26 for domestic and foreign VC investments, respectively.

The coefficients on four subgroups of *PTs* are all positive, with only *central ownership PTs* being insignificant. In addition, the coefficients on ownership-level *PTs* are smaller than those of management-level *PTs*. To interpret, results in column 2 suggest that having controlling central and local government ownership increases the odds of successful exits by 0.35 and 0.80, respectively; and having central and local management-level *PTs* increases the odds of successful exits by 1.81 and 1.46, respectively. Also, results from the Wald test suggest that the differences between the coefficients of ownership- and management-level *PTs* are statistically significant at 5% level for the whole sample and marginally significant at 10% level for the domestic VC subsample. Thus, **H2** is supported. **H3** argues that VCs with local *PTs* enjoy greater success than VCs with central *PTs*. However, the Wald test for the equality of coefficients between central and local *PTs* does not show significant differences between central and local *PTs* on VC exits²⁰. Therefore, we find no evidence supporting our **H3**. This is inconsistent with Wu et al. (2013) that

¹⁹ The odds ratios are computed by raising e to the power of the logistic coefficient (b). The odds ratio minus 1, e^b-1 , gives the percentage change in the odds of successful exits (Y) corresponding to a one-unit increase in the independent variable (X).

²⁰ This study also finds no significant differences between VCs with central government ownership and those with local government ownership, or between VCs with central management *PTs* and those with local management *PTs*.

public firms with central PTs have better performance than those with local PTs. A possible reason is that the ongoing reallocation of economic decision-making rights from central to local governments has reduced firms' dependency on the central government for access to resources.

Effects of some control variables deserve mention. The coefficient on *VC age* is significantly negative. This is mainly because young domestic VCs with PTs enjoy greater successful exits via mainland IPO markets²¹. Consistent with previous studies (e.g., Nahata, 2008), *VC syndicate size* and *portfolio firm age* are positively related to *VC exits*. Domestic IPO and M&A conditions are negatively significant for foreign VCs. One possible reason is that despite the improvement of domestic market conditions over time, foreign VCs that have fewer local connections are less likely to exit via mainland markets. Domestic M&A condition is negatively related to domestic VC exits, presumably due to the fact that domestic VCs prefer exiting via IPOs even though domestic M&A conditions have significantly improved (Ernst and Young, 2014; Lu et al., 2013).

2.4.2 PTs and time-to-exit

This section examines the impact of PTs on the time-to-exit of VC investments using Cox hazard models. Since the Cox hazard model explicitly accounts for the time between investment and present time, it does not penalize companies that receive their first investment recently (Cao et al., 2013). The dependent variable for Cox hazard models is

²¹ This study examines the interaction of PTs with VC-level characteristics, and finds that the interaction variable between *PTs* and *VC age* is significantly negative while *VC age* insignificant for domestic VC investments. This indicates the young domestic VCs with PTs enjoy greater success.

time-to-exit, which is the number of years between the date of VC's first investment in a portfolio firm and either (a) the date of exit if the investment is exited, or (b) December 31st, 2014 if the investment is not yet exited. Control variables are the same as those in the Equation 1.

$$Time-to-exit = \alpha + \beta_1 PTs + \beta_2 Controls + \varepsilon \quad (2)$$

Table 2.5 presents the regression results. Most of the results mirror the evidence reported earlier. In the Cox hazard framework, positive (negative) coefficients of a variable indicate that the covariate increases (decreases) the hazard and hence a shorter (longer) expected time-to-exit. Consistent with **H1**, portfolio firms backed by VCs with PTs have shorter time-to-exit. In particular, the results in column 1 shows a hazard ratio of 1.96 for *PTs*, indicating that VCs with PTs have approximately twice the chance of exiting than VCs without PTs. Consistent with **H2**, the Wald test shows that VCs with management-level PTs have shorter time-to-exit than VCs with ownership-level PTs. However, we find no evidence supporting **H3** that VCs with local PTs have a higher chance of exiting their investments than VCs with central PTs.

2.4.3 PTs on different exit types

To further test **H1**, **H2**, and **H3**, we assess the impact of *PTs* on the likelihood of a successful exit via different exit types (IPO exit via mainland markets, IPO exit via foreign.

Table 2.5: Cox hazard analysis of time-to-exit

This table uses Cox hazard models to analyse the impact of PTs on portfolio firms' time-to-exit. *Time-to-exit* is the number of years between the date of VC's first investment in a portfolio firm and either (a) the date of exit if the investment is exited, or (b) December 31st, 2014 if the investment is not exited. Other variable definitions are presented in Appendix A.1. Industry, initial funding year, and region fixed effects are included in all regressions. Intercepts are not reported. Brackets contain robust p-values clustered by lead VC firms. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

	Total		Domestic		Foreign	
	[1]	[2]	[3]	[4]	[5]	[6]
PTs	0.635*** (0.000)		0.634*** (0.000)		0.620*** (0.000)	
Central ownership PTs		0.410** (0.019)		0.562*** (0.007)		
Local ownership PTs		0.429*** (0.004)		0.524*** (0.005)		
Central management PTs		0.800*** (0.000)		0.894*** (0.000)		0.748*** (0.000)
Local management PTs		0.593*** (0.000)		0.612*** (0.002)		0.477** (0.028)
Rep. VC	0.132 (0.189)	0.188* (0.082)	-0.049 (0.617)	0.013 (0.909)	0.189 (0.435)	0.196 (0.406)
VC age	-0.038** (0.014)	-0.034** (0.039)	-0.045** (0.036)	-0.035 (0.093)	-0.030 (0.394)	-0.024 (0.500)
Institutional VC indicator	0.140 (0.321)	-0.010 (0.954)	0.214 (0.248)	-0.019 (0.928)	0.293 (0.305)	0.303 (0.251)
Portfolio firm age	0.044*** (0.000)	0.040*** (0.000)	0.036*** (0.004)	0.035*** (0.005)	0.047*** (0.004)	0.050*** (0.001)
Syndicate size	0.272*** (0.000)	0.261*** (0.000)	0.266*** (0.000)	0.256*** (0.000)	0.260*** (0.000)	0.255*** (0.000)
Joint investment	0.037 (0.738)	0.026 (0.814)	0.168 (0.271)	0.155 (0.308)	-0.012 (0.952)	-0.011 (0.958)
Domestic IPO condition	-0.068 (0.641)	-0.067 (0.646)	0.205 (0.376)	0.202 (0.382)	-0.468*** (0.001)	-0.481*** (0.000)
Domestic M&A condition	-2.600*** (0.000)	-2.618*** (0.000)	-2.524*** (0.000)	-2.531*** (0.000)	-2.865*** (0.000)	-2.896*** (0.000)
Headquarters	-0.079 (0.438)	0.033 (0.782)				
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Log Pseudolikelihood	-4528.8	-4530.5	-2917.5	-2916.7	-1189.9	-1190.8
Obs.	2577	2577	1581	1581	996	996
Wald test for HO (p-value):						
Management PTs-Ownership PTs=0		0.012***		0.070*		
Local PTs-Central PTs=0		0.135		0.113		0.264

Table 2.6: Multinomial logit analysis of exit routes

In Panel A, we use the multinomial logit model to examine the likelihood of a successful exit via four major routes: IPO via Chinese Mainland stock markets, IPO via foreign stock markets, M&As, and liquidations (including unsuccessful exits). The dependent variable takes four discrete values respectively for these four major exit routes. In Panel B, we rerun the regression by replacing the variable PTs with the four subgroups of PTs, and only report the coefficients for these four subgroups of PTs. Industry, initial funding year and region fixed effects are also included in all regressions. Other variable definitions are presented in Appendix A.1. Intercepts are not reported. Brackets contain robust p-values clustered by the lead VC firms. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

Sample Exit routes	Total			Domestic			Foreign		
	IPO Mainland	IPO foreign	M&A	IPO Mainland	IPO foreign	M&A	IPO Mainland	IPO foreign	M&A
Column	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
<i>Panel A: The impact of PTs on the choices of exit routes</i>									
PTs	1.204*** (0.000)	0.442 (0.109)	0.700*** (0.003)	1.466*** (0.000)	-0.414 (0.520)	0.486 (0.125)	0.891 (0.121)	0.321 (0.184)	0.815** (0.020)
Rep. VC	-0.113 (0.576)	0.516* (0.055)	0.029 (0.909)	-0.295* (0.052)	1.141** (0.030)	-0.297 (0.382)	1.257** (0.036)	0.023 (0.948)	0.133 (0.671)
VC age	-0.069** (0.012)	-0.061 (0.142)	-0.044 (0.110)	-0.074** (0.013)	-0.021 (0.778)	-0.070 (0.101)	-0.107 (0.141)	-0.025 (0.572)	-0.038 (0.378)
Institutional VC indicator	0.088 (0.82)	1.047** (0.013)	-0.115 (0.774)	-0.258 (0.490)	1.674*** (0.000)	0.111 (0.853)	1.300*** (0.001)	0.086 (0.837)	-0.507 (0.477)
Portfolio firm age	0.087*** (0.000)	0.073*** (0.000)	-0.045* (0.065)	0.083*** (0.000)	0.007 (0.868)	-0.074** (0.032)	0.115*** (0.006)	0.111*** (0.000)	-0.043 (0.219)
Syndicate size	0.497*** (0.000)	0.580*** (0.000)	0.335*** (0.000)	0.586*** (0.000)	0.665*** (0.000)	0.439*** (0.000)	-0.000 (0.999)	0.485*** (0.000)	0.109 (0.307)
Joint investment	-0.628** (0.014)	0.653** (0.017)	-0.181 (0.511)	-0.844*** (0.002)	1.376*** (0.000)	-0.115 (0.777)	1.165** (0.025)	-0.147 (0.514)	-0.191 (0.648)
Domestic IPO condition	1.060** (0.03)	-0.819*** (0.001)	-1.223*** (0.000)	1.340** (0.015)	-1.053*** (0.000)	-1.189*** (0.000)	-0.783 (0.100)	-0.258 (0.405)	-0.966*** (0.000)
Domestic M&A condition	-2.099*** (0.000)	-3.842*** (0.000)	-3.965*** (0.000)	-3.915*** (0.000)	-3.476*** (0.000)	-4.202*** (0.000)	-4.170*** (0.000)	-2.165*** (0.000)	-0.038 (0.378)
Headquarters	1.416*** (0.000)	-1.036*** (0.000)	-0.327 (0.175)						

Table 2.6 (Continued)

Sample Exit routes	Total			Domestic			Foreign		
	IPO Mainland	IPO foreign	M&A	IPO Mainland	IPO foreign	M&A	IPO Mainland	IPO foreign	M&A
Column	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log Pseudolikelihood		-1429.6			-865.7			-487.7	
Pseudo R2		0.333			0.348			0.310	
Obs.		2578			1582			996	
Panel B: The impact of different types of PTs on the choices of exit routes									
Central ownership PTs	1.069** (0.011)	-0.704 (0.204)	0.018 (0.972)	1.461*** (0.002)	-1.744** (0.011)	-0.115 (0.849)			
Local ownership PTs	0.962*** (0.001)	0.136 (0.769)	0.328 (0.307)	1.216*** (0.001)	-0.383 (0.605)	0.338 (0.366)			
Central management PTs	1.384*** (0.000)	0.818*** (0.007)	0.754** (0.015)	1.744*** (0.000)	-0.069 (0.914)	0.395 (0.428)	0.727 (0.280)	0.723** (0.041)	1.125** (0.017)
Local management PTs	1.147*** (0.000)	0.008 (0.982)	0.868*** (0.001)	1.391*** (0.000)	-0.987 (0.425)	0.814** (0.038)	1.184* (0.083)	0.379 (0.266)	0.761** (0.042)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald test for HO (p-value):									
Management PTs-Ownership PTs=0	0.094*	0.136	0.042**	0.121	0.443	0.349	0.121	0.018**	0.005***
Local PTs-Central PTs=0	0.340	0.017**	0.736	0.191	0.303	0.370	0.544	0.479	0.484

markets, M&A exits, and unsuccessful exits) in a multinomial logit setting²²

Table 2.6 presents the multinomial logit regression results. The dependent variable takes four discrete values respectively for mainland IPOs, foreign IPOs, M&As and unsuccessful exits. The independent variables are the same as those in Equation 1. Consistent with **H1**, the results show that *PTs* have positive impacts on different types of successful VC exits (see columns 1-3 in Panel A). Such impacts are statistically significant for mainland IPO and M&A exits, but not for foreign IPO exits. Substantively, *PTs* increase the odds of a mainland IPO exit by a factor of 2.33 and the odds of an M&A exit by 1.01. Columns 4 and 9 further show that *PTs* facilitate mainland IPO exits for domestic VCs, and M&A exits for foreign VCs.

Panel B of Table 2.6 presents the results when the variable *PTs* is replaced with the four subgroups of *PTs*. Control variables are not reported. The Wald test suggests that management-level *PTs* enjoy more successful exits via mainland IPO and M&A markets than VCs with ownership-level *PTs*. Thus, **H2** is further supported. However, the results again fail to find support for **H3**, with the Wald test showing no significant differences between central and local *PTs* on different types of successful exits.

2.4.4 Robustness tests

In the above analyses, *PTs* has emerged as a consistent predictor of successful VC exits.

²² In case that the independence of irrelevant alternatives may be violated, we use binary logit models and multinomial probit models as further robustness tests. Appendix A.5 shows the results using binary logit models. We find that the key results are qualitatively the same.

Table 2.7: Analysis of VC exits controlling for endogeneity arising from receipt of funding from VCs with PTs

This table reports the results of two-step regressions. The dependent variable for the first step (column 1) is *PTs*, which takes the value of one if the lead VC is government controlled or has social network ties with the government. The dependent variable for column 2 is *VC exits*, which takes the value of one if the portfolio firm backed by venture capital went public or was acquired, and 0 if it is still private by 31st December 2014. The Cox hazard model is estimated with the *time-to-exit* being the dependent variable. The dependent variables for columns 4-6 are binary values which take one for mainland IPO, foreign IPO and M&A exits respectively. Governmental intervention development index (GIID) and province dummy JZ (1=Jiangsu and Zhejiang provinces, 0 otherwise) are used as instrumental variables for PTs. Other variable definitions are presented in Appendix A.1. Industry, initial funding year, and region fixed effects are included in all regressions. Intercepts are not reported. Robust p-values clustered by lead VC firms are shown in the brackets. The significance levels at the 1%, 5%, and 10% are identified by ***, **, and *, respectively.

Dependent variable Column	First step	Second step				
	Probit (PTs=1)	Logit (VC exits=1)	Cox hazard (Time-to-exit)	Logit (IPO mainland=1)	Logit (IPO foreign=1)	Logit (M&A=1)
	[1]	[2]	[3]	[4]	[5]	[6]
PTs		0.756** (0.033)	0.727*** (0.003)	0.968*** (0.006)	-0.121 (0.835)	0.196 (0.693)
GIID	-0.080* (0.088)					
JZ	0.500*** (0.003)					
VC reputation	0.003 (0.992)	0.118 (0.392)	0.132 (0.194)	-0.214 (0.211)	0.571** (0.015)	0.018 (0.976)
VC age	0.107*** (0.105)	-0.108*** (0.005)	-0.088*** (0.002)	-0.127*** (0.002)	-0.003 (0.961)	-0.022 (0.716)
Institutional VC indicator	-0.145 (0.800)	0.318 (0.205)	0.295** (0.037)	-0.008 (0.978)	0.945*** (0.004)	-0.394 (0.312)
Portfolio firm age	0.033*** (0.000)	0.042** (0.023)	0.020 (0.162)	0.056*** (0.002)	0.062** (0.041)	-0.085*** (0.007)
Syndicate size	-0.034 (0.234)	0.534*** (0.000)	0.289*** (0.000)	0.358*** (0.000)	0.394*** (0.000)	0.116* (0.075)
Joint investment	-0.040 (0.756)	-0.133 (0.445)	0.034 (0.767)	-0.631** (0.023)	0.742*** (0.001)	-0.212 (0.441)
Domestic IPO condition	0.046 (0.289)	-0.499*** (0.006)	-0.089 (0.556)	1.637*** (0.001)	-0.402** (0.044)	-1.063*** (0.000)
Domestic M&A condition	-0.185* (0.074)	-1.432*** (0.000)	-2.838*** (0.000)	-1.182*** (0.000)	-1.567*** (0.000)	-2.032*** (0.000)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Log Pseudolikelihood	-1465.1	-1071.3	-4551.5	-729.9	-415.897	-513.651
Pseudo R2	0.154	0.267		0.256	0.270	0.213
Obs.	2578	2578	2577	2578	2578	2578

This section presents relevant robustness tests to check the reliability of the results. First, we use a two-stage approach to address endogeneity concerns. The relationship between PTs and VC exits might be due to a “selection” effect by which successful portfolio firms are more likely to match with politically connected VCs. If so, the match between a firm and VC with PTs may to some extent be endogenous and is likely to be related to portfolio firm characteristics. In this study, we use the governmental intervention development index (GIID) developed by Fan, Wang, and Zhu (2009) and kindly provided by Liu et al., (2013) as one of the instrumental variables for PTs. This index is a score measuring the level of market development. A lower (higher) GIID indicates more (less) government intervention. It is argued that entrepreneurial firms in provinces with more government intervention are more likely to seek political capital. Another instrumental variable is the JZ dummy which equals to 1 if the portfolio firm is located in Jiangsu or Zhejiang province, and 0 otherwise. Though having a better market development, these two provinces also have a larger proportion of VCs with PTs than other provinces. The results are robust to omitting any of these two instruments. We first estimate predicted values of PTs and then uses the predicted values in the second step. Specifically, in the first step, we use the probit model with all the control variables and the additional instruments of GIID and JZ dummy to predict PTs. Then we rerun the logit and Cox hazard models by using the predicted values of PTs. The results are reported in Table 2.7. The results are qualitatively similar to those in Tables 2.4-2.6 that PTs facilitates VCs’ successful exits, particularly through mainland IPO exits.

Second, we use the PSM approach proposed by Rosenbaum and Rubin (1983) to address the potential selection bias (endogeneity). Designed for multi-dimensional matching, the PSM approach integrates the relevant pre-treatment characteristics of each

treatment and control subject into a single-index variable (propensity score). Then it makes simultaneous matching across all the relevant variables while controlling for endogeneity at the same time. Here, portfolio firms backed by politically connected VCs are matched with one or more portfolio firms with similar characteristics but without politically connected VC backing. Three PSM techniques (nearest neighbour matching, propensity score matching, and inverse-probability weighting) are used since each matching technique involves tradeoff between the number of matches and the quality of matching (e.g., Curtis et al., 2007; Lee and Masulis, 2011). Table 2.8 presents the “Average effect of the Treatment on the Treated” (ATT) estimates of different types of VC exits - all exits, mainland IPO exits, foreign IPO exits, and M&A exits. Overall, we find that after controlling for other VC and portfolio firm characteristics, the results support the previous arguments that VCs with PTs have better exits, particularly through mainland IPO and M&A exits (see Panel A), and VC with management PTs enjoy greater exits than VCs with ownership PTs (see Panels B and C).

Third, the results are robust to either a different definition of VC exits or excluding sample observations in years 2009 and 2010. The sluggish Chinese stock market in late 2012 and overseas frauds in 2010 lead to fewer successful VC exits (The Wall Street Journal, 2013). Consequently, investments made in later periods are subject to a less favourable exiting environment. Dai et al., (2012) argue that firms that receive later-funding often imply success in earlier operations. Thus, we introduce a different definition of VC success which equals 1 if the portfolio firm went public, or was acquired, or received follow-up funding before 31st December 2014, and 0 otherwise. The likelihood of successful exits increases from 25% to 34% after this adjustment. The coefficient on PTs

Table 2.8: Estimation of average treatment effect based on Propensity Score Matching (PSM)

This table presents the “Average effect of the Treatment on the Treated” (ATT) estimates of different types of VC exits (including all exits, mainland IPO exits, foreign IPO exits, and M&A exits). Three PSM techniques are used - nearest neighbourhood, Gaussian, and Stratification. Panel A shows the ATT for portfolio firms backed by VCs with PTs versus VCs without PTs. Panel B shows the average treatment effects for portfolio firms backed by VCs with ownership-level PTs versus VCs without ownership-level PTs, and Panel C shows the average treatment effects for VCs with management-level PTs and VCs without management-level PTs. Panel D shows for portfolio firms backed by VCs with central and VCs without central PTs, and Panel F shows for VCs with local and VCs without local PTs. Brackets contain robust t statistics. The variable definitions are in Appendix A.1. Matching is conducted with replacement and bootstrapped standard errors are used for statistical inference. The bootstrapped standard errors are based on 100 replications. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

	Nearest Neighbour	Gaussian	Stratification
Panel A: PTs			
All exits	0.162 (1.429)	0.100*** (2.954)	0.160*** (4.047)
Mainland IPO exits	0.129* (1.814)	0.085*** (2.746)	0.121*** (4.355)
Foreign IPO exits	0.000 (0.000)	-0.013 (-0.646)	0.006 (0.371)
M&A exits	0.033 (0.495)	0.028* (1.883)	0.033** (2.344)
Panel B: Ownership-level PTs			
All exits	-0.013 (-1.162)	-0.011 (-0.988)	-0.011 (-1.005)
Mainland IPO exits	0.072*** (3.252)	0.072*** (4.731)	0.073*** (4.194)
Foreign IPO exits	-0.031** (-2.180)	-0.035*** (-3.942)	-0.036*** (-3.747)
M&A exits	-0.025 (-1.569)	-0.013 (-1.158)	-0.011 (-0.969)
Panel C: Management-level PTs			
All exits	0.032** (2.161)	0.026** (2.308)	0.028*** (2.632)
Mainland IPO exits	0.052** (2.429)	0.068*** (4.002)	0.067*** (3.831)
Foreign IPO exits	0.008 (0.573)	0.004 (0.390)	0.003 (0.271)
M&A exits	0.032** (2.161)	0.026** (2.373)	0.028*** (2.606)
Panel D: Central PTs			
All exits	0.082*** (2.638)	0.091*** (3.764)	0.079*** (3.053)
Mainland IPO exits	0.044* (1.745)	0.065*** (3.595)	0.019*** (3.031)
Foreign IPO exits	0.023 (1.345)	0.023* (1.679)	0.014 (1.046)
M&A exits	0.015 (0.890)	0.003 (0.227)	0.003 (0.241)

Table 2.8 (Continued)

	Nearest Neighbour	Gaussian	Stratification
<i>Panel E: Local PTs</i>			
All exits	0.064** (2.458)	0.052** (2.495)	0.050** (2.479)
Mainland IPO exits	0.086*** (4.363)	0.073*** (4.714)	0.071*** (4.635)
Foreign IPO exits	-0.037** (-2.577)	-0.035*** (-4.071)	-0.037*** (-3.803)
M&A exits	0.016 (1.035)	0.014 (1.325)	0.015 (1.403)

decreases from 0.899 to 0.681, but is still significant at the 1 percent level. The results are reported in Appendix A.6. We also find that our results are robust when we exclude VC investments made in 2009 and 2010.

Fourth, the results are robust to the institutional differences across regions. Previous studies suggest that as well-functioning legal systems protecting property rights become available, the effects of PTs on firm outcomes reduce (e.g., Guthrie, 1998; Peng and Luo, 2000; Siegel, 2007). In China, there is substantial environmental heterogeneity across cities in China (Chen et al., 2011; Liu et al., 2013). Beijing, Shanghai, and Shenzhen are the three cities that often lead market development and have greater protection for investors and private property rights as compared to other regions (Zhou, 2013). According to the National Bureau of Statistics of the People's Republic of China²³, these three cities are among the top in terms of regional per capita GDP and foreign fund inflows across our sample period. Thus, we split the sample based on the two regional clusters. Then we regress the variable, *VC exits*, on *PTs* and control variables for these sub-samples. Regression results are reported in Appendix A.7. VCs with PTs enjoy greater success in both developed and less-developed regions. For foreign VCs, the impact of PTs increases

²³ <http://data.stats.gov.cn/workspace/index?m=hgnd> (in Chinese)

for investments in less developed regions, implying that PTs substitute for formal legal institutions in less developed regions for foreign VC investments. The stronger impact of PTs in more developed cities for domestic VCs may be due to the fact that domestic VCs benefit more from a strong institutional environment since it can help domestic VCs relax resource constraints (e.g. human capital and financial intermediaries) (Ke and Wang, 2015).

Lastly, the results are robust to focusing on recent deals. One concern is that the sample comprises few deals before 2006. It is possible that VCs only reported information on successful exits during this period (Humphery-Jenner and Suchard, 2013a). This may induce some sample selection bias. Thus this study ensures that the key results are qualitatively the same after excluding deals before 2006.

2.5 Conclusion

This essay examines the contribution of PTs to VC success in China. Based on the results of the portfolio firm-level analysis, this study finds that VCs with PTs enjoy greater success in terms of exiting their investment through mainland IPOs and M&As. It further investigates the contingent value of VC political ties, and finds that management-level PTs have greater positive effects on VC exits than ownership-level PTs. However, this study finds no evidence that VCs with local PTs have greater success than those with central PTs. The overall results are robust to several robustness checks- controlling for endogeneity concerns, selection bias, alternative measures for VC exits, and legal and institutional differences across regions.

CHAPTER THREE

ESSAY TWO

This chapter presents the second essay which investigates whether VCs, particularly those with PTs, play an external monitoring role on earnings management (EM) through abnormal accruals in Chinese IPOs. Two EM measures – cross sectional modified Jones (1981) and Kothari, Leone, and Wasley (2005)'s performance matched abnormal accruals – are used. Cross-sectional regressions are conducted to examine whether the two types of PTs (ownership- and management- level PTs) and VC lock-up sale affect EM of VC-backed IPOs.

Section 3.1 presents an overview of the study. Section 3.2 provides literature review and hypotheses development. Section 3.3 describes the data, variables, and methodology. The empirical results and robustness tests are presented in Section 3.4. Section 3.5 presents the impact of PTs and VC lock-up sale on stock performance, while Section 3.6 concludes. The chapter's appendices and references are presented in Appendix B and the Reference sections, respectively.

VC political ties and IPO earnings management:

Evidence from China

Abstract: This study empirically examines the effects of VC political ties (PTs) on earnings management (EM) of IPOs controlled by private entrepreneurs in China. It documents that IPO issuers backed by VCs with ownership-level PTs are more likely to conduct opportunistic IPO-year EM, while those backed by VCs with management-level PTs are associated with lower IPO-year EM. The higher IPO-year EM in IPOs backed by VCs with ownership-level PTs is mainly driven by VC lock-up sale within six months following VC lock-up expiration, while the lower EM in IPOs backed by VCs with management-level PTs is not significantly associated with VC lock-up sale. Further, this study provides evidence that IPOs subject to exits from VCs with ownership-level PTs have poorer post-issue stock performance, while IPOs backed by VCs with management-level PTs have better post-issue stock performance regardless of VC lock-up sale.

Keywords: Earnings Management; Venture Capital, Political Ties, Transitional Markets, China

JEL classification: G24, G32

3.1 Introduction

This study examines the effect of external monitoring on earning management (EM) through abnormal accruals in a transitional and emerging market. Specifically, it examines the effects of venture capital firms (VCs) with political ties (PTs) on EM in companies conducting IPOs. Prior research grounded within agency framework documents that companies manage their earnings to improve short-term performance around IPOs (Teoh et al., 1998a, 1998b). Recent developed market studies show that managers' discretion is affected by the presence of VC investors (Cumming et al., 2007), and VC-backed IPOs, especially those backed by reputable VCs, have significantly lower EM and better post-IPO performance than non-VC-backed IPOs (e.g., Morsfield and Tan, 2006; Lee and Masulis, 2011; Wongsunwai, 2013). In emerging markets where government intervention is still prevalent, PTs bring resources as well as facilitate access to the IPO market (e.g., Liu et al., 2013; Chen, Liu, and Su, 2013; Li and Zhou, 2015). Further, politically connected VCs enjoy greater number of successful exits and thus are often considered as more reputable than their non-connected counterparties (Cao et al., 2013; Wang, Anderson, and Chi, 2013; Zero2IPO Research²⁴). Consequently, this study asks: do VCs with PTs that are considered as more reputable play a better monitoring role in a transitional market? Or are they more reputable simply because of their PTs which facilitate successful exits?

The existing evidence derived from developed markets regarding the role of VCs or reputable VCs may not be equally applicable to transitional markets, such as China, for the following reasons. First, transitional markets are often characterized by significant government involvement in their capital markets, which may affect the role of VCs in

²⁴ See http://www.pedata.cn/list_do/toList_2014 (In Chinese)

monitoring entrepreneurial firms. In China, the government plays dual roles. It acts as not only the regulator but also significant economic player. For example, for firms to be listed on a Chinese stock exchange, final approval from the CSRC is required. In addition, up to a third of total domestic venture capital invested is government funded, with provincial government-controlled VCs playing a significant role in regional markets (Cao et al., 2013). Compared with developed markets, this feature of significant government ownership may affect VCs' incentives to monitor their clients as well as their behaviour in obtaining portfolio firms. Second, transitional markets are often criticized for their weak investor protection (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998). Without proper incentives and enforcement regimes, VCs may not act in the best interests of outside investors. Consequently, the role of VCs in monitoring IPO issuers can be largely constrained by the institutional background.

China's VC industry has grown rapidly during the past two decades, with annual VC investment value increased from virtually non-existent in 1991 to US\$5.0 billion in 2012, becoming the second largest following the US (Ernest and Young, 2014). However, little is known empirically about whether these VCs actively monitor management decisions and protect long-term shareholder value. The majority of VCs in China are either government-controlled²⁵, with natural connections with governments, or have an executive with personal connections with governments (Liu et al., 2013). Though government-controlled VCs have better access to private information and resources, significant government ownership may lead to inefficiency and politically motivated decisions (Okhmatovskiy, 2010; Cao et al., 2013). In addition, their

²⁵ As previously mentioned, government-controlled VCs and VCs with ownership-level PTs are used interchangeably.

uncompetitive compensation packages make it hard to attract and retain top managers²⁶ (Chen, Guan, Ke, 2013; PE Daily, 2013). On the other hand, VCs with management-level PTs obtain benefits of PTs while maintaining the autonomy of selecting and advising companies. Top managers or general partners²⁷ of these VCs are often founders or shareholders and are more likely to be concerned with the long-term success of their VC firms. For these reasons, VCs with different types of PTs (ownership- and management-level PTs) face different incentives with respect to monitoring EM decisions of IPO issuers. The Chinese VC market, with its divergent ownership structure and government intervention, allows us to investigate the impact of different VC investors on earnings quality and, in turn, post-IPO performance.

Specifically, we investigate the role of VCs with different types of PTs in constraining IPO-year EM for entrepreneurial firms. Using a sample of 924 entrepreneurial firms listed on the SME and Venture Boards during 2004-2012, the results provide evidence that IPOs backed by VCs with ownership-level PTs exhibit more income-increasing IPO-year EM than other IPO issuers. In contrast, companies backed by VCs with management-level PTs show less opportunistic EM. The higher IPO-year EM in government controlled VC-backed IPOs is mainly due to the lock-up sale within six months following the lock-up expiration. However, the lower EM associated with IPOs backed by VCs with management-level PTs are not significantly associated with the lock-up sale. Lastly, we document that government VC-backed IPOs, especially those subject to VC lock-up sale, exhibit poorer long-run stock performance;

²⁶ Top managers of government-controlled VCs held no shares, and they cannot benefit from increasing annual net profits of VC firms. However, they can obtain around 2-5% of net profits from each investment they successful exit (see Section 3.2.3.1 for detailed discussion).

²⁷ If a VC fund is formed as a limited partnership, the fund management is referred to as the general partners of the fund. If it is formed as a corporation, the fund management is referred as to top managers of the VC firm. The majority of government-controlled VCs are structured as limited companies, whereas the privately controlled VCs are a mixture of limited companies and limited partnerships because limited partnership has become legal in China as an organisational form since June 2007.

whereas IPOs backed by VCs with management-level PTs exhibit better post-issue stock performance regardless of VC lock-up sale. These results are robust to different EM measures (cross-sectional modified Jones and performance matched abnormal accruals) and the endogenous choice of VC backing (two-step and propensity score matching approaches).

This study contributes to the existing literature in the following ways. First, to the best of knowledge, this is the first study that examines the role of VCs in affecting EM decisions of IPO issuers in a transitional market. It is important to examine how the institutional environment changes the governance roles of VCs in the context of potential manipulation of earnings information provided to outside investors. Second, this study extends the PTs literature by examining the role of government-controlled VCs and private VCs with management-level PTs in affecting IPO issuers. While the existent literature on the government's role in VC has mainly focused on government support of VCs in developed markets (e.g., Lerner, 1991; Leleux and Surlemont, 2003; Brander et al., 2008), the role of direct government ownership and management-level PTs in monitoring management decisions of IPO issuers remains relatively underexplored. Third, this study provides some evidence regarding the effects of the lock-up restrictions on IPO-year EM. The results show that the lock-up sale within six months following VC lock-up expiration is one of the key factors leading to the higher EM in IPOs backed by VCs with ownership-level PTs.

The rest of the paper is organised as follows. Section 3.2 provides the hypotheses development and related literature. Section 3.3 describes the data sample, variables and methodology used in this essay. Section 3.4 presents the empirical results and

robustness tests. The relation between VCs with PTs, lock-up sale, and post-IPO performance is explored in Section 3.5. Section 3.6 concludes this study.

3.2 Institutional background, literature review, and hypotheses development

3.2.1 Institutional background

Driven primarily by the US success in utilizing VC to encourage innovation and growth, the Chinese government started to promote VC to fill the SME finance gap in the mid-1980s. China's VC industry experienced slow development in its first ten years, with central and local government VC firms being major players. The first breakthrough did not occur until the late 1990s when private capital was allowed to invest in VC funds. In 1996, individuals, large corporations, and universities, which were prohibited from investing in VC funds, were allowed to enter the VC industry. In 2004, the right to private property was recognized for the first time by the government and constitutionalized, which demonstrates the Chinese government's commitment in encouraging and supporting its private sector. The introduction of the SME Board in 2004 and the Venture Board in 2009 has enriched the exit channels for VC investments. These institutional changes, together with the strong growth of China's economy, have attracted a wave of funds into its VC industry (Guo and Jiang, 2013).

In developed markets, VC firms are often considered as not only capital providers, but also active institutional investors which mitigate information asymmetries and add value to their portfolio firms (e.g., Amit et al., 1998; Hellman and Puri, 2002; Hochberg, 2005). However, academics and practitioners generally agree that VC activities are practiced in a markedly different way within China due to significant institutional differences between China and developed economies (Burton and Ahlstrom, 2003; Tan

et al., 2013; Lu et al., 2013). Despite the continued effort of the government in developing its legal systems, China's formal institutions (e.g., laws, rules, and regulatory and enforcement regime) are still largely underdeveloped (Ahlstrom and Bruton, 2006). For example, although China's accounting rules and reporting standards have improved significantly during the last decade, the accounting information on earnings may not be reliable, especially for young private firms (Noronha et al., 2008). Thus, investments in entrepreneurial firms are more risky for VC firms (e.g., Bruton and Ahlstrom, 2003). In addition, due to weak investor protection and enforcement in laws and regulations, VCs in China have a strong investment preference towards late-stage deals and conventional sectors (Ernst and Young, 2014).

China's VC market is characterized by the prevalence of government involvement in its VC development. The Chinese government influences the VC industry by establishing investment agencies and funds and tackling the capital gap through providing incentives to private sector VC funds. Although the first VC firm was established by the central government in 1985, local government-controlled VCs are now one of the major and direct players in regional markets (Guo, 2008). For example, Shenzhen Capital Group (SCGC), a dominant municipal government-controlled VC firm, was ranked as No.1 venture capital in China by Forbes magazine for 2011, 2012, and 2013, with a total investment amount of RMB 14.9 billion. It listed more than 30 portfolio firms in the domestic A-share markets and 33 in other stock markets. Another example is Govtor Capital, an active government-owned VC firm in Jiangsu province, managing capital of more than RMB30 billion. It has invested in more than 500 entrepreneurial firms, with 51 successfully exited through IPOs.

The Chinese government also exerts strict administrative control over the IPO process in its capital market. To be listed on the domestic stock exchanges, companies need final approval from the CSRC. Although the Chinese government has promulgated a number of laws and regulations to guide the IPO selection process, the legislation contains a large number of soft, qualitative, and ambiguous requirements (Yang, 2013). For example, Decree 30 of the CSRC (2006) states that “an issuer shall not have any major debt-paying debt or involve with any contingent issue such as guaranty, litigation, and arbitration that may negatively affect its business operations”. The purpose of these criteria is to provide flexibility for the CSRC officials and the Stock Issuance Examination and Verification Committee (SIEVC) members to select better-performing firms with high growth potential. However, these requirements also give the government officials a great amount of discretion in their decision making which creates room for PTs to play a role in the IPO selection process (Yang, 2013; Liu et al., 2013).

3.2.2 Literature review

3.2.2.1 IPO earnings management in general

EM is defined by Healy and Walhen (1999, p.368) as “...judgments in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers”. Prior IPO EM research indicates that IPOs exhibit opportunistic income-increasing EM in both the pre-issue and post-issue time periods (e.g., DuCharme et al., 2001, 2004; Teoh, Wong, and Rao, 1998a). Some studies further document a negative relation between EM and post-issue stock performance, suggesting that enhancing short-term earnings has long-term costs (e.g. Teoh, et al., 1998b). However, recent study by Ball and Shivakumar

(2008) questions the validity of this hypothesis and documents that IPO firms on average manage earnings more conservatively in pre-issue periods due to the increased stakeholder scrutiny and monitoring by auditors and other stakeholders.

Prior studies in China generally document opportunistic income-increasing EM during IPOs and they find various factors leading to the upward EM. For example, Aharony, Lee, and Wong (2000) document evidence of EM by SOEs during 1992-1995, and find that managers of SOEs manage earnings upward to increase the possibility of their firms being selected for listing since this results in higher prestige and other non-pecuniary benefits. Kao, Wu, and Yang (2009) examine the regulation impact on opportunistic reporting practices during 1996-1999, and find that the pricing regulation, which stipulates that IPO prices be a function of accounting performance, induced IPO firms to overstate their earnings; while the penalty regulation, which penalizes IPO firms for overly optimistic forecasts, deterred IPO firms from making overoptimistic earnings forecast. Liu and Lu (2007) link EM with corporate governance and find that agency conflicts between controlling shareholders and minority investors account for a significant portion of EM in Chinese listed firms during 1999-2005.

3.2.2.2 VC backing and EM

The developed market evidence on the role of VC backing on EM is limited and mixed. On one hand, several studies support the prediction that active monitoring role of VC firms constrains opportunistic EM of IPO issuers (Hochberg, 2012; Morsfield and Tan, 2006). VCs actively monitor and motivate management (e.g., Gompers, 1995; Katz, 2009), and this, in turn, leads to less EM (Cornett, Marcus, Saunders, and Tehranian, 2006; Morsfield and Tan, 2006). On the other hand, some studies document

greater EM by VC-backed firms than by non-VC-backed firms. For example, Gompers (1996) argues that young VC firms have strong incentives to push their portfolio firms to go public prematurely (the so-called grandstanding effect), in order to build successful track records before going back to fundraise for a new limited partnership (Lee and Wahal, 2004). Stross (2000) and Healy (2002) suggest that the interests of VCs may conflict with other pre- or post- IPO investors around the time of offering and VCs may use their influence over management to artificially inflate IPO price.

While the effects of VC backing is uncertain on EM, studies generally document that reputable VCs restrain EM since VCs with established reputation bear greater risks of loss. Lee and Masulis (2011) find that more reputable VCs are more likely to constrain pre-IPO earnings management of their backed firms than less reputable VCs. Wongsunwai (2013) shows that companies backed by high-quality VCs are associated with lower abnormal accruals in the period immediately preceding lock-up expiration. These VCs care more about the long-term success of their backed firms because firms that went public under their guidance will act as future references for subsequent investment negotiations (Nam, Park, and Arthurs, 2014). Indeed, Hsu (2004) shows that highly reputable VCs can get 10-14 percent discount on the valuation of new ventures from entrepreneurs compared to less reputable VCs.

To the best of knowledge, no study has directly investigated the impact of VCs on EM of entrepreneurial firms in a transitional and emerging market. Since the introduction of the SME and Venture Boards, there has been a significant increase of VC involvement in Chinese IPO firms. Lu et al. (2013) argue that VC activities in China are mainly driven by rent opportunities, and VCs are more opportunistic and

more likely to exit shortly after the lock-up period compared to those in developed markets (Liu et al., 2013). Cao, Liu, and Tian (2014) investigate VCs' monitoring of managerial behaviour regarding pay-performance relationship within the SME Board during 2004-2009. They document that government-funded VCs are less likely to monitor compared with non-government-funded VCs, and VCs' monitoring role is hampered in firms that experience severe controlling-minority agency problems. Due to the complex IPO regulations and the requirement of the CSRC's approval for listing on Chinese stock exchanges, the majority of VC-backed IPOs are backed by domestic VCs which have more local connections than their foreign counterparties²⁸ (Humphery-Jenner and Suchard, 2013). This study empirically examines whether VCs with PTs that are considered as more reputable play a better monitoring role within a weak institutional environment. Given the different incentives and motivations between government-controlled VCs and VCs with management-level PTs, we develop hypothesis separately for these two types of VCs.

3.2.3 Hypothesis development

3.2.3.1 Government-controlled VCs and EM

We expect that in China, companies backed by government-controlled VCs engage in upward EM to a greater extent than other IPO issuers for the following reasons. First, the incentives facing government-controlled VCs in mitigating informational problems might well be distorted. Government-controlled VCs are usually burdened with a variety of additional features or conditions that may seek to promote public or political

²⁸ Foreign VCs in China prefer to exit their investments in foreign stock markets (including Hong Kong Stock exchanges), since they are better connected with key intermediaries, more experienced and knowledgeable than are domestic VCs about developed markets (e.g. Humphery-Jenner and Suchard, 2013b; Tan et al., 2013). The sample of this study has less than 20 IPOs that have foreign VCs as lead VCs. The results remain unchanged when controlling for foreign VC backing.

objectives and thus have significant economic costs (Brander et al., 2008). For example, local government VCs are often susceptible to local government pressure to support startups whose risk and return prospects are not attractive (Zhang, Gao, White, and Vega, 2008). Top managers of these government VCs may have been appointed primarily to promote regional economic growth. Even when local government VCs invest in different provinces, they are likely to cooperate with local governments which again expose themselves to the pressure to support government-favoured companies (PE Daily, 2013). However, these companies may not be subject to rigorous auditing or reviews by the CSRC in going public process, which provides them with motives to falsify financial statements before or during the IPO (Li and Zhou, 2015).

Second, managers of government-controlled VCs generally have no ownership of the VC firm. The compensation to investment managers typically consists of fixed salary and bonuses which are determined by project performance. For example, if investment managers exit their investments through IPOs, they are able to receive a small portion of the net profits generated from exiting their investments²⁹ (carried interest of 2-5 percent). Under such circumstances, investment managers of government-controlled VCs may be motivated more by short-term gains than long-term performance.

Third, the government retains control over top management appointment decisions for government-controlled VCs. Many of these top managers are current or formal bureaucrats or SOE managers who may not have appropriate expertise in selecting and

²⁹ For example, executives of Shenzhen Capital Group (SCGC), a government-controlled VC firm, hold no shares. But they are able to receive 2 percent of net profits (carried interest) from their exit investments (PE Daily, 2013). For example, if SCGC invested 10 million RMB in a portfolio firm and exited its investment through IPO by 40 million RMB, the investment team will obtain 0.6 million out of the 30 million net profits as bonuses.

assisting entrepreneurial firms. However, their future career prospects are usually based on VC performance during their employment time (Aharony et al., 2000; Fan et al., 2007; Hung et al., 2012). Consequently, top managers have greater incentives to inflate their performance by encouraging EM of their portfolio firms at the IPO year.

The IPO lock-up expiration represents the first opportunity for VCs to sell their investments. Anecdotal and empirical evidence suggest that VCs cash out their holdings as soon as lock-up expiration so as to maximize the value of their shares (e.g., Caseres-Field and Hanka, 2001). In China, VC investors are typically subject to one-year lock-up period, within which they are not allowed to sell their shares. Given the nature of managerial incentives in government-controlled VCs, we further predict that VCs with ownership-level PTs that plan to sell immediately after the lock-up expiration are more likely to encourage income-increasing IPO-year EM.

Consequently, the following two related hypotheses are introduced:

H4. IPOs backed by VCs with ownership-level PTs engage in greater EM than do other IPO issuers.

H4a: The higher opportunistic IPO-year EM in companies backed by VCs with ownership-level PTs is positively related to VC lock-up sale.

3.2.3.2 VCs with management-level PTs and EM

Unlike government-controlled VCs, we anticipate that companies backed by VCs with management-level PTs engage in EM to a less extent than other IPO issuers. Compared with government-controlled VCs, VCs with management-level PTs can maintain autonomy while accessing valuable resources and good projects (Okhmatovskiy, 2010). They are less likely to be under government pressure to invest in

government-favoured industries/sectors. Compared with VCs without PTs, VCs with management-level PTs are more likely to receive recognition in the political media (Fan et al., 2007), enjoy greater success in transitional markets (Wang et al., 2013), and are more reputable, with a record of past performance (see Panel D of Table 3.1). Therefore, the grandstanding effect may be less evident in VCs with management-level PTs than VCs without PTs. Since top managers or general partners of these VCs are generally founders or hold partial ownership of the VC firm³⁰, they are more likely to maintain a longer-term orientation and value their reputation that has been earned over time.

Furthermore, VCs with management-level PTs are more likely to employ high-powered incentive compensation contracts. The major investment professionals are able to claim residual revenues and the compensation structure is a typical pay-for-performance one and market-oriented that is similar to the US practice (PE Daily, 2013)³¹. General partners or top managers generally work in a multi-divisional form that every partner has their own team composed of few investment managers (Guo, 2008). Their compensation and reputation are closely linked to the performance of their individual team. Thus, they are likely to concern more about the long-term success of IPOs that went public under their guidance, because this signals the market regarding their skills and quality in guiding new ventures. Consequently, they may have strong incentives to monitor the top management of new ventures they invested and ensure that severe EM behaviour does not occur. Given that these VCs have greater incentives to

³⁰ For example, Oriental Fortune Capital (OCF) was set up by the formal president of Shenzhen Capital Group (SCGC), a dominant municipal government-controlled VC firm. CDH investments, originally set up as a direct investment department of China International Capital Corporation Limited (CICC), is now an independent VC firm managed by Shangzhi Wu and Zhen Jiao.

³¹ General partners charge 15-20 percent of net profits as carrier interests and 1.5-2.5 percent as annual management fees.

protect their reputation, we further predict that the degree of EM in IPOs backed by VCs with management-level PTs is unrelated to VC lock-up sale one-year after the IPO.

Therefore, the following hypotheses are introduced:

H5. IPOs backed by VCs with management-level PTs engage in less EM than do other IPO issuers.

H5a: The lower IPO-year EM in companies backed by VCs with management-level PTs is not associated with VC lock-up sale.

3.3 Data, variables, and methodology

3.3.1 Data sources and sample distribution

Our sample consists of all IPOs listed on the SME and Venture Boards in the Shenzhen Stock Exchange (SZSE) from 2004 to 2012. Issuers on the main boards of the Shanghai Stock Exchange and SZSE are excluded as they are mostly large state-owned firms. Three financial service (CSRC industry code I) issuers are excluded since their financial disclose requirements and performances are significant different from other issuers. We also exclude 129 state-owned IPOs since a lower EM does not necessarily reflect the strong role of VC monitoring (Cao et al., 2014). The final sample includes 924 IPO issuers listed during 2004-2012.

The relevant data is extracted from the Wind database, and the China Stock Market and Accounting Research (CSMAR) database. VC related data is hand collected from IPO prospectuses and official VC websites. Specifically, the offer price, IPO issuing amount, underwriter and auditor information, and pre-IPO financial data are collected from the Wind database. Post-IPO trading price and financial data are taken from the

CSMAR. The characteristics of VC firms are hand collected from IPO prospectuses. Information from VC official websites is also used to complement the data regarding VC characteristics.

The hand-collected data include 924 entrepreneurial firms. First, we collect shareholders' names that contain keywords such as "venture", "investment", "VC investment", "limited partnership" from IPO prospectuses. Then we exclude so-called "venture" institutions that have close relationship with the controlling shareholder or chief managers as many of them are established to execute stock incentives schemes to the staff (Zhang and Li, 2011). We also exclude VC investors that are not in the top ten largest shareholders lists before the IPO in the CSMAR database since minority shareholder may not have significant impact on management decisions (Cao et al., 2014). IPO issuers that are backed by VCs owned by their lead underwriters are not referred to as VC-backed since the role of such VCs are different than other VCs³². After these controls, 399 IPOs are identified as VC-backed³³, among which 118 are backed by lead VCs with ownership-level PTs, 151 are backed by lead VCs with management-level PTs. Lead VC is identified as one made the largest investment. Following Fan et al. (2007) and Sun et al. (2011), we define VCs with ownership PTs as one controlled by the government, VCs with management PTs as one with its management team having social network ties with the government. Appendix B.1

³² The main results remain unchanged when we include IPOs backed by VCs that are owned by lead underwriters as VC-backed IPOs.

³³ This study uses a broad definition of VC and does not distinguish among venture capital or private equity. Since the private equity industry is relatively young, the Chinese PE mainly belongs to the growth capital. Entrepreneurial growth firms may include sectors other than those in the high-tech sector (Wright, 2007).

Table 3.1: Sample statistics

This table presents sample statistics for 924 IPOs listed on the SME and Venture Boards from 2004 to 2012. Panel A reports IPO issuer characteristics. Panel B shows the lead VC-related characteristics. All variables are defined in Appendix B.1. The differences in means are based on the independent t-tests. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: IPO firm characteristics

	Full sample	VC	Non VC	Diff	PTs	Without PTs	Diff	Ownership PTs	Management PTs	Diff
	[1]	[2]	[3]	[4]=[2]-[3]	[5]	[6]	[7]=[5]-[6]	[8]	[9]	[10]=[8]-[9]
Total Assets(RMB m)	612.050	600.330	620.957	-20.627	551.134	702.128	-150.994***	532.377	565.792	-33.415
Offer price(RMB m)	23.874	25.124	22.924	2.200**	24.965	25.452	-0.486	23.145	26.387	-3.242*
Gross proceeds (RMB m)	666.213	713.63	630.176	83.453***	687.605	767.479	-79.874	657.723	710.723	-53.233
Issuer age(years)	10.785	10.831	10.750	0.081	10.894	10.7	0.194	10.857	10.94	0.082
Initial returns	0.571	0.512	0.615	-0.103**	0.562	0.409	0.154	0.664	0.483	0.181*
Pre-IPO leverage	0.463	0.442	0.464	-0.022**	0.431	0.464	-0.032*	0.460	0.410	0.050***
ROA	0.148	0.147	0.148	-0.001	0.147	0.147	0.000	0.137	0.155	-0.018**
Growth in sales	0.428	0.387	0.458	-0.071	0.426	0.307	0.118	0.435	0.418	0.017
Auditor ranking	0.209	0.216	0.194	0.02	0.208	0.231	0.026	0.186	0.225	-0.039
Underwriter ranking	0.440	0.479	0.411	0.067**	0.476	0.485	-0.009	0.407	0.530	-0.123**
Largest ownership	0.492	0.460	0.518	-0.058***	0.452	0.478	-0.026	0.437	0.462	-0.026
CEO ownership	0.397	0.400	0.394	0.006	0.377	0.449	-0.073**	0.329	0.414	-0.086**
Venture Board	0.368	0.456	0.301	0.155***	0.468	0.431	0.038	0.424	0.503	-0.080

Panel B: Lead VC characteristics

	VC	PTs	Without PTs	Diff	Ownership PTs	Management PTs	Diff
	[1]	[2]	[3]	[4]=[2]-[3]	[5]	[6]	[7]=[5]-[6]
Rep. VC (Krishnan et al. 2011)	0.165	0.223	0.046	0.177***	0.279	0.179	0.101**
Rep. VC (Zero2IPO Research)	0.213	0.297	0.038	0.259***	0.347	0.258	0.089
VC age	5.608	6.341	4.09	2.251***	6.907	5.872	1.306*
VC on board	0.802	0.859	0.677	0.182***	0.889	0.834	0.055
Syndicate size	1.977	2.086	1.754	0.331***	2.102	2.073	0.029
VC duration	2.761	2.839	2.600	-0.238	3.263	2.507	0.756***
Lock-up sale	0.479	0.494	0.446	0.048	0.466	0.516	0.050
VC ownership before IPO	0.103	0.118	0.099	0.019	0.119	0.117	0.001
VC ownership after IPO	0.077	0.078	0.074	0.004	0.083	0.073	0.010
VC ownership 6 months after lock-up	0.064	0.065	0.061	0.004	0.072	0.060	0.012
VC ownership 12 months after lock-up	0.053	0.054	0.049	0.005	0.063	0.048	0.014*

presents the definitions of variables included in this study, and Appendix B.2 presents the sample distribution of the 924 IPOs by industry, year and region.

Table 3.1 provides descriptive statistics. Panel A reports IPO characteristics. Univariate tests are conducted to compare the characteristics of IPOs backed by VCs and those without VC backing, VCs with and without PTs, and VCs with ownership- and management-level PTs, respectively. VCs with PTs are associated with smaller firms and with lower CEO ownership. Compared with VCs with management PTs, VCswith ownership PTs are associated with IPO issuers with higher pre-IPO leverage, lower pre-IPO ROA, and lower level of ownership concentration. Consistent with developed market evidence (e.g., Lee and Wahal, 2004), VC-backed IPOs on average are associated with more reputable underwriters than non-VC-backed IPOs. Panel B presents lead VC characteristics of the sample. It shows that VCs with ownership PTs are older, more reputable as measured by prior market share of IPO exits, and invest in portfolio firms longer. VCs without PTs are much younger and less reputable than VC with ownership- and management-level PTs. Lastly, approximately half of VC-backed IPOs are subject to VC lock-up sale within six-month following VC lock-up expiration³⁴, and VC ownership at the different time is insignificantly different among IPO subsamples.

3.3.2 Measurement of EM

Prior EM studies focus on accounting accruals as the difference between reported earnings and cash flow from operations (OCF). Accruals include non-discretionary

³⁴ Approximately 20% of VC-backed IPOs are subject to three-year VC lock-up restrictions. As a robustness test, we re-run our main tables by using a subsample of VC-backed IPOs with 12 months lock-up period and non-VC-backed IPOs, and find that the results are qualitatively the same (see Appendices B.5-B.8).

accruals which are determined by firms' economic fundamentals, and discretionary accruals that are unrelated to fundamental factors. Following the extant literature (e.g., Chahine, Arthurs, Filatotchev, and Hoskisson, 2012; Lee and Masulis, 2011; Teoh et al., 1998a, b), we use the discretionary accruals obtained from a cross-sectional modified Jones (1991) model as the first measure for EM. Similar to Hribar and Collins (2002) and Liu and Lu (2007), we measure total accruals (TAC) using a cash flow approach:

$$TAC_t = NI_t - OCF_t \quad (3)$$

where NI_t is the net income in year t ; OCF_t is the cash flows from operating activities in year t . Then we use the cross-sectional modified Jones (1991) model. Specifically, we take the residual term from estimating the following regression:

$$TAC_t/TA_{t-1} = \alpha_0/TA_{t-1} + \alpha_1 PPE_t/TA_{t-1} + \alpha_2 (\Delta REV_t - \Delta AR_t)/TA_{t-1} + \varepsilon_t \quad (4)$$

where PPE_t is gross property, plant and equipment at the end of year t ; ΔREV_t is revenues in year t less revenues in year $t-1$; ΔAR_t is net receivables in year t less net receivables in year $t-1$; α_0 , α_1 , and α_2 are industry and year specific parameters; TA_{t-1} is the total assets in year $t-1$. To reduce heteroskedasticity, all variables in the regression are deflated by TA_{t-1} .

Equation (4) is estimated first by taking the data from all firms listed on the Chinese A-share markets matched on year and industry³⁵, but excluding the issuer and other IPO firms. Consistent with Chahine et al. (2012), we require each IPO firm have at least 10 industry-matched firms. α_0 , α_1 , and α_2 in Eq. (4) are obtained as firm-specific

³⁵ This study further divides IPOs firms in manufacturing industry (CSRC industry code C) into 10 groups based on the CSRC's one letter plus one digit industry classification. For example, C0, C1, and C2 are classified into different categories when calculating EM measures.

parameters to estimate the nondiscretionary accruals of each IPO firm. The residual term (ε) is the discretionary accruals (DAC) for each IPO firm and is used as a measure of EM. The DAC are winsorized at the 1st and 99th percentiles to reduce the outlier effect.

To obtain the second measure for EM, we use a performance matched abnormal accruals model based on Kothari et al. (2005). More specifically, each IPO firm is matched with a non-issuing firm in the same industry and calendar period and with the closest ROA to the IPO firm's pre-IPO year ROA. The performance matched abnormal accruals for a sample firm is the difference between the discretionary accrual of the IPO firm and the discretionary accrual for its industry-year-performance matched firm. We further winsorize the Kothari performance matched discretionary accruals at the 1st and 99th percentiles. The observations decrease from 924 to 741 primarily due to data limitations for IPO observations listed in 2012.

Figure 3.1 illustrates the timing convention. The fiscal year in which the company went public is year 0. Thus, fiscal year -1 ends before the date of the IPO, and fiscal year 0 includes both pre- and post-IPO information. The financial statement information (e.g., current accruals, total assets) for DAC_0 is taken from fiscal year 0. Using the similar process, we also calculate the modified Jones DAC at fiscal year -1 and 1, respectively. Fiscal year 0 has special significance since it is the period during which pre-IPO shareholders³⁶ who plan to sell their shares after the expiration of the lock-up are more likely to encourage income-increasing EM in an attempt to boost share prices.

³⁶ In China, the pre-IPO investors, directors, supervisors and the senior management of listed companies shall not transfer any shares of the company within a year of listing, whereas the controlling or the actual controlling shareholders shall not transfer their shares within 36 months after listing.

Figure 3.1: Timeline for portfolio firms going public

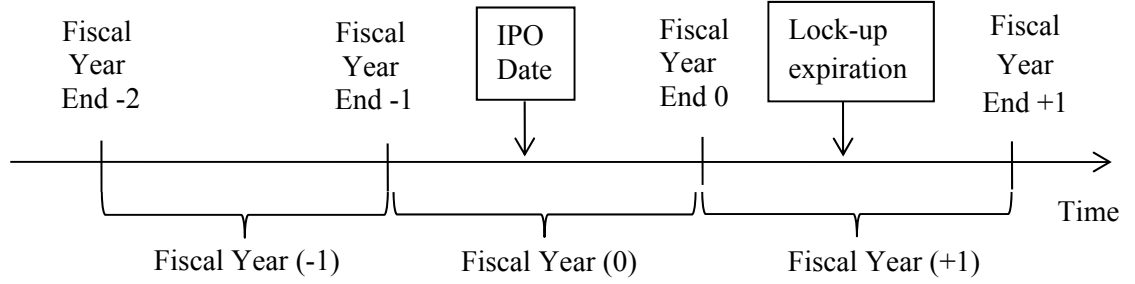


Table 3.2 reports the descriptive statistics for the two EM measures. Panel A presents univariate tests of DAC among different subsamples. The results show that IPO issuers listed on the SME and Venture Boards engage in severe income-increasing EM at fiscal years 0. The univariate tests show that IPOs backed by VCs with PTs show slightly lower DAC_0 obtained from the modified Jones model; however, such differences disappear when using the performance matched DAC_0 . When comparing DAC_0 between the two sub-groups of VC with PTs, VCs with ownership PTs exhibit significantly higher DAC_0 than VCs with management PTs. Appendix B.3 further shows that IPOs backed by VCs with management PTs exhibit the lowest DAC_0 among the four groups (ownership PTs, management PTs, VCs without PTs, non-VC-backed IPOs). Overall, the univariate analysis supports **H4** and **H5** that government-controlled VCs are associated with IPOs engaging in greater upward IPO-year EM, whereas VCs with management PTs tend to mitigate “bad” EM behaviour. While not the focus of the study, we find no severe pre-IPO year EM, with modified Jones DAC_{-1} statistically insignificant from 0. And there is upward EM at fiscal year 1, but it is at a significantly less degree than that in fiscal year 0.

Table 3.2: Univariate tests of discretionary accruals (% of total assets)

This table presents the univariate tests of discretionary accruals. Panel A reports the mean and median values of discretionary accruals (DAC) estimated from the modified Jones model at fiscal years -1, 0, and 1. It also presents the Kothari et al. (2005) performance matched DAC at fiscal year 0. Panel B presents the univariate tests of DAC between IPOs subject to VC lock-up sale and those not subject to VC lock-up sale. The differences in means and medians are based on the independent t-tests and Wilcoxon tests, respectively. Variable definitions are included in Appendix B.1. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Univariate tests of abnormal accruals

	Obs.	Full sample [1]	VC [2]	Non VC [3]	Diff [4]=[2]-[3]	PTs [5]	Without PTs [6]	Diff [7]=[5]-[6]	Ownership PTs [8]	Management PTs [9]	Diff [10]=[8]-[9]
<i>Modified Jones</i>											
Mean											
DAC ₋₁	923	0.007	0.014	0.002	0.012	0.015	0.013	0.001	0.022	0.008	0.014
DAC ₀	924	0.089	0.095	0.084	0.012	0.085	0.116	-0.031*	0.141	0.042	0.099***
DAC ₁	803	0.035	0.038	0.033	0.005	0.037	0.040	-0.003	0.045	0.030	0.015
Median											
DAC ₋₁	923	0.005	0.006	0.004	0.002	0.006	0.012	-0.006	0.011	-0.001	0.012
DAC ₀	924	0.063	0.066	0.062	0.004	0.061	0.096	-0.035**	0.105	0.029	0.076***
DAC ₁	803	0.024	0.021	0.025	-0.003	0.020	0.025	-0.005	0.022	0.019	0.003
<i>Performance matched</i>											
Mean											
DAC ₀	741	0.078	0.094	0.068	0.026	0.091	0.108	-0.017	0.150	0.040	0.110***
Median											
DAC ₀	741	0.094	0.107	0.085	0.023	0.104	0.115	-0.012	0.161	0.046	0.115***

Panel B: Univariate tests for DAC₀ of VC-backed IPOs that are subject to VC lock-up sale and not subject to VC lock-up sale

	VC			Ownership PTs			Management PTs		
	Sale [1]	No sale [2]	Diff [3]=[1]-[2]	Sale [4]	No sale [5]	Diff [6]=[4]-[5]	Sale [7]	No sale [8]	Diff [9]=[7]-[8]
<i>Modified Jones</i>									
Mean									
DAC ₀	0.113	0.079	0.035**	0.182	0.105	0.078**	0.051	0.031	0.020
Median									
DAC ₀	0.078	0.061	0.017*	0.135	0.083	0.052**	0.046	0.013	0.033
<i>Performance matched</i>									
Mean									
DAC ₀	0.100	0.090	0.010	0.168	0.127	0.041**	0.037	0.053	-0.016
Median									
DAC ₀	0.132	0.086	0.047**	0.210	0.117	0.094**	0.057	0.035	0.021

Panel B of Table 3.2 presents univariate analysis for DAC_0 of VC-backed IPOs that are subject to VC lock-up sale and those which are not subject to VC lock-up sale. Overall, the results show that IPO-year EM is higher for VC-backed IPOs that are subject to VC lock-up sale within six months following lock-up expiration. Such differences are more evident in IPOs backed by VCs with ownership PTs, but insignificant in IPOs backed by VCs with management PTs. This is consistent with **H4a** and **H5a** that IPO-year EM in companies backed by VCs with ownership PTs are positively related to VC lock-up sale, whereas IPO-year EM in companies backed by VCs with management PTs are not associated with VC lock-up sale.

3.3.3 Factors influencing EM

To further examine the association between VCs and IPO-year EM, we regress DAC_0 on the key variables of interest- government-controlled VCs (*Ownership PTs*) and private VCs with management-level PTs (*Management PTs*) - in multivariate regression models. More specifically, we estimate the following regression equations:

$$DAC_0 = \alpha + \beta_1 \text{Ownership PTs} + \beta_2 \text{Controls} + \varepsilon \quad (5)$$

$$DAC_0 = \alpha + \beta_1 \text{Management PTs} + \beta_2 \text{Controls} + \varepsilon \quad (6)$$

Our empirical models control for a number of factors commonly adopted in the EM literature. For IPO firm characteristics, *IPO age*, measured as the logarithm of issuer age, is included. Older firms usually have more established internal control and accounting systems and, therefore, are expected to have lower EM (e.g., Chahine et al., 2012). The model also controls for an issuer's gross proceeds. Firms that have higher financing amount are more likely to manage their earnings (e.g., Chen et al., 2013).

High leveraged firms have strong incentives to manage earnings to avoid debt covenant violations (DeFond and Jiambalvo, 1994), and thus a positive relation is expected between *leverage* and EM. Since issuers with greater growth potential are generally associated with higher discretionary accruals, we follow Chen et al. (2011) and use percentage change in sales from pre-IPO year to IPO year (*growth in sales*).

Furthermore, the models control for possible monitoring and certification effect of top auditors and prestigious underwriters. Top auditors and prestigious underwriters are better able and motivated to examine client firms, and thus better able to certify the reliability of their accounting reports (e.g., Brau and Johnson, 2009; Lee and Masulis, 2011). Therefore, a negative relation is expected between EM and reputation of IPO auditor and underwriter. *Auditor reputation* is measured as a dummy that is equal to one if the IPO firm hires the audit service of a top 6 auditor³⁷ in China, and zero otherwise. *Underwriter reputation* is also a dummy variable which equals to one if the lead underwriter is among the top 25% in Chinese markets, based on their cumulative market share one year before the IPO, zero otherwise.

The models also control for *largest shareholding*, which is measured as the percentage of shares held by the largest controlling shareholder. Liu and Lu (2007) argue that conflicts between controlling shareholders and minority investors are positively related to EM since EM facilitates controlling shareholders' tunneling activities. Lastly, year, region, industry and board fixed effects are controlled for the

³⁷ A mean of 2.2 % of our sample is audited by a Big Four auditor. The percentage of firms audited by Big Four auditors is relatively low in the SME and Venture Boards, when compared to 86.9% in the US market (Chahine et al., 2012) and 8.5% in the Main Boards of the Shanghai and Shenzhen Stock Exchanges in China (Chen et al., 2013). Our top 6 auditors are the Big Four (Deloitte, Ernst and Young, KPMG, PricewaterhouseCoopers) plus RSM International and BDO China Shu Lun Pan CPAs. Defining *Auditor reputation* on either Big Four or Top 6 produces similar empirical results on EM measures.

changing economic conditions, regional variations, differences across industries, and the two different listing boards (the SME Board and Venture Board) respectively. Since the majority of sample observations belong to the manufacturing and IT industries, the regression models only control for these two industries when running industry fixed effects.

Appendix B.4 reports the Pearson correlations between the variables used in this study. These correlation coefficients of independent variables are generally within a normal range, indicating that the variables are free of multicollinearity problems. We also check the variance inflation factors (VIFs) of the regression, and the results show that the maximum VIF for a variable is 3, suggesting that our empirical models are not significantly affected by multicollinearity issues.

3.4. Multivariate analysis

3.4.1 Multiple regression results of EM - Main hypotheses

This section employs multiple regression analysis to test the main hypotheses, after including all the control variables. The sample includes 399 VC-backed and 525 non-VC-backed IPO issuers listed during 2004-2012³⁸. Table 3.3 presents the OLS estimates where the dependent variable is DAC_0 , measured either by the modified Jones model (Panel A) or the Kothari performance matched abnormal accruals model (Panel B). By including other issuer characteristics, this model is better able to investigate the effects of VCs with PTs and VC lock-up sale on EM. In all the regression specifications, the

³⁸ Liu, Uchida, and Gao (2014) show that EM of Chinese IPO firms decrease after the introduction of a book building system in 2005. We find that the key results are qualitatively the same after excluding IPOs listed in 2004 from our sample.

Table 3.3: Estimates of VC associations with EM

This table presents the ordinary least squares (OLS) estimates for IPOs occurring during 2004-2012 in the SME and the Venture Boards. The dependent variable for Panel A is the IPO-year DAC estimated from the modified Jones model, and for Panel B is the IPO-year DAC estimated from the Kothari et al. (2005)'s performance matched abnormal accruals model. *VC subsample* stands for *VC dummy* in column 5, *ownership PTs* in column 6, *management PTs* in column 7, and *VC without PTs* in column 8. Other variable definitions are included in Appendix B.1. All regressions include year, industry, region and listing board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, ***represent statistical significance at the 10%, 5%, and 1% level respectively.

Panel A: Modified Jones Model

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
VC dummy	0.008 (0.442)					-0.008 (0.507)			
Ownership PTs		0.064*** (0.000)					0.030 (0.141)		
Management PTs			-0.062*** (0.000)					-0.070*** (0.000)	
VC without PTs				0.026 (0.106)					0.009 (0.673)
Lock-up sale					0.028** (0.042)				
Lock-up sale*VC subsample						0.035** (0.034)	0.074** (0.028)	0.017 (0.434)	0.038 (0.200)
IPO age	-0.018 (0.145)	-0.017 (0.165)	-0.019 (0.123)	-0.019 (0.137)	-0.017 (0.169)	-0.018 (0.148)	-0.015 (0.235)	-0.019 (0.115)	-0.018 (0.135)
Ln(Gross proceeds)	0.032*** (0.004)	0.034*** (0.003)	0.034*** (0.000)	0.032*** (0.005)	0.031*** (0.005)	0.033*** (0.003)	0.033*** (0.003)	0.036*** (0.001)	0.033*** (0.004)
Growth in sales	-0.010 (0.147)	-0.010 (0.152)	-0.011 (0.127)	-0.010 (0.156)	-0.010 (0.151)	-0.010 (0.146)	-0.010 (0.161)	-0.011 (0.121)	-0.010 (0.169)
Leverage	0.090** (0.012)	0.085** (0.016)	0.078** (0.028)	0.087 (0.016)	0.085** (0.016)	0.087** (0.014)	0.082** (0.020)	0.077** (0.029)	0.086** (0.016)
Auditor reputation	-0.009 (0.474)	-0.007 (0.551)	-0.008 (0.523)	-0.009 (0.731)	-0.007 (0.584)	-0.010 (0.146)	-0.006 (0.626)	-0.008 (0.531)	-0.009 (0.481)
Underwriter reputation	-0.006 (0.569)	-0.005 (0.654)	-0.003 (0.741)	-0.006 (0.557)	0.001 (0.919)	-0.006 (0.563)	-0.004 (0.683)	-0.004 (0.740)	-0.007 (0.544)
Largest shareholding	0.007 (0.716)	0.012 (0.547)	0.008 (0.675)	0.008 (0.692)	0.007 (0.699)	0.008 (0.696)	0.013 (0.509)	0.008 (0.675)	0.008 (0.685)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.044	0.061	0.063	0.047	0.051	0.049	0.068	0.064	0.049
Obs.	924	924	924	924	924	924	924	924	924

Table 3.3 (Continued)***Panel B: Performance matched model***

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
VC dummy	0.017 (0.238)					-0.006 (0.720)			
Ownership PTs		0.077*** (0.000)					0.036 (0.171)		
Management PTs			-0.058*** (0.002)					-0.070*** (0.009)	
VC without PTs				0.014 (0.525)					-0.005 (0.854)
Lock-up sale					0.045** (0.014)				
Lockup sale*VC						0.049** (0.028)	0.088** (0.025)	0.025 (0.453)	0.044 (0.300)
IPO age	-0.022 (0.181)	-0.020 (0.266)	-0.025 (0.184)	-0.024 (0.199)	-0.021 (0.264)	-0.021 (0.194)	-0.016 (0.373)	-0.025 (0.174)	-0.023 (0.204)
Ln(Gross proceeds)	0.033** (0.033)	0.034** (0.028)	0.034** (0.025)	0.033** (0.032)	0.034** (0.028)	0.034** (0.025)	0.032** (0.034)	0.034** (0.024)	0.034** (0.026)
Growth in sales	-0.003 (0.732)	-0.003 (0.724)	-0.003 (0.933)	-0.003 (0.732)	-0.003 (0.741)	-0.003 (0.725)	-0.003 (0.726)	-0.003 (0.718)	-0.003 (0.754)
Leverage	0.088* (0.086)	0.079 (0.116)	0.078 (0.130)	0.087* (0.090)	0.087* (0.091)	0.088* (0.086)	0.077 (0.125)	0.078 (0.130)	0.088* (0.090)
Auditor reputation	-0.022 (0.181)	-0.021 (0.321)	-0.022 (0.173)	-0.023 (0.173)	-0.020 (0.227)	-0.021 (0.194)	-0.020 (0.229)	-0.022 (0.179)	-0.023 (0.204)
Underwriter reputation	0.002 (0.872)	0.005 (0.759)	0.005 (0.736)	0.003 (0.856)	0.004 (0.811)	0.003 (0.857)	0.005 (0.722)	0.005 (0.729)	0.002 (0.872)
Largest shareholding	0.016 (0.469)	0.021 (0.321)	0.014 (0.507)	0.014 (0.521)	0.015 (0.489)	0.015 (0.498)	0.022 (0.304)	0.014 (0.524)	0.014 (0.523)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.069	0.085	0.077	0.068	0.076	0.076	0.092	0.078	0.070
Obs.	741	741	741	741	741	741	741	741	741

results mirror those in the earlier univariate analysis in Section 3.3.3. In columns 1-4 of Panels A and B, we find that for *ownership PTs*, the modified Jones model coefficient is 0.064, and the performance matched accruals coefficient is 0.077, suggesting that IPOs backed by VCs with ownership-level PTs exhibit abnormal accruals of 6.4-7.7 percent of total assets higher than other IPO issuers. On the other hand, IPOs backed by VCs with management-level PTs exhibit abnormal accruals of 5.8-6.2 percent lower than other IPO issuers. Thus, **H4** and **H5** are supported. While not the focus of this study, the regressions indicate that VCs and VCs without PTs have a positive but insignificant effect on EM.

To examine the effect of lock-up sale on IPO-year EM, we rerun the main tests and include a dummy variable, *lock-up sale*, which equals 1 if the VC sells any proportion of its holdings of the IPO firm within six months after the lock-up expiration and 0 otherwise. Then we interact *lock-up sale* with VC subsample variables including *VC dummy*, *ownership PTs*, *management PTs*, and *VCs without PTs*. The regression results are reported in columns 5-9 of Panels A and B, Table 3.3. In Column 5, the *lock-up sale* dummy is significantly positive, indicating that IPOs subject to immediate VC exit have higher abnormal accruals than other IPOs. The interaction variable is positively significant for *ownership PTs*, while insignificant for *management PTs*. *Ownership PTs* is no longer significant, while *management PTs* continues to be significantly negative. These results suggest that the higher DAC_0 in companies backed by VCs with ownership PTs is mainly driven by VC lock-up sale within six months following the lock-up expiration, whereas subsequent exits from VCs with management PTs are not associated with IPO-year EM. Therefore, **H4a** and **H5a** are supported.

With regard to control variables, the results show that the coefficients on gross proceeds and leverage are significantly positive and consistent with the literature. That is, IPOs that have greater financing amount and higher pre-IPO leverage are more likely to manage earnings upward. Other control variables are insignificant but with the majority of signs consistent with prior studies.

3.4.2 Robustness tests

3.4.2.1. Two-step approach

The results in Table 3.3 do not rule out the possibility that the statistical significance is driven by the endogeneity choice made by entrepreneurs and VC firms. Table 3.4 presents the regression results after adjusting for endogenous choice for VC financing. Following Lee and Wahal (2004) and Morsfield and Tan (2006), we employ a two-step procedure where the second-step regression uses the estimates from the first step to provide consistent estimates of the parameters. The dummy variable for *ownership PTs* and *management PTs* are replaced with the estimated probability of a firm being backed by a VC with ownership and management PTs, respectively, based on the first-step regression in the main regressions.

Results from the unadjusted regression are generally preserved after implementing the endogenous choice adjustments. The coefficient on *ownership PTs* is not significant when using modified Jones DAC_0 but positively significant when using performance matched DAC_0 as the dependent variable. The interaction between *ownership PTs* and *lock-up sale* remains positively significant, indicating that subsequent exits from VCs with ownership PTs result in higher IPO-year EM. *Management PTs* is significantly negative, both before and after controlling for VC lock-up sale. Overall, after

conditioning on the variables used to model the receipt of financing from VCs with ownership and management PTs, IPOs backed by government-controlled VCs exhibit higher DAC_0 , while firms backed by VCs with management-level PTs exhibit significantly lower DAC_0 than other IPO issuers. Subsequent VC lock-up sale is one of the main factors for the opportunistic IPO-year EM in companies backed by VCs with ownership PTs.

3.4.2.2 Propensity score matching

In addition to the two-step approach, we follow Lee and Masulis (2011) by controlling the endogeneity using the propensity score matching (PSM) approach. Lee and Masulis (2011) argue that though Kothari performance-matched DAC mitigate the bias in the estimation of treatment effects to some extent, this procedure may not go far enough if other factors also affect DAC and are not controlled for. They suggest that performance matching needs to be augmented by matching other characteristics as well. The PSM approach, designed for multi-dimensional matching, can not only account for all the important factors, but also address the potential selection bias (endogeneity) in the treatment effects by comparing the outcomes between treated and control subjects.

First proposed by Rosenbaum and Rubin (1983), the estimation of the average treatment effect on treated (ATT) follows a two-step process- first propensity scores of all the IPO issuers are estimated, and then IPOs receiving treatments are matched with a control group with similar propensity scores. In this study, the treatment variables are *ownership PTs* and *management PTs*. The issue characteristics in the first stage include *IPO age*, *log(gross proceeds)*, *leverage*, *growth in sales*, *auditor ranking*, *underwriter*

Table 3.4: Estimation of treatment effect based on the two-step approach

This table presents the second stage of a two-step regression process. The dependent variable for the second step is the IPO-year DAC defined as abnormal accrual estimated from either (i) a modified Jones model, or (ii) a Kothari et al. (2005)'s performance matched abnormal accruals model at fiscal year 0. *VC subsample* stands for *ownership PTs* in columns 2 and 6, *management PTs* in columns 4 and 8. Other variable definitions are included in Appendix B.1. All regressions include year, industry, region and listing board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, ***represent statistical significance at the 10%, 5%, and 1% level, respectively.

	Modified Jones				Performance matched			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Ownership PTs	0.056 (0.191)	0.013 (0.744)			0.253*** (0.004)	0.224*** (0.008)		
Management PTs			-0.120*** (0.000)	-0.128*** (0.000)			-0.156** (0.018)	-0.169** (0.013)
Lock-up sale*VC subsample		0.074** (0.025)		0.016 (0.428)		0.084** (0.027)		0.025 (0.438)
IPO age	-0.017 (0.156)	-0.014 (0.219)	-0.017 (0.157)	-0.018 (0.148)	-0.010 (0.596)	-0.006 (0.762)	-0.023 (0.207)	-0.024 (0.196)
Ln(Gross proceeds)	0.034*** (0.002)	0.033*** (0.003)	0.041*** (0.000)	0.041*** (0.000)	0.037** (0.010)	0.036** (0.012)	0.047*** (0.000)	0.047*** (0.000)
Growth in sales	-0.010 (0.145)	-0.010 (0.151)	-0.012* (0.087)	-0.012* (0.083)	-0.003 (0.734)	-0.003 (0.739)	0.001 (0.920)	0.001 (0.940)
Leverage	0.085** (0.015)	0.084** (0.017)	0.055 (0.128)	0.054 (0.133)	0.052 (0.315)	0.049 (0.343)	0.044 (0.392)	0.045 (0.391)
Auditor reputation	-0.008 (0.537)	-0.007 (0.600)	-0.007 (0.590)	-0.006 (0.428)	-0.017 (0.323)	-0.015 (0.368)	-0.022 (0.184)	-0.022 (0.191)
Underwriter reputation	-0.005 (0.644)	-0.005 (0.663)	0.001 (0.921)	0.001 (0.925)	0.011 (0.480)	0.011 (0.442)	0.011 (0.469)	0.011 (0.463)
Largest ownership	0.011 (0.566)	0.011 (0.552)	0.010 (0.600)	0.009 (0.600)	0.041* (0.073)	0.043* (0.059)	0.023 (0.292)	0.022 (0.305)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	924	924	924	924	741	741	741	741

Table 3.5: Estimation of average treatment effect on treated (ATT) based on PSM

This table presents treatment adjusted DAC evidence based on IPOs occurring during 2004-2012 in the SME and the Venture Boards. IPO-year EM is measured as abnormal accruals estimated from either (i) a modified Jones model, or (ii) a Kothari et al. (2005)'s performance matched abnormal accruals model at fiscal year 0. Other variable definitions are included in Appendix B.1. Three PSM techniques are used - nearest neighbourhood matching, Gaussian Kernel matching, and the stratification method. The endogenous choice of different types of VC financing is adjusted by using the control variables as instrumental variables in the first stage. Based on the parameters estimated in the first-stage probit regression, we then estimate the probability of different types of VC financing (treatments) and use this probability to match each treated firms to their non-treated counterparties with the closest probability measure. T-values are shown in brackets. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively. Matching is conducted with replacement and bootstrapped standard errors are used for statistical inference. The bootstrapped standard errors are based on 100 replications. Variable definitions are included in Appendix B.1.

Variable definitions are included in Appendix B.1.

		Obs.	Nearest Neighbour	Gaussian	Stratification
Matched variables: IPO age, gross proceeds, leverage, growth in sales, auditor ranking, underwriter ranking, largest shareholding, industry, region, and year dummies					
Modified Jones					
Ownership PTs	Sale	55	0.138*** (3.827)	0.101*** (3.125)	0.102*** (3.772)
	No sale	63	-0.001 (-0.048)	0.018 (0.925)	0.020 (1.038)
Management PTs	Sale	78	-0.028 (-1.133)	-0.041*** (-2.924)	-0.046*** (-2.916)
	No sale	73	-0.050* (-1.890)	-0.062*** (-4.727)	-0.063*** (-3.666)
VCs without PTs	Sale	58	0.031 (0.991)	0.047* (1.892)	0.041* (1.898)
	No sale	72	-0.018 (-0.677)	0.011 (0.509)	0.005 (0.230)
Performance Matched					
Ownership PTs	Sale	49	0.127** (2.661)	0.118*** (3.483)	0.119*** (3.723)
	No sale	54	0.026 (0.761)	0.026 (0.968)	0.028 (1.227)
Management PTs	Sale	51	-0.076* (-1.984)	-0.043** (-2.114)	-0.043* (1.813)
	No sale	52	-0.056 (-1.374)	-0.069** (-2.642)	-0.076** (-2.528)
VCs without PTs	Sale	44	-0.032 (-0.707)	0.041 (1.119)	0.033 (0.921)
	No sale	57	-0.011 (-0.274)	0.001 (0.057)	-0.009 (-0.328)

ranking, largest shareholding, Venture Board dummy, industry, region, and year dummies. Three different PSM methods are used: nearest neighbour, Gaussian kernel, and stratification. None of them is clearly superior to the others since these three matching methods involve tradeoffs between the number of matches and the quality of matching (e.g., Lee and Masulis, 2011).

Table 3.5 presents ATT of EM estimated from either the modified Jones model or the Kothari performance matched model. Consistent with earlier results, IPOs backed by VCs with ownership PTs and subject to VC lock-up sale engage in significantly higher EM than other IPO issuers. On the other hand, companies backed by VCs with management PTs are associated with lower EM, regardless of subsequent VC exits. These results confirm that endogeneity of the choices is not driving the overall support for the hypotheses in this essay.

3.4.2.3 VC ownership and EM

Chung, Firth, and Kim, (2002) argue that institutional investors with significant ownership are more likely to affect EM decisions of IPO issuers. Given the controlling-minority ownership structures in emerging markets, investors with small shareholdings are less likely to have a significant impact on the decision making of management teams. Thus, we define a “significant VC” (VCSIG) as 1 if the lead VC ownership is more than 5%³⁹ to measure the potential VC effect on EM. In Appendix B.9, we find that the results are consistent with the previous results. VCs with ownership PTs that have more

³⁹ We choose 5% as a threshold because in terms of information disclosure, regulations on the administration of the issuing and trading of shares (ITS) require that if a legal person holds directly or indirectly more than 5% of the common shares of listed company, a written report and disclosure must to be submitted to the listed company (Article 47). Also IPO prospectuses need to disclose the ownership and financial status information of legal persons which hold more than 5% of shares before issuing. We also follow Engel, Gurdon, and Hayes (2002) by using a 20% as a threshold and find similar results.

than 5% of shares before issuing are associated with IPOs engaging in higher EM, while VCs with management-level PTs are associated with IPOs engaging in lower EM than other IPO issuers.

3.4.2.4 VC characteristics and EM

Gompers (1996) argues that younger and less experienced VCs are more likely to prematurely bring their portfolio firms public in order to establish a successful track record. Baker and Gompers (2003) argue that VCs' presentation on board provides additional monitoring. Chahine et al., (2012) indicate that VC syndicate diversity increases pre-IPO DAC due to the increasing principle-principle agency conflicts. Lee and Masulis (2011) argue that reputable VCs reduce EM. To examine whether these VC characteristics affect the main results, we rerun Equations 5 and 6 with the sample of VC-backed IPOs only. Four VC characteristics variables - VC age, VC on board, syndicate size, Rep. VC - are added. Appendix B.10 shows that the four VC characteristics measures appear to have no impact on EM, for better or worse, while *ownership PTs* remain significantly positive and *management PTs* negatively related to EM.

3.5 VCs with PTs, lock-up sale, and long-run stock performance

The previous results consistently show that companies backed by VCs with ownership PTs are more likely to engage in severe IPO-year EM, whereas VCs with management-level PTs restrain an issuer's IPO-year EM. Prior studies provide evidence from developed markets that IPO issuers who manage earnings opportunistically have worse stock performance in the long run (e.g. Teoh et al., 1998b; Chahine et al., 2012).

Table 3.6: VC presence and cumulative abnormal returns (CARs)

Panel A presents univariate tests of cumulative abnormal returns (CARs) of different IPO subsample. Panel B presents univariate tests for CARs of different types of VC-backed IPOs that are subject to VC lock-up sale and not subject to VC lock up sale within six months after the lock-up expiration. Panel C presents treatment adjusted CARs. We adjust for the endogenous choice of different types of VC financing by using the control variables as instrumental variables in the first stage. Based on the parameters estimates in the first-stage probit regression, we estimate the probability of different type of VC financing (treatments) and use this probability to match each treated firms to their non-treated counterparties with closest probability measure. T-values are shown in brackets. *, **, ***represent statistical significance at the 10%, 5%, and 1% level, respectively. Matching is conducted with replacement and bootstrapped standard errors are used for statistical inference. The bootstrapped standard errors are based on 100 replications. Variable definitions are included in Appendix B.1.

Panel A: Univariate tests for CARs of IPOs backed by different VCs

	CAR1Y	CAR2Y
Full sample	-0.014	0.103
VC	-0.034	0.105
Non VC	0.003	0.101
Diff1=VC-Non VC	-0.037	0.004
PTs	-0.019	0.128
Without PTs	-0.067	0.056
Diff2=PTs- Without PTs	0.048	0.072
Ownership PTs	-0.071	0.005
Management PTs	0.021	0.225
Diff3=Ownership PTs-Management PTs	-0.092**	-0.220***

Panel B: Univariate tests for CARs of VC-backed IPOs that are subject to VC lock-up sale and are not subject to VC lock up sale

		CAR1Y	CAR2Y
VC	Sale	-0.052	0.063
	No sale	-0.019	0.143
	Diff=Sale-No sale	-0.033	-0.080*
Ownership PTs	Sale	-0.108	-0.077
	No sale	-0.038	0.076
	Diff=Sale-No sale	-0.070	-0.154*
Management PTs	Sale	0.037	0.186
	No sale	0.004	0.265
	Diff=Sale-No sale	0.032	-0.079
VC without PTs	Sale	-0.117	0.029
	No sale	-0.026	0.079
	Diff=Sale-No sale	-0.091*	-0.050

Panel C: Treatment adjusted CARs based on PSM

		Obs.	Nearest Neighbour	Gaussian	Stratification
CAR1Y					
Ownership PTs	Sale	55	0.004	-0.067	-0.051
			(0.070)	(-1.564)	(-1.128)
	No sale	63	-0.029	-0.022	-0.016
Management PTs	Sale	78	(-0.500)	(-0.516)	(-0.328)
			0.049	0.051	0.027
	No sale	73	(0.852)	(1.241)	(0.630)
			-0.098	0.000	-0.013
			(-1.647)	(0.009)	(-0.284)

Panel C of Table 3.6 (Continued)

		Obs.	Nearest Neighbour	Gaussian	Stratification
VCs without PTs	Sale	58	-0.047 (-0.780)	-0.110** (-2.568)	-0.106** (-2.401)
	No sale	72	0.025 (0.408)	0.003 (0.058)	0.014 (0.321)
CAR2Y					
Ownership PTs	Sale	55	-0.008 (-0.096)	-0.142** (-2.560)	-0.119** (-1.908)
	No sale	63	-0.045 (-0.487)	-0.026 (-0.390)	-0.027 (-0.401)
Management PTs	Sale	78	0.181** (2.213)	0.088 (1.417)	0.063 (1.150)
	No sale	73	0.024 (0.286)	0.145** (2.185)	0.112** (1.953)
VCs without PTs	Sale	58	0.024 (0.281)	-0.064 (-1.066)	-0.059 (-0.875)
	No sale	72	-0.002 (-0.019)	-0.001 (-0.008)	0.016 (0.239)

Following their studies, we continue to investigate the effects of *ownership* and *management PTs* on post-IPO stock performance. We calculated monthly abnormal returns as a particular issuer's monthly adjusted returns minus the monthly value-weighted market index returns. The Shenzhen Stock Exchange A-share index is used as the benchmark since indices' returns are generally highly correlated in the Chinese markets⁴⁰ while the SME Board index and the ChiNext index were not introduced until 2006 and 2010, respectively. The one- and two-year post-issue cumulative abnormal returns (CARs) are then calculated as the sum of the consecutive monthly abnormal returns using the month immediately after the month of IPO.

Panel A of Table 3.6 presents the univariate analysis of one- and two-year CARs for issuers backed by different VCs. The results show that companies backed by VCs with management PTs experience significantly higher one- and two-year CARs after issuing, while companies backed by VCs with ownership PTs experience lower one-year and two-year CARs than those backed by VCs with management PTs. Panel B

⁴⁰ We also use the SME index as the benchmark and lose the observations of IPOs listed before 2006, and we find that the key results remain the same.

presents the univariate analysis for CARs of VC-backed IPOs that are subject to VC lock-up sale and those that are not subject to VC lock-up sale. The results generally show that subsequent VC exits are associated with lower two-year CARs. Panel C presents the differences in CARs after adjusting for the endogenous choice of VC financing. Similarly, the results show that VCs with ownership PTs that exit partial of their shareholdings are associated with issuers having lower two-year CARs, whereas companies backed by VCs with management-level PTs exhibit better two-year CARs than other IPO issuers regardless of VC lock-up sale.

The main implications from these findings are that the well-known agency problems associated with significant government ownership (Shleifer, 1998) result in VC management's opportunistic behaviour in their portfolio companies. The management incentives of government-controlled VCs, on average, are not aligned with the interests of long-term shareholders with respect to EM decisions in an IPO context. However, VCs with management PTs, which are generally more reputable than VCs without PTs, have the incentives, monitoring abilities, and the necessary influence to reduce EM and improve post-IPO stock performance.

3.6. Conclusion

This essay analyses the impacts of VCs with different types of PTs on EM of 924 entrepreneurial firms in China. The results show that IPO issuers backed by VCs with ownership-level PTs exhibit severe income-increasing IPO-year EM. The opportunistic IPO-year EM is mainly driven by subsequent VC exits from the company. Such IPOs tend to experience long-run stock returns underperformance. On the other hand, the results show that IPOs backed by VCs with management-level PTs are associated with

lower EM and better long-run performance, suggesting that VCs with management-level PTs provide oversight of management activity and serve as effective monitors of IPO issuers. Despite a battery of robustness tests, the key results remain unchanged. The proxies for EM are cross-sectional modified Jones accruals and the Kothari performance matched abnormal accruals. Two-step and PSM approaches are used to control the endogenous choice of financing from VCs with ownership- and management-level PTs. We also consider the impact of the significance of VC ownership, and control for other lead VC characteristics.

CHAPTER FOUR

ESSAY THREE

This chapter presents the final essay of this thesis which investigates the effects of VC investors on the corporate governance, specifically the board structure, of Chinese initial public offerings (IPOs). Section 4.1 provides an overview of the study. Review of literature and the institutional background is undertaken in Section 4.2. Section 4.3 describes the data used in this study. Section 4.4 presents the empirical results on the determinants of board size and composition. Section 4.5 presents the impact of board structure and VC backing on firm performance, while Section 4.6 concludes. The chapter's appendices and references are presented in Appendix C and the Reference sections, respectively.

The impact of VC backing on the corporate governance of Chinese IPOs

Abstract: This study investigates how VC backing influences the size and composition of corporate boards in China. Using data from 924 IPO prospectuses, we find robust evidence that VC-backed IPOs have more independent boards, after controlling for CEO and firm characteristics, ownership, and the potential endogeneity concerns. Furthermore, VCs with management-level political ties (PTs) improve governance by using their networks to recruit specialist independent directors with industry relevant expertise. While no significant relationship is found between board independence and firm performance, we present some evidence that VCs with management PTs improve IPO performance, and IPOs that have a larger percentage of independent directors with industry relevant expertise exhibit higher long-term stock returns.

Keywords: Governance, Venture capital, Initial public offerings, China

JEL classification: G24, G32, G38

4.1. Introduction

Establishing effective corporate governance that protects minority shareholders is of great importance at the time of initial public offerings (IPOs), since the IPO represents the first time that most companies raise equity from dispersed investors. The transition from ‘entrepreneurial’ to ‘professional’ management (Daily and Dalton, 1992) requires a substantial effort. This includes preparing the IPO firm for the scrutiny of regulators and investment communities and, more specifically, establishing a corporate governance system that will comply with regulators’ rules (Filatotchev, 2006). IPO studies have increasingly recognized that among block shareholders, VC investors have a particularly strong impact on the process of corporate governance development due to their early involvement in the strategic development of entrepreneurial firms (Baker and Gompers, 2003; Carpenter et al., 2003). However, very little is known about whether VC investors are able to monitor and provide expertise to corporate boards in emerging markets, where ownership tends to be more concentrated and agency problems more severe due to weaker investor protection (e.g., La Porta, Lopez-De-Silanes, and Shleifer, 1999).

Using hand-collected data from IPO prospectuses, we describe the board size and composition for 924 small and medium enterprises (SMEs) listed on Chinese stock markets. Our empirical results shed light on the role of venture capital (VC) on the corporate governance of IPO firms in a transitional and emerging economy.

Prior studies in developed economies⁴¹ generally find that VC-backed IPOs have better board structures, with fewer insiders and quasi outsiders and more outside

⁴¹ An exception is Filatotchev (2006) which documents that the retained equity by VCs negatively affects board interdependence and non-executive directors’ interests in the UK.

(independent) directors (Baker and Gompers, 2003; Suchard, 2009). A venture capitalist does not simply increase board size or replace alternative independent directors and thus hold board size constant. This is consistent with the view that VCs add value to their portfolio firms, not only through cash infusions, but also through services such as active monitoring and oversight.

However, it is unclear whether the positive relationship between VC backing and board independence documented in developed economies can be generalized to China. Unlike US companies, Chinese listed companies are characterized by a high degree of ownership concentration, lower institutional ownership, and an inactive market for corporate control (Jiang and Kim, 2015). Moreover, like many developing countries, China suffers from a weak legal environment. Allen, Qian, and Qian (2005) compile legal system quality measures for China and find that China's creditor and shareholder protections are below average among LaPorta et al. (1998) countries. Kato and Long (2006) also contend that China lacks a comprehensive set of legal rules and enforcement regime that protect minority shareholders. Under such circumstances, large shareholders are more likely to play a critical role in board selection and less likely to choose directors that actively monitor the firm (Jiang and Kim, 2015). Furthermore, the VC market in China is relatively young, and prior research documents that differences exist regarding the way VC activities are practiced in China as opposed to the developed economies (e.g., Bruton and Ahlstrom, 2003; Tan et al., 2013; Lu et al., 2013). Thus, China provides an interesting and valuable setting for examining the role of VC investors in board structure.

This essay extends the literature beyond developed market evidence to the Chinese market and examines whether the differences in China's corporate governance environment and VC market have an impact on the contribution of VC firms to corporate governance practise. We focus on the role of VC backing on investee boards at the time of the IPO, and compare the corporate governance practices of VC-backed boards to a sample of non-VC-backed boards listed on the SME and Venture Boards of the Shenzhen Stock Exchange. Specifically, we examine the determinants of board size and composition and the role these board structures play in post-IPO stock performance. Board independence is considered and a broad definition of independence is used (beyond the definition of independent directors in the IPO prospectus⁴²). Following Suchard (2009), we use a broad measure of independent directors, which includes the independent directors as documented in the IPO prospectuses, and those who are not related to the controlling shareholders or management directors, were/are not employees, and have no business dealings with the IPO firm. We argue that a broader definition of independent directors is more relevant given the high ownership concentration of listed firms in Chinese markets. Directors who are also be minority shareholders of a firm may play a similar role as independent directors in monitoring and advising controlling shareholders, and reduce the high agency costs between majority and minority shareholders in China.

We also examine the role of directors who are not only independent but also have industry relevant expertise. Given the underdeveloped labour market and strong professional and social links of VC investors (Ahltrom et al., 2007; Jiang and Kim,

⁴² The Guidelines of the CSRC require that an independent director in the IPO prospectus cannot i) be related to managers, ii) have a business relationship with the firm, iii) have more than 1% of shareholdings of the firm, iv) be one of the top 10 shareholders.

2015), VCs may help entrepreneurial firms build cognitive capacity of the board by appointing outside directors with industry know-how and relevant expertise.

The results show that Chinese VC-backed IPOs generally have more (fewer) independent (non-independent) directors. The percentage of independent directors is 12% larger in firms backed by venture capital. Firms backed by VCs with management political ties (PTs) have more independent directors with industry relevant expertise than other firms. The results hold when we control for CEO and firm characteristics, ownership variables, and the endogeneity of VC financing. These further tests provide additional comfort that VC is playing a causal role in board structure rather than simply being a mirror of omitted firm characteristics. While this study finds no significant link between board independence and firm performance, it shows some evidence that VCs with management PTs improve IPO performance and firms with a higher percentage of independent directors with industry relevant expertise exhibit better performance.

This study contributes to the existing literature in several ways. First, it extends previous studies and sheds lights on the influences of VC investors on corporate governance in a transitional and emerging economy. Second, this study extends previous studies of VC-backed IPOs by linking VC backing with building the knowledge capacity of the board, along with its structural characteristics. It shows that VCs with management PTs and independent directors with relevant expertise contribute to better performance. Therefore, it is not simply the proportion of independent directors that lead to better performance, but the prior background of these members is a contributing factor. Third, unlike previous studies on board structure of Chinese listed firms (e.g., Liu et al., 2015; Jiang and Kim, 2015), this study uses a refined measure of

independent directors, rather than just the independent directors directly documented in the IPO prospectuses or proxy statements.

The rest of this paper is organised as follows. Section 4.2 presents institutional background, literature review and testable hypotheses. Section 4.3 describes the data. Section 4.4 discusses the empirical results on the determinants of board size and composition. Section 4.5 presents the impact of board structure and VC backing on firm performance, and Section 4.6 concludes.

4.2 Institutional background, literature review and testable hypotheses

4.2.1 Institutional background

Several internal and external governance mechanisms in the US - such as institutional ownership, the market for managerial talent and corporate control, and the composition of the board of directors - may discipline and provide incentives for managers to maximize shareholder wealth. However, the degree to which these mechanisms come to play varies dramatically across countries (e.g., Yeh and Woidtze, 2005; Black and Kim, 2012). In contrast to US companies, Chinese companies normally have a higher concentrated ownership structure, less transparent information disclosure, and poorer investor protection (Yu and Ashton, 2015). The stylized facts of important variables that relate to corporate governance may thus have limited effects in the Chinese markets (Jiang and Kim, 2015).

Corporate boards in China contain features of both the Anglo-American and the German boards while having its own characteristics (Tam, 2002). The governance system appears similar to Germany and Japan's two-tier board structure, in which

corporate boards are comprised of a board of directors and a supervisory board. However, these two systems are substantially different. In China, no hierarchical relationship exists between the board of directors and the supervisory board. Both are appointed by listed firms and report to shareholders' general meetings. Under the German-Japanese system, by contrast, the board of directors is appointed, may be dismissed, and is closely monitored by the supervisory board (Schipani and Liu, 2002). The Chinese supervisory board has been criticised for not performing its duties effectively, and it has been widely viewed to be more decorative than functional (Chen, Liu and Li, 2010; Huyghebaert and Wang, 2013). Consequently, corporate governance assessments have predominately focused on the board of directors, rather than the board of supervisors. Therefore, Chinese corporate board structure seems closer to the Anglo-Saxon one-tier type.

According to the Company Law and the Guidelines of the CSRC (2001), directors are elected to three-year terms but can serve consecutive terms. A listed firm is required to have a minimum of 5 directors and a maximum of 19 directors. The responsibilities of directors include convening meetings, implementing shareholder resolution, making major operational, investment, and financial decisions, and evaluating top managers. In extreme cases, directors may have to fire top managers. Managers are also allowed to be directors. A listed firm is not allowed to lend money to any of its directors or managers. Since June 2003, a minimum of one-third of a firm's board must be independent directors. The primary and legally explicit responsibility of independent directors is to monitor large controlling shareholders and top managers on behalf of minority shareholders.

However, the compulsory requirement may have complex effects. Chinese listed firms might select inactive independent directors simply to comply with the rules, which potentially drive a governance problem that Lin (2004) denominates “the inactive role of independent directors”. It is not uncommon in China that controlling shareholders of entrepreneurial firms manipulate the shareholders meeting and the boards of directors (Jiang and Kim, 2015). Large shareholders typically control the boards and management to ensure that decisions are aligned with their own interests (Lu, 2004). On this point, controlling shareholders can strengthen their control by selecting family members or associates as directors to make decisions in their favour. They often avoid employing independent directors to act as an extra monitoring role (Clarke, 2006).

4.2.2 Literature review and testable hypotheses

4.2.2.1 VC backing and board structure

Prior literature focuses on the impact of VC backing on board structure in developed markets. Baker and Gompers (2003) examine the US market between 1978 and 1987 and find that VC-backed IPOs have a better board structure, with fewer insiders and quasi outsiders and more independent outsiders. However, there are no strong links between VC backing, boards and firm outcomes but there is some weak evidence that VC-backed IPOs have a lower failure rate. Campbell and Frye (2009) examine governance at the IPO year as well as four years following the IPO. They extend the focus on board structure to create a monitoring index that includes other monitoring mechanisms such as ownership structure and executive compensation. They find that VC-backed firms have larger and more independent boards, and these VC-backed firms have governance structure with a higher level of monitoring at the time of the IPO and four years following the IPO. Non-VC-backed firms increase monitoring

following the IPO, while VC-backed firms on average decrease total monitoring. Suchard (2009) extends Baker and Gompers (2003) to the Australian VC market, and finds that Australian VC-backed IPOs have more independent directors with industry experience than non-VC-backed IPOs, suggesting that venture capitalists improve governance by using their networks to recruit specialist independent directors.

Baker and Gompers (2003) find that VC investors substitute for insider and quasi board members, fill the functional roles that other interdependent board members provide, and thus hold the board size of their portfolio firms constant. Similarly, Suchard (2009) finds that VC backing has no impact on the board size for Australian IPOs. Following their studies, we predict that there is no significant relationship between VC backing and board size.

While VCs improve board structure in developed markets, the impact of VC backing on board independence is relatively underexplored in emerging markets. Relative to the developed economies, ownership is more concentrated in China (e.g. LaPorta, et al, 1998, 1999). The large shareholders may not acquiesce or bend to an outside institutional investors' activism, given that VC investors are neither large shareholder at the firm-level, nor do they have long-run horizons (Jiang and Kim, 2015; Tan et al., 2013). However, China's private SMEs are struggling to access finance and investment since lending is prioritised to asset-rich SOEs. Private SMEs with few or no assets to be mortgaged by banks must turn to other financial organisations, especially VC investors. Learning from the US evidence, Chinese VCs have started to take an active role in the development of their portfolio firms, which includes requiring seats on the board and access to key managers' decisions as conditions of their investment (e.g.,

Gompers and Lerner, 2002; Guo, 2008; Guo and Jiang, 2015). Consequently, VC managers may improve corporate governance practices by influencing board composition and control. The mixed arguments, together with the unique characteristics of the Chinese corporate landscape, make it difficult to predict a priori incidence. Following developed market evidence, we hypothesize that VCs improve board independence of their backed IPOs.

The above discussion suggests the following two hypotheses related to VC backing and board structure (including board size and independence).

H6a: VC backing is not related to board size of IPO firms.

H6b: VC backing is positively related to board independence of IPO firms.

4.2.2.2 VC backing, board structure and firm performance

Some boards are found to be better monitors than others. For example, smaller boards perform a better monitoring role than other boards (e.g. Fama and Jensen, 1983; Yermack, 1996). Larger boards could be less effective due to coordination problems and director free-riding (Lipton and Lorsch, 1992; Jensen, 1993), which in turn lead to lower firm value (Yermack, 1996; Eisenberg, Sundgren, and Wells, 1998). Linck et al. (2008) argue that companies structure their boards in ways consistent with the costs and benefits of monitoring and advising by the board. Klein (1998) suggests that advisory needs increase with the extent to which the firm depends on the environment for resources. Larger firms usually have more external contracting relationships (Booth and Deli, 1996) and, thus, require larger boards (Pfeffer, 1972). Given that the sample observations included in this paper are SMEs, we predict that firms with smaller boards perform better.

It has always been a matter of dispute whether independent directors in China actively monitor large shareholders as they are in developed markets⁴³. There may be a substitution effect between internal and external governance mechanisms (Ferreira and Matos, 2008; Klapper and Love, 2004; Knyazeva, Knyazeva, and Masulis, 2013) such that monitoring from the independent (outside) directors is much more important in emerging markets where legal and extra-legal institutions provide weaker investor protections. Liu et al. (2015) find that board independence reduces tunnelling through inter-corporate loans and improves investment efficiency, especially in government-controlled firms. However, independent directors may play a limit role given the highly concentrated ownership structure in emerging markets. The Shanghai Stock Exchange (2004) reports that 70% of independent directors are nominated by firms' top shareholders. Wang (2014) summarizes the evidence from 30 empirical studies investigating the relationship between board independence and firm performance in China. He documents mixed results, with five (four) papers reporting a significantly positive (negative) relationship while the remaining twenty-one reporting an insignificant relationship. In this study, we follow the monitoring perspective of independent directors and predict that firms with more independent board have better IPO long-run performance.

H7a: IPO with smaller boards have better long-run performance.

H7b: IPOs with more independent boards have better long-run performance.

⁴³ See Yermack(1996), Hermalin and Weisbach (2003) for US based evidence that independent boards monitor the management and add value in some circumstances. Non-US country studies include Yeh and Woidtke (2005) for Taiwan, Black and Khanna (2007) for India, Dahya and McConnell (2007) for the U.K., and Choi et al. (2007) and Black and Kim (2012) for Korea.

While it is uncertain that independent directors are able to play an effective monitoring role, they may be able to provide other benefits (Hermalin and Weisbach, 2003; Wintoki, Linck, and Netter, 2012). An upper-echelon perspective (e.g., Carpenter and Westphal, 2001) argues that outside directors also constitute a critical organisation resource, particularly in young fast-growing firms (Daily and Dalton, 1992; Filatotchev, 2006). For example, if outside (independent) directors have political ties or industry relevant expertise, it can be helpful to the firm. Chen (2014) documents that firms that perceive weak protection of property rights have more outsiders on their boards, whereas a large part of these outsiders are former government officials and experienced managers from other companies. These firms have better corporate performance as measured by return on assets. Agarwal and Knoebel (2001) demonstrate that the percentage of outsiders with political connections on boards is related to the firms' need for political advice.

In a similar spirit, firms may appoint directors with relevant industry expertise because they need expert advice or important connections within the industry. Further, independent directors with relevant industry expertise are likely to reduce communication costs between management and non-management directors (Jensen, 1993). In other words, Chinese firms may strategically hire outside directors for help or advice other than to monitor top managers or controlling shareholders. Such external resources provided by outsiders are likely to add value to entrepreneurial firms, the majority of which are family controlled. Consequently, we hypothesize that IPOs backed by VCs with PTs and those with more independent directors with industry relevant expertise have better performance.

H7c: IPOs backed by VCs with PTs exhibit better long-run performance.

H7d: IPOs that have more independent directors with industry relevant expertise exhibit better long-run performance.

4.3 Data

Our sample covers the period from January 2004 to December 2012. The sample consists of 924 entrepreneurial firms listed on the SME and Venture Boards in the Shenzhen Stock Exchanges (SZSE). We obtain the year of the IPO, firm size, issuer age and pre-IPO financial data from the Wind database. Post-IPO trading prices are taken from the CSMAR. Details of board size, board composition, CEO characteristics (tenure, founder, dual), ownership, R&D propensity, and VC related information are hand collected from the IPO prospectus. Of the 924 firms we study, 399 IPOs are identified as VC-backed, among which 118 are backed by lead VCs with ownership-level PTs, and 151 are backed by lead VCs with management-level PTs. We identify lead VCs as one made the largest investment. Following Fan et al. (2007) and Sun et al. (2011), we define VCs with ownership PTs as one controlled by the government, VCs with management PTs as one with its management team having social network ties with the government. Appendix C.1 presents the definitions of variables used in this study.

Table 4.1 provides summary statistics for the sample. Board related variables are summarized in Panel A. Directors are classified as executives if they are senior executives of the firm. Directors are classified as non-independent if they are current or ex-employees, have business dealings with the firm, or are related (by family) to controlling shareholders or management directors. Studies in Chinese listed firms focus on the role of independent directors described as *dulidongshi* in the IPO prospectus or

Table 4.1: Summary statistics

This table presents the summary statistics for 924 Chinese entrepreneurial IPOs listed on the SME and Venture Boards during 2004-2012. All variables are defined in Appendix C.1.

	N	Mean	Median	Std	Min	Max
Panel A: Board composition						
Board size	924	8.546	9	1.479	5	15
# Exec	924	5.970	6	1.789	2	14
# Exec on board	924	2.614	3	1.052	0	6
% Non-indep directors	924	0.525	0.556	0.108	0.200	0.667
% Exec on board	924	0.307	0.333	0.115	0	0.571
% Quasi outsiders	924	0.218	0.222	0.137	0	0.600
% Indep	924	0.475	0.444	0.108	0.333	0.800
% Indep_prospectus	924	0.368	0.333	0.047	0.333	0.600
% Monitoring/Advising directors	924	0.107	0.111	0.106	0	0.444
% Indep indus exp	924	0.105	0.111	0.087	0	0.428
% Other indep	924	0.318	0.333	0.120	0	0.778
% VC on board	924	0.052	0.000	0.081	0	0.333
VC on board	320	0.346				
Panel B: CEO characteristics						
Age	924	46.591	46	6.963	27	72
Tenure	924	9.425	9.124	4.449	0.617	24.625
Founder	924	0.714	1	0.452	0	1
Dual	924	0.596	1	0.491	0	1
Panel C: Firm Characteristics						
Total assets (million)	924	600	415	590	113	3868
R&D intensity	913	0.041	0.036	0.031	0	0.236
ROA	924	0.148	0.135	0.071	0.032	0.396
Age	924	10.831	10.133	3.939	2.403	24.939
Panel D: Ownership						
Largest shareholding	924	0.493	0.459	0.181	0.070	0.968
CEO ownership	924	0.397	0.347	0.322	0	100
BOD ownership	924	0.692	0.728	0.207	0	100
Exe ownership	924	0.507	0.537	0.313	0	100
Indep ownership	924	0.019	0	0.057	0	0.480
VC ownership before IPO	399	0.103	0.083	0.072	0.008	0.529
VC ownership after IPO	399	0.077	0.062	0.053	0.000	0.397

Board size = number of directors.

Exec = number of executives.

Exec on board = number of executives on the board.

% Non-indep directors = percentage of the board that are related to the firm.

% Exec on board = percentage of executives on the board.

% Quasi outsiders = percentage of directors that are past or current employees, are related (by family) to controlling shareholders and management directors, or have business dealings with the firm.

% Indep = percentage of the board that are outsiders.

% Indep_prospectus = percentage of the board that are independent directors as described in the IPO prospectus.

% Monitoring/Advising directors = percentage of the board that are not described as independent directors in the IPO prospectus, were/are not employees, not related (by family) to controlling shareholders or management directors, have no business dealings with the firm.

% Indep indus exp = percentage of independent directors that have industry relevant expertise. This include related university degree or industry experience. For example, if the IPO is a bio-tech firm, an independent director is defined as having industry relevant expertise if he/she has a science degree or has had previously/currently worked in the same industry.

% Other indep = percentage of the board that are independent directors, have no industry relevant expertise, and are not venture capitalists.

% VC on board = percentage of the board that are venture capitalists.

VC on board = the number/percentage of IPO firms that are VC-backed.

VC ownership before IPO= percentage of shares owned by lead VCs before the IPO

VC ownership after IPO=percentage of shares owned by lead VCs after the IPO

proxy statements (e.g. Jiang and Kim, 2015). However, we follow Suchard (2009) and use a broader definition of independence by including monitoring/advising directors as independent directors. Monitoring/advising directors are defined as those who are not *dulidongshi*, are/were not employees of the IPO firm, have no business dealings with, and are not related to controlling shareholders or management directors.

The median board size in the sample is nine. This is the same as for all the Chinese listed firms discussed in Jiang and Kim (2015), but higher than that for the Australian IPOs (five) discussed in Suchard (2009) and the US IPOs (six) discussed in Baker and Gompers (2003)⁴⁴. Non-independent directors account for 52.5% of the board, 4.5 seats on average. This is similar to Australian IPOs, where insiders hold 49.4% of the board seats, 2.5 seats on average. Independent (outside) directors make up 47.5% of the board for Chinese listed SMEs, compared to 50.5% for Australian IPOs and 20.0% (2003) for US IPOs. The median size for the independent directors described in the IPO prospectus is 3, which is the same as in Jiang and Kim (2015). Monitoring/advising directors hold 1 seat on average. Independent directors with industry relevant expertise account for 10.7% of the board, which is significantly lower than 22.3% for Australian IPOs. Venture capitalists represent 5.2% of the board for all IPOs, which is slightly higher than 1.6% for Australian IPOs but lower than 11.0% for US IPOs.

The CEO characteristics from the IPO prospectus are summarized in Panel B of Table 1. CEOs have on average been with the firm for 9.4 years (median 9.1 years). When compared with US and Australian IPOs, Chinese CEOs of entrepreneurial firms are more likely to be a founder or a chairman of the firm. On average, 71.4% (59.6%) of

⁴⁴ The following evidence on the board structure of the US IPOs is from Baker and Gompers (2003), whereas that of Australian IPOs is from Suchard (2009).

CEOs are listed among the founders (chairman of the board) of the firm, which is higher than 55% (4%) for US IPOs and 35% (7%) for Australian IPOs. The percentage of CEO-Chairman dual is 59.6%, which is much higher than that documented in Jiang and Kim (2015), where the percentage of CEO-Chairman dual is around 14-28% for Chinese non-SOEs during 1999-2012. The higher percentage of CEO-founder and CEO-chairman dual is because our sample observations are privately-controlled SMEs.

Panel C of Table 4.1 shows firm characteristics. The average and median of total assets is RMB 600 million (approximately USD 97m) and RMB 415 million (approximately USD 70m), respectively. Firms are relatively small, with higher research and development (R&D) intensity and pre-IPO returns on assets (ROA) compared to other studies in Chinese stock markets (e.g., Liu et al., 2015). R&D intensity is the ratio of R&D expenses to operating revenue. Finally, Panel D shows the ownership structure of the firm. The largest shareholder owns 49.3% on average, compared to 39.7% for the CEO, and 69.2% for the board as a whole. VCs own 14.5% on average before the IPO, and 7.7% after the IPO.

Table 4.2 examines the differences in board composition, CEO and firm characteristics, and ownership between IPOs backed by VCs and those not backed by VCs, IPOs backed by VCs with PTs and VCs without PTs, and IPOs backed by VCs with ownership PTs and VCs with management PTs. Boards backed by VCs are slightly larger, 8.8 members vs. 8.4 members, similar to the US and Australian IPOs. Baker and Gompers (2003) argue that VC financing may lead to larger and more complicated firms, and thus require a larger board of directors for coordination. Among different

Table 4.2: Univariate statistics

This table examines the differences in board composition, CEO and firm characteristics, and ownership between IPOs backed by VCs and those not backed by VCs, IPOs backed by VCs with PTs and VCs without PTs, and IPOs backed by VCs with ownership PTs and VCs with management PTs. *, **, ***represent statistical significance at the 10%, 5%, and 1% level respectively. Variable definitions are presented in Appendix C.1.

	VC	Non-VC	Diff	PTs	Without PTs	Diff	Ownership PTs	Management PTs	Diff
	[1]	[2]	[3]=[1]-[2]	[4]	[5]	[6]=[4]-[5]	[7]	[8]	[9]=[7]-[8]
Panel A: Board composition									
N	399	525		269	130		118	151	
Board size	8.777	8.371	0.405***	8.814	8.700	0.114	9.110	8.583	0.527***
# Non-indep directors	4.148	4.760	-0.612***	4.097	4.254	-0.157	4.186	4.026	0.160
# Exec on board	2.632	2.600	0.032	2.584	2.731	-0.147	2.508	2.642	-0.134
# Quasi outsiders	1.516	2.160	-0.643***	1.513	1.523	-0.010	1.678	1.384	0.294**
# Indep	4.629	3.611	1.018***	4.717	4.446	0.271**	4.924	4.556	0.367***
# Indep_prospectus	3.150	3.084	0.067**	3.152	3.146	0.006	3.246	3.079	0.166***
# Monitoring/Advising directors	1.479	0.527	0.951***	1.465	1.300	0.265***	1.678	1.477	0.201*
# Indep indus exp	1.023	0.771	0.251***	1.078	0.906	0.170**	1.084	1.072	0.011
# VC on board	1.075	0.000	1.075***	1.156	0.908	0.248***	1.289	1.053	0.235***
% Exec on Board	0.300	0.312	-0.012	0.293	0.314	-0.021*	0.275	0.307	-0.032***
% Quasi outsiders	0.171	0.254	-0.082***	0.171	0.173	-0.002	0.182	0.162	0.019
% Indep	0.529	0.434	0.094***	0.536	0.513	0.023**	0.543	0.531	0.012
% Indep indus exp	0.118	0.094	0.024***	0.124	0.107	0.017*	0.119	0.127	-0.007
% Other indep	0.289	0.34	-0.051***	0.281	0.303	-0.021*	0.282	0.281	0.001
% VCs on board	0.121	0.000	0.121***	0.130	0.103	0.027***	0.141	0.122	0.019*
Panel B: CEO characteristics									
Age	46.333	46.787	-0.453	45.881	47.269	-1.388*	45.881	45.880	0.000
Tenure	9.623	9.275	0.347	9.656	9.555	0.100	9.502	9.775	-0.273
Founder	0.722	0.708	0.013	0.732	0.700	0.032	0.669	0.781	-0.112***
Dual	0.657	0.550	0.106***	0.643	0.685	-0.041	0.619	0.662	-0.044
Panel C: Firm Characteristics									
Total assets (M)	600.33	620.957	-20.627	551.134	702.128	-150.994***	532.377	565.792	-33.415
R&D intensity	0.045	0.037	0.007***	0.046	0.042	0.004	0.044	0.047	-0.003
ROA	0.147	0.148	-0.001	0.147	0.147	0.000	0.137	0.155	-0.018**
Age	10.831	10.750	0.081	10.894	10.7	0.194	10.857	10.94	0.082
Panel D: Ownership									
Largest shareholding	0.460	0.518	-0.058***	0.452	0.478	-0.026	0.437	0.463	-0.026
CEO ownership	0.400	0.394	0.659	0.377	0.450	-0.072**	0.328	0.414	-0.086**
BOD ownership	0.643	0.729	-0.084***	0.633	0.664	-0.031	0.603	0.656	-0.053**
Exec ownership	0.499	0.513	-0.013	0.478	0.544	-0.065**	0.424	0.521	-0.097***
Indep ownership	0.017	0.021	0.041	0.017	0.017	0.000	0.017	0.017	0.000

types of VC firms, IPOs backed by VCs with ownership PTs have larger boards than those backed by other VCs and the difference is statistically significant at 1 percent level.

In terms of board composition, both VC and non-VC backed firms have a similar number of executives on board, 2.63 members vs. 2.6. Boards of firms backed by VCs have fewer quasi outsiders and more independent directors than non-VC-backed firms. VC-backed IPOs have a higher percentage of independent directors with relevant industry expertise: 11.8% vs. 9.4%. These results are similar to the Australian and US IPOs and consistent with venture capitalists creating boards with greater independence and oversight. Further, Chinese VC-backed IPOs have a lower number and percentage of the board seats held by venture capitalists (1.1 or 12.1%) than US VC-backed IPOs (1.7 or more than 25% of the board).

Panel B of Table 4.2 shows that age and tenure of the CEO are similar across different types of firms. However, VC-backed firms have a higher percentage of boards with a dual CEO/Chairman than non-VC-backed firms (65.7% vs. 55.0%). Panel C shows that issuer size, age and pre-IPO ROA are similar between VC and non-VC-backed firms, but VC-backed firms have higher R&D intensity than non-VC-backed firms. In terms of ownership, VC-backed firms have lower ownership concentration and board director shareholding.

4.4 Empirical results: determinants of board structure

4.4.1 Determinants of the size and independence of the board

This study constructs the following baseline econometric models:

$$\begin{aligned} \text{Log (Board size)} = & \alpha + \beta_1 \text{ VC backing} + \beta_2 \text{ CEO characteristics} + \beta_3 \text{ Firm} \\ & \text{characteristics} + \beta_4 \text{ Firm ownership} + \beta_5 \text{ Board control} + \beta_6 \text{ Industry} \\ & \text{controls} + \beta_7 \text{ Year controls} + \varepsilon \end{aligned} \quad (7)$$

$$\begin{aligned} \% \text{ non-independent (independent)} = & \alpha + \beta_1 \text{ VC backing} + \beta_2 \text{ CEO characteristics} + \\ & \beta_3 \text{ Firm characteristics} + \beta_4 \text{ Firm ownership} + \beta_5 \text{ Board control} + \beta_6 \\ & \text{Industry controls} + \beta_7 \text{ Year controls} + \varepsilon \end{aligned} \quad (8)$$

where the variable *VC backing* indicates *VC dummy*, *Ownership PTs* or *Management PTs*. CEO characteristics include *CEO age*, *tenure*, and *founder*. Firm characteristics include *Total Assets*, *R&D intensity*, and *ROA*. Firm ownership variables include *largest shareholding* and *outsiderown*. The model also includes a listing board dummy variable in all of the regressions, since the listing board can be one important determinant of board size and independence. Industry and year controls are included. ε is the error term. Detailed definition of the variables can be found in Appendix C.1. Summary statistics are reported in Tables 4.1 and 4.2.

The regressions are based on ordinary least squares (OLS). Throughout, heteroskedasticity-consistent p-values are reported in brackets below the coefficients. The Pearson correlations in Appendix C.2 show that multicollinearity is not a major problem in this study.

Table 4.3: Determinants of board size (log)

This table presents the impact of VC backing on the board size of 913 Chinese IPOs listed on the SME and Venture Boards during 2004-2012. The dependent variable is the logarithm of board size. Variable definitions are included in Appendix C.1. All regressions include year, industry, Board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, ***represent statistical significance at the 10%, 5%, and 1% level respectively.

	[1]	[2]	[3]	[4]	[5]	[6]
<i>VC characteristics</i>						
VC dummy	0.026 (0.115)	0.026 (0.113)	-0.016 (0.475)			
Ownership PTs				0.052*** (0.004)	0.052*** (0.004)	0.025 (0.201)
Management PTs				0.002 (0.860)	0.004 (0.810)	-0.009 (0.602)
<i>CEO characteristics</i>						
CEO age	0.001 (0.690)	0.000 (0.576)	0.001 (0.539)	0.001 (0.469)	0.001 (0.509)	0.001 (0.687)
Tenure	0.001 (0.690)	0.001 (0.673)	0.001 (0.515)	0.001 (0.666)	0.001 (0.651)	0.001 (0.558)
Founder	-0.039*** (0.003)	-0.039*** (0.000)	-0.032** (0.014)	-0.038*** (0.004)	-0.037*** (0.004)	-0.032** (0.015)
<i>Firm characteristics</i>						
Total assets	0.037*** (0.003)	0.037*** (0.000)	0.042*** (0.000)	0.040*** (0.000)	0.039*** (0.000)	0.043*** (0.000)
R&D intensity	-0.213 (0.306)	-0.015 (0.497)	-0.071 (0.750)	-0.197 (0.339)	-0.001 (0.537)	-0.095 (0.664)
ROA	-0.090 (0.416)	-0.083 (0.454)	-0.016 (0.884)	-0.063 (0.561)	-0.057 (0.599)	-0.017 (0.876)
<i>Ownership</i>						
Largest shareholding	-0.185*** (0.000)	-0.189*** (0.000)	-0.191*** (0.000)	-0.184*** (0.000)	-0.186*** (0.000)	-0.185*** (0.000)
Outsiderown	0.077*** (0.000)	0.076*** (0.000)	0.076*** (0.000)	0.077*** (0.000)	0.075*** (0.000)	0.075*** (0.000)
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	Yes	Yes	No	Yes	Yes
Year fixed effects	No	No	Yes	No	No	Yes
N	913	913	913	913	913	913
R ²	0.118	0.120	0.145	0.123	0.125	0.147

4.4.2 Determinants of board size

This section examines whether VC backing affects board size of IPO firms. Table 4.3 presents the empirical results. Industry dummies are included in columns 2 and 4, and year dummies are further included in columns 3 and 6. Similar to Suchard (2009), we find no evidence that VC-backed IPOs have significant larger board size (columns 1-3). There is a positive relationship between ownership PTs and board size, but when controlling for year dummies, the coefficient is no longer statistically significant. This is consistent with Baker and Gompers (2003) and our **H6a** that VC backing is not related to board size of IPO firms.

As for the results on control variables, we find that board size is smaller when CEO is also the founder of the firm. Firms with greater total assets have larger board size. This is consistent with the scope of operation hypothesis, which argues that larger and more complicated firms have greater advisory needs and thus require larger boards (Boone, Field, Karpoff, and Raheja, 2007; Linck, Netter, and Yang, 2008; Coles, Daniel, Naveen, 2008). Firms with more concentrated ownership have smaller board size. These findings are consistent with the conjecture regarding the private benefits and bargaining power of controlling shareholders (e.g., Baker and Gompers, 2003). A positive relationship is found between outsider ownership dummy and board size. This result is similar to Raheja (2005), who argues that outside directors bring greater firm-specific information into the board's decision making and lead to more benefits of verification, which implies lower verification costs and larger boards.

4.4.3 Determinants of board composition

We next examine the impact of VC backing on board composition. In table 4.4, the dependent variables are listed in columns, and each column is a separate regression for the fraction of the board in each category. The results are presented for the total share as well as the percentage for each subcategory of non-independent and independent directors in Panels A and B, respectively. The control variables are the CEO and firm characteristics and ownership variables described in Section 4.4.1.

As shown in Table 4.4, the composition of the board in terms of the proportion of quasi outside directors and independent directors is affected by VC backing. The results for Chinese SME IPOs are similar to the US IPOs in Baker and Gompers (2003), where VC backing leads to a lower percentage of quasi outside directors and a higher percentage of independent directors. In terms of economic significance, VC financing reduces the fraction of quasi outsiders by 0.13 and reduces (increases) the fraction of non-independent (independent) directors by 0.12. In other words, VC backing improves board independence of IPO firms, and this is done mainly by reducing the fraction of quasi outsiders on board. Thus, **H6b** is supported.

Panel B of Table 4.4 further shows that VC backing has different impacts on the subgroups of independent directors. The coefficients on VC variables are all positively related to *% indep indus exp*, with only *management PTs* statistically significant. This suggests that VCs with management PTs are more likely to use their networks to recruit specialist independent directors that have a background in the same industry as the IPO firm. VC-backed firms have a lower percentage of independent directors that have no industry relevant expertise and are not venture capitalists (*% other indep*). The

percentage of independent directors that are described as *dulidongshi* in the IPO prospectus (*% indep_prospectus*) is similar between VC and non-VC-backed IPOs. However, the proportion of monitoring/advising directors (*% monitoring/advising*) is higher for VC-backed firms. This implies that simply using the percentage of independent directors from IPO prospectus underestimates the real proportion of independent directors on corporate boards.

With regard to control variables, the results show that the percentage of executives (insiders) increases with CEO age, CEO tenure, and firms with CEOs and founders as the same person. This provides some support for a theory of board composition as the outcome of a bargain between the CEO and outside shareholders (e.g., Hermalin and Weisbach, 1998). With more essential human capital, a longer-serving CEO has more power to control board composition. The percentage of independent directors with industry relevant expertise increases in firms with high R&D intensity. This implies that firms with more growth opportunity demand independent directors with similar background and experience. This is either to reduce communication cost or bring valuable expertise and potentially important connections to the firm. Large firms have a lower percentage of monitoring/advising directors and independent directors on board. A possible reason is that small firms are generally more risky and large shareholders allow more independent directors on board, attempting to signal their value to outside investors⁴⁵

⁴⁵ Anderson, Mansi, Reeb (2002) and Bhojraj and Sengupta (2003) find that firms with more independent boards are associated with lower costs of financing, implying that independent directors serve as a certification role for firms.

Table 4.4: Determinants of board composition

This table presents the impact of VC backing on the board composition of 913 Chinese IPOs listed on the SME and Venture Boards during 2004-2012. Panel A presents the determinants for the total share as well as the percentage of each subcategory of non-independent directors, whereas Panel B for independent directors. The dependent variables are listed in column, and each column is a separate regression for the percentage of the board in each category. Variable definitions are included in Appendix C.1. All regressions include year, industry, Board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, ***represent statistical significance at the 10%, 5%, and 1% level respectively.

<i>Panel A: Determinants of non-independent directors</i>						
	% Exec		% Quasi outsiders		% Non-indep	
	[1]	[2]	[3]	[4]	[5]	[6]
<i>VC characteristics</i>						
VC dummy	0.011 (0.480)		-0.126*** (0.000)		-0.115*** (0.000)	
Ownership PTs		-0.021* (0.096)		-0.036** (0.016)		-0.057*** (0.000)
Management PTs		0.001 (0.906)		-0.041*** (0.000)		-0.043*** (0.000)
<i>CEO characteristics</i>						
CEO age	0.001* (0.072)	0.001* (0.079)	-0.000 (0.403)	-0.001 (0.301)	0.000 (0.265)	0.000 (0.468)
Tenure	0.003*** (0.002)	0.003*** (0.002)	-0.004*** (0.000)	-0.004*** (0.000)	-0.001** (0.035)	-0.002** (0.018)
Founder	0.036*** (0.000)	0.036*** (0.000)	-0.046*** (0.000)	-0.048*** (0.000)	-0.010 (0.129)	-0.012* (0.075)
<i>Firm characteristics</i>						
Total assets	0.104* (0.082)	0.002 (0.791)	0.009 (0.189)	-0.010 (0.155)	0.012** (0.017)	0.012** (0.017)
R&D intensity	0.114 (0.426)	0.139 (0.309)	-0.413*** (0.000)	-0.557*** (0.000)	-0.299*** (0.000)	-0.419*** (0.000)
ROA	0.104* (0.082)	0.107* (0.075)	-0.042 (0.538)	-0.093 (0.166)	0.063 (0.204)	0.013 (0.792)
<i>Ownership</i>						
Largest shareholding	-0.005 (0.823)	-0.098 (0.640)	-0.027 (0.248)	-0.010 (0.679)	-0.032** (0.039)	-0.020 (0.225)
Outsiderown	-0.56*** (0.000)	-0.055*** (0.000)	-0.046*** (0.000)	-0.048*** (0.000)	-0.102*** (0.000)	-0.104*** (0.000)
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	913	913	913	913	913	913
R ²	0.105	0.107	0.211	0.171	0.365	0.325

Table 4.4 (continued)

<i>Panel B: Determinants of independent directors</i>								
	% Indep indus exp		% Other indep		% Indep_prospectus		% Monitoring/Advising	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
<i>VC characteristics</i>								
VC dummy	0.015 (0.204)		-0.031*** (0.035)		-0.006 (0.278)		0.131*** (0.000)	
Ownership PTs		0.016 (0.148)		-0.030** (0.023)		-0.004 (0.454)		0.061*** (0.000)
Management PTs		0.022** (0.028)		-0.033*** (0.007)		-0.005 (0.300)		0.048*** (0.000)
<i>CEO characteristics</i>								
CEO age	0.000 (0.322)	0.000 (0.267)	-0.000 (0.367)	-0.001 (0.196)	-0.000 (0.514)	-0.000 (0.475)	-0.000 (0.315)	-0.000 (0.697)
Tenure	0.001 (0.322)	0.001 (0.337)	-0.001 (0.385)	0.000 (0.613)	0.001** (0.017)	0.001** (0.017)	0.001 (0.334)	0.001 (0.257)
Founder	-0.000 (0.986)	-0.000 (0.948)	-0.009 (0.297)	0.004 (0.633)	0.001 (0.805)	0.001 (0.812)	0.012* (0.088)	0.011* (0.069)
<i>Firm characteristics</i>								
Total assets	-0.006 (0.168)	-0.006 (0.187)	-0.004 (0.480)	-0.006 (0.313)	-0.005** (0.047)	-0.005** (0.047)	-0.012** (0.014)	-0.007 (0.143)
R&D intensity	0.254** (0.029)	0.252** (0.029)	-0.056 (0.692)	-0.095 (0.497)	0.102* (0.079)	0.097* (0.092)	0.002* (0.092)	0.321*** (0.004)
ROA	-0.003 (0.955)	-0.001 (0.991)	-0.038 (0.541)	-0.026 (0.676)	0.031 (0.260)	0.029 (0.287)	-0.143*** (0.003)	-0.042 (0.365)
<i>Ownership</i>								
Largest shareholding	0.025 (0.136)	0.025 (0.128)	0.055*** (0.000)	0.005 (0.801)	0.038*** (0.000)	0.039*** (0.000)	-0.010 (0.529)	-0.019 (0.198)
Outsiderown	-0.006 (0.418)	-0.006 (0.391)	0.121*** (0.000)	0.117*** (0.000)	-0.016*** (0.000)	-0.016*** (0.000)		
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	913	913	913	913	913	913	913	913
R ²	0.055	0.059	0.212	0.288	0.090	0.090	0.281	0.409

4.4.4 Robustness tests

In the above analyses, we find that VC-backed IPOs have a better corporate governance structure, with a higher percentage of independent directors and a lower fraction of quasi outsiders. In addition, IPOs backed by VCs with management PTs have a higher percentage of independent directors with industry relevant expertise. However, the decision by a firm to raise venture capital and the decision of a VC firm to provide capital are not exogenous. Firm and CEO characteristics and firms' ownership structure may determine which firms are backed by venture capital. To address the endogeneity issue, we employ a two-stage approach. The ideal instruments are variables that increase the probability of VC backing but unrelated to the desired board structure.

In this study, we use two instruments for VC backing. The first is the governmental intervention development index (GIID) developed by Fan et al. (2009) and kindly provided by Liu et al. (2013). This index is a score measuring the level of market development. Entrepreneurial firms located in regions with better market development are more likely to receive VC financing. The second instrumental variable is the JZ dummy which equals to 1 if the portfolio firm is located in Jiangsu or Zhejiang province, and 0 otherwise. There are a large number of VC firms located in these two provinces and thus the probability of VC financing may be related to the location of the portfolio firm (Baker and Gompers, 2003).

The standard two-step least squares (2SLS) are used and the results are reported in Table 4.5. In column 1 of Panels A and B, we first use a probit model with all the control variables and the additional instruments of GIID and JZ dummy to predict the

Table 4.5: VC backing and board structure: Instrumental variable analysis

This table presents the IV regressions with governmental intervention development index (GIID) and location dummy (JZ) as instrumental variables. The dependent variables are listed in column. Variable definitions are included in Appendix C.1. All regressions include year, industry, Board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, ***represent statistical significance at the 10%, 5%, and 1% level respectively.

<i>Panel A: VC dummy and board structure</i>									
	First stage		Non-indep (%)			Indep (%)			
	VC Dummy	Board size	Exec	Quasi	Non-indep	Indep indu exp	Other indep	Indep_ prospectus	Monitoring/ Advising
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
<i>VC characteristics</i>									
VC dummy		-0.000 (0.999)	-0.033 (0.252)	-0.007 (0.816)	-0.040* (0.088)	0.034 (0.125)	-0.009 (0.740)	-0.003 (0.915)	-0.032 (0.194)
<i>Instrumental variables</i>									
GIID	0.001 (0.972)								
JZ	0.292*** (0.002)								
<i>CEO characteristics</i>									
CEO age	-0.006 (0.309)	0.003 (0.696)	0.001 (0.194)	-0.001 (0.384)	0.000 (0.709)	0.001 (0.138)	-0.001 (0.230)	0.000 (0.367)	-0.001* (0.201)
Tenure	0.005 (0.590)	0.024* (0.055)	0.003*** (0.001)	-0.004*** (0.000)	-0.002** (0.031)	0.000 (0.448)	0.000 (0.680)	-0.001 (0.341)	0.001* (0.084)
Founder	0.063 (0.519)	-0.125 (0.274)	0.038*** (0.000)	-0.049*** (0.000)	-0.010 (0.125)	-0.002 (0.800)	0.003 (0.680)	-0.009 (0.266)	0.017** (0.019)
<i>Firm characteristics</i>									
Total assets	0.148** (0.037)	0.336*** (0.000)	0.007 (0.350)	0.012 (0.117)	0.019*** (0.001)	-0.011** (0.037)	-0.038 (0.557)	-0.003 (0.656)	-0.011 (0.087)
R&D intensity	5.047*** (0.000)	0.931 (0.751)	0.3023 (0.133)	-0.568** (0.011)	-0.003 (0.126)	0.101 (0.527)	0.085 (0.663)	-0.090 (0.677)	0.569*** (0.000)
ROA	-0.620 (0.394)	-0.139 (0.878)	0.087 (0.156)	-0.106 (0.132)	-0.018 (0.721)	0.026 (0.632)	-0.038 (0.557)	-0.054 (0.414)	-0.104** (0.043)
<i>Ownership</i>									
Largest shareholding	-1.038*** (0.000)	-0.760*** (0.000)	-0.040 (0.268)	-0.010 (0.795)	-0.051* (0.077)	0.056** (0.043)	0.002 (0.965)	0.055*** (0.000)	-0.068** (0.025)
Outsiderown	-0.053 (0.636)	0.557*** (0.000)	-0.058*** (0.000)	-0.050*** (0.000)	-0.108*** (0.000)	-0.004 (0.626)	0.115*** (0.446)	0.120*** (0.000)	
Board fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	913	913	913	913	913	913	913	913	913
R ²	0.063	0.142	0.105	0.221	0.161	0.056	0.193	0.426	0.196

Table 4.5 (Continued)

<i>Panel B: VCs with PTs and board structure</i>									
	First stage		Non-indep (%)			Indep (%)			
	PTs	Board size	Exec	Quasi	Non-indep	Indep indu exp	Other indep	Indep_ prospectus	Monitoring /Advising
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
<i>VC characteristics</i>									
VCs with PTs		-0.000 (0.999)	-0.033 (0.252)	-0.007 (0.816)	-0.044* (0.078)	0.046** (0.025)	-0.057** (0.037)	-0.011 (0.318)	0.045* (0.087)
<i>Instrumental variables</i>									
GIID	-0.002 (0.955)								
JZ	0.275*** (0.005)								
<i>CEO characteristics</i>									
CEO age	-0.014** (0.032)	0.003 (0.696)	0.001 (0.194)	-0.001 (0.384)	-0.000 (0.707)	0.001** (0.028)	-0.001** (0.025)	-0.000 (0.274)	0.000 (0.674)
Tenure	0.007 (0.533)	0.024* (0.055)	0.003*** (0.001)	-0.004*** (0.000)	-0.002** (0.043)	0.000 (0.664)	0.001 (0.377)	0.001** (0.014)	0.001 (0.298)
Founder	0.077 (0.459)	-0.125 (0.274)	0.038*** (0.000)	-0.049*** (0.000)	-0.010 (0.162)	-0.002 (0.708)	0.006 (0.452)	0.001 (0.705)	0.012 (0.101)
<i>Firm characteristics</i>									
Total assets	0.027 (0.709)	0.336*** (0.000)	0.007 (0.350)	0.012 (0.117)	0.014*** (0.004)	-0.007 (0.133)	-0.004 (0.433)	-0.005* (0.056)	-0.016*** (0.003)
R&D intensity	4.014** (0.019)	0.931 (0.751)	0.302 (0.133)	-0.568** (0.011)	-0.291* (0.071)	0.000 (0.773)	0.148 (0.427)	0.148* (0.066)	0.217 (0.196)
ROA	0.027 (0.709)	-0.139 (0.878)	0.087 (0.156)	-0.106 (0.132)	-0.038 (0.492)	0.062 (0.300)	-0.102 (0.153)	0.014 (0.649)	-0.037 (0.503)
<i>Ownership</i>									
Largest shareholding	-0.979*** (0.000)	-0.760*** (0.000)	-0.040 (0.268)	-0.010 (0.795)	-0.051* (0.070)	0.025 (0.131)	0.007 (0.722)	0.039*** (0.000)	0.006 (0.840)
Outsiderown	0.018 (0.879)	0.557*** (0.000)	-0.058*** (0.000)	-0.050*** (0.000)	-0.105*** (0.000)	-0.007 (0.664)	0.117*** (0.000)	-0.016*** (0.000)	
Board fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	913	913	913	913	913	913	913	913	913
R ²	0.056	0.142	0.105	0.221	0.302	0.056	0.197	0.090	0.197

likelihood of VC backing. Then we rerun the OLS regressions in Table 4.4 using these predicted values.

As shown in columns 2-9 of Panels A and B, Table 4.5, the coefficients of VC dummy and PTs are negative and statistically significant in the regressions of non-dependent directors, suggesting that firms backed by VCs are more likely to have a smaller (larger) proportion of non-independent (independent) directors on board. The reduction in the level of significance of the predicted values from the 1% level to the 10 % level compared to the OLS estimates is attributable to the endogeneity problems. Further, the results show that IPOs backed by VCs with PTs have a significantly higher percentage of independent directors with industry relevant expertise on board, indicating that VCs with PTs are likely to help entrepreneurial firms appointing dependent directors with industry relevant expertise.

4.5 Board structure, VC backing, and firm performance

The above analyses show that VC-backed IPOs have similar board size as but more independent boards than non-VC-backed IPOs. Also, IPOs backed by VCs with management PTs have more independent directors with industry relevant expertise. In this section, we investigate the impact of VC backing and board structure (size and independence) on firm outcomes. Since the takeover and delisting markets⁴⁶ are inefficient in China, we capture the firm outcome of an IPO by its two-year cumulative abnormal returns (CAR2Y). The following models are constructed to study the effects of VC backing and board structure on IPO performance.

⁴⁶ Baker and Gompers (2003) find that VC backing reduces the probability of failure as measured by the probability of being liquidated or delisted. In contrast to US firm outcomes, Suchard (2009) finds that VC backing has no impact on firm failure for Australian IPOs. However, similar to the US IPOs, board composition at the time of the IPO has no impact on firm failure.

$$\begin{aligned} \text{CAR2Y} = & \alpha + \beta_1 \text{VC backing} + \beta_2 \text{CEO characteristics} + \beta_3 \text{Firm characteristics} \\ & + \beta_4 \text{Ownership} + \beta_5 \text{Board control} + \beta_6 \text{Industry controls} + \beta_7 \text{Year} \\ & \text{controls} + \varepsilon \end{aligned} \quad (9)$$

$$\begin{aligned} \text{CAR2Y} = & \alpha + \beta_1 \text{Board structure} + \beta_2 \text{CEO characteristics} + \beta_3 \text{Firm} \\ & \text{characteristics} + \beta_4 \text{firm ownership} + \beta_5 \text{Board control} + \beta_6 \text{Industry} \\ & \text{controls} + \beta_7 \text{Year controls} + \varepsilon \end{aligned} \quad (10)$$

The regression results are reported in Table 4.6. We find a significant negative relationship between board size and CAR2Y, indicating that firms with larger boards have poorer stock performance (column 1). This is consistent with the argument that smaller boards are better at monitoring. Thus, **H7a** is supported. Column 2 shows that board independence is insignificantly related to IPO performance, implying that independent directors are unlikely to play an active monitoring role in China. This is inconsistent with **H7b** that board independence is positively related to IPO long-run performance. **H7c** argues that IPOs backed by VCs with PTs exhibit better long-run performance. We find that neither VCs with PTs nor VCs with ownership PTs have significant effects on CARs; however, IPOs backed by management PTs experience significantly better stock performance (see columns 5 and 6). Thus, our **H7c** is partially supported. Column 3 presents evidence consistent with our prediction that firms that have a higher percentage of independent directors with industry relevant expertise exhibit higher CARs (column 3). Thus, **H7d** is supported. Column 7 further shows that VCs with ownership PTs that have a higher percentage of independent directors with

Table 4.6: Board structure, VC backing, and post-IPO performance

This table presents the effect of board structure and VC backing on post-IPO performance. The performance of an IPO firm is measured by its two-year cumulative abnormal returns (CAR2Y). Variable definitions are included in Appendix A. All regressions include year, industry, Board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, ***represent statistical significance at the 10%, 5%, and 1% level respectively.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
<i>VC characteristics</i>							
Board size	-0.304*** (0.002)	-0.279*** (0.005)	-0.280*** (0.004)	-0.301*** (0.002)	-0.305*** (0.002)	-0.291*** (0.003)	-0.283*** (0.003)
% Indep		0.005 (0.979)					
% Indep indus exp			0.400** (0.038)				0.187 (0.412)
VC dummy				0.103 (0.134)			
PTs					0.061 (0.209)		
Ownership PTs						-0.042 (0.463)	-0.251*** (0.004)
Management PTs						0.136** (0.015)	0.167** (0.045)
Ownership PTs*% Indep indus exp							1.715*** (0.002)
Management PTs*% Indep indus exp							-0.257 (0.593)
<i>CEO characteristics</i>							
CEO age	-0.004* (0.063)	-0.004* (0.054)	-0.004* (0.054)	-0.004* (0.060)	-0.004* (0.072)	-0.004* (0.070)	-0.004* (0.063)
Tenure	0.005 (0.185)	0.004 (0.218)	0.005 (0.213)	0.004 (0.219)	0.005 (0.205)	0.005 (0.195)	0.005 (0.174)
Founder	0.028 (0.430)	0.029 (0.421)	0.029 (0.418)	0.025 (0.475)	0.027 (0.460)	0.023 (0.529)	0.028 (0.432)
<i>Firm characteristics</i>							
Total assets	-0.082*** (0.003)	-0.080*** (0.004)	-0.080*** (0.004)	-0.080*** (0.004)	-0.080*** (0.004)	-0.083*** (0.003)	-0.081*** (0.003)
R&D intensity	0.194 (0.966)	0.083 (0.904)	0.085 (0.900)	0.034 (0.959)	0.118 (0.860)	0.084 (0.899)	0.006 (0.992)
ROA	-0.068 (0.813)	-0.069 (0.811)	-0.069 (0.811)	-0.117 (0.689)	-0.078 (0.787)	-0.117 (0.689)	-0.113 (0.698)
<i>Ownership</i>							
Largest	-0.019 (0.825)	-0.023 (0.788)	-0.023 (0.788)	0.001 (0.988)	-0.008 (0.929)	-0.016 (0.859)	-0.024 (0.779)
Outsiderown	-0.002 (0.966)	-0.002 (0.967)	-0.001 (0.973)	-0.005 (0.943)	-0.004 (0.920)	-0.006 (0.892)	-0.005 (0.910)
Board fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	913	913	913	913	913	913	913
R ²	0.101	0.105	0.103	0.102	0.111	0.125	0.126

industry related expertise have better performance, while those with a lower percentage have poorer performance. IPOs backed by VCs with management PTs have better performance regardless of the proportion of independent directors with industry relevant expertise. These findings are consistent with Chen (2014) that Chinese firms strategically hire independent directors for help or advice, and independent directors provide other benefits other than monitoring.

Summing up, this section estimates the effects of VC backing and board structure on corporate performance. We find evidence that firms with smaller boards experience higher stock returns. Board independence does not have an impact on firm outcome; however, VCs with management PTs improve firm performance, and firms with a greater proportion of independent directors with industry relevant expertise exhibit better performance.

4.6 Conclusion

Using data from 924 IPO prospectuses, this analysis provides insights on the role that venture capitalists play beyond providing capital in a transitional economy. Generally, this study finds that boards of VC-backed IPOs have better corporate governance, with a higher percentage (number) of independent directors on board. IPOs backed by VCs with PTs, particularly those by VCs with management PTs, have a higher percentage of independent (outside) directors with industry relevant expertise. These results hold when we control for CEO and firm characteristics, ownership structure, and the endogeneity of VC financing. Thus, for Chinese IPOs, VC backing affects board independence as well as the percentage of independent directors with industry relevant expertise. VCs with PTs use their networks to recruit specialist

independent directors that have a background in the same industry as the firm. Finally, this study finds no relationship between board independence and post-IPO performance. However, we find that VCs with management PTs improve IPO performance, and firms with a greater proportion of independent directors with industry relevant expertise have better performance.

CHAPTER FIVE

CONCLUSION

This chapter concludes the thesis by providing a summary of the key findings and implications for each of the three essays in Section 5.1, and identifying potential areas for future research in Section 5.2.

5.1 Major findings and implications

5.1.1 Essay one: Political ties and VC exits: Evidence from China

The first essay examines whether PTs benefit VCs by using a dataset of 2578 portfolio firms that received their initial VC funding during the period from 2004 to 2010. The hypotheses and conclusions in connection with the Research Aim 1 are summarized in Table 5.1. The results from the logit and Cox hazard models indicate that PTs increase the likelihood of a successful exit, indicating support for our **H1**. Lu et al. (2013) argue that institutional instabilities and government behaviour in transitional and emerging economies create many unique sources of rents that are not available in developed markets, and it is VCs' capability to capture economic rents from institutional environment that distinguish them from each other. Due to the young VC industry and the absence of stable institutional regime in China, VCs may divert their resources to build and maintain PTs to reduce uncertainty and seek rents from China's institutional environment.

The finding that PTs facilitate VCs' successful exits also supports the argument that PTs, as a type of social network ties, matter for entrepreneurial investments in

transitional economies. Recent institutional theorists argue that informal social arrangements, particularly social network ties, can have equally important and lasting consequence as formal institutions such as private property rights (Dixit, 2004; Xin and Pearce, 1996; Peng and Luo, 2000). Our finding that PTs add value to VC firms echoes with the corporate PTs literature that PTs are able to facilitate property rights protection (Zhou, 2013), help access to valuable information and resources controlled by the government (e.g., Chen et al., 2011; Li and Zhou, 2015), and thus add value to firms within transitional and emerging economies (e.g., Wu et al., 2013; Francis, Hasan, and Sun, 2009).

Although previous studies recognize the existence of different strengths and structure of PTs (Sun et al., 2012), there has been a lack of empirical research directly testing their divergent values on VC exits. Consistent with the political connections and incentives hypotheses, this essay finds that VCs with management-level PTs enjoy greater success than those with ownership-level PTs due to the agency problems associated with direct government ownership. Unlike Wu et al. (2013) who find that central PTs have greater positive effects than local PTs, this essay finds no different impacts of central and local PTs on VC exits. Thus, **H3** is not supported.

Table 5.1: Hypotheses and conclusions for research aim 1

Research Aim 1: To investigate whether PTs add value to VCs in a transitional and emerging market of China, where government influence is strong and market-supporting institutions are underdeveloped.

<i>H1</i>	<i>PTs facilitate successful VC exits, particularly through mainland IPOs and M&As.</i>	<i>Supported</i>
<i>H2</i>	<i>VCs with ownership-level PTs have less positive effects on VC exits than VCs with management-level PTs.</i>	<i>Supported</i>
<i>H3</i>	<i>Local PTs have greater positive effects on VC exits than central PTs.</i>	<i>Not supported</i>

5.1.2 Essay two: VC political ties and IPO earnings management: Evidence from China

The second essay examines the first part of research aim 2 regarding whether VCs add value to the public equity market by constraining EM of their portfolio firms. This question is empirically tested by using a dataset of 924 IPOs listed on the SME and Venture Boards in China. The two EM measures used in this study are discretionary abnormal accruals (DAC) obtained from modified Jones (1991) model and Kothari et al. (2005) performance matched model. Hypotheses and conclusions in connection with the first part of research aim 2 are summarized in Table 5.2. The cross-sectional regression results show that IPOs backed by VCs with ownership-level PTs exhibit abnormal accruals of 6.4-7.7 percent of total assets higher than other IPO issuers, indicating support for **H4** that VCs with ownership-level PTs are more likely to encourage EM of their portfolio firms. On the other hand, IPOs backed by VCs with management-level PTs exhibit abnormal accruals of 5.8-6.2 percent lower than other IPO issuers. This is consistent with **H5** that VCs with management-level PTs constrain severe EM of their portfolio firms. This essay also shows that VCs and VCs with PTs as a whole have no significant impact on EM decisions of their backed firms.

This essay further demonstrates that the higher IPO-year EM in IPOs backed by VCs with ownership-level PTs is mainly driven by the VC lock-up sale within six months following VC lock-up expiration. VCs with ownership-level PTs that plan to sell immediately after the lock-up expiration are more likely to encourage income-increasing EM, which in turn leads to poor long-run performance. Thus, **H4a** is supported. However, the lower EM in IPOs backed by VCs with management-level PTs

is not associated with VC lock-up sale, and these IPOs perform better in the long-run. Thus, **H5a** is also supported.

Table 5.2: Hypotheses and conclusions for research aim 2 (part one)

Research Aim 2: To investigate whether VCs, particularly VCs with PTs, add value in China's public equity market.		
<i>H4</i>	<i>IPOs backed by VCs with ownership-level PTs engage in greater EM than do other IPO issuers.</i>	<i>Supported</i>
<i>H4a</i>	<i>The higher opportunistic IPO-year EM in companies backed by VCs with ownership-level PTs is positively related to VC lock-up sale.</i>	<i>Supported</i>
<i>H5</i>	<i>IPOs backed by VCs with management-level PTs engage in less EM than do other IPO issuers.</i>	<i>Supported</i>
<i>H5a</i>	<i>The lower IPO-year EM in companies backed by VCs with management-level PTs is not associated with VC lock-up sale.</i>	<i>Supported</i>

The main implications from these findings are that different groups of VCs face different incentives with respect to monitoring EM decisions of their backed IPOs. VCs with management-level PTs have strong incentives to protect their reputation by restraining EM. However, the agency problems in government-controlled VC firms (Shleifer, 1998) result in VC management's opportunistic behaviour in their portfolio companies. Since top managers of government-controlled VCs generally hold no shares and their compensation typically consists of fixed salary and bonus which is determined by project performance, they are motivated more by short-term gains than long-term performance. Thus, this essay suggests that the incentive mechanisms for top managers in government-controlled VCs need to be modified to better align top managers' interests with the long-term success of government-controlled VCs and their portfolio firms. To ensure the long-term development of the VC market, Chinese policymakers should moderate direct government intervention in its VC markets. Instead, they can encourage privately-controlled and foreign VCs to invest in young entrepreneurial firms by placing incentive structure, introducing favourable policies for early-stage investments, or strengthening enforcements in laws and regulations. To reduce EM and

protect outside investors' interests, rigorous regulations and disclosure rules are needed to provide explicit evidence for detecting and penalizing misreporting behaviours.

5.1.3 Essay three: The impact of VC backing on the corporate governance of Chinese initial public offerings

The final essay of this thesis examines the second part of research aim 2 regarding whether VCs add value to the public equity market by improving the board structure of their portfolio firms. Hypotheses and conclusions in connection with the second part of research aim 2 are summarized in Table 5.3. With data hand collected from IPO prospectuses, this essay finds that VC backing is unrelated to board size, and VC-backed IPOs have more independent boards, after controlling for CEO and firm characteristics, ownership, and the potential endogeneity concern. Thus, **H6a** and **H6b** are supported.

In addition, this essay finds evidence consistent with **H7a** that firms with smaller boards perform better in the long run. However, there is no evidence that firms with more independent boards have better IPO performance. Thus, **H7b** is not supported. This paper also extends previous studies of VC-backed IPOs by linking VC presence with the knowledge capability of independent directors. The results show that VCs with management PTs are more likely to use their networks to recruit specialist independent directors with industry relevant expertise. Further, this essay presents some evidence that firms that have a larger percentage of independent directors with industry relevant expertise exhibit higher long-term stock returns, and among VCs with PTs, those with management PTs improve IPO performance. Thus, **H7c** is partially supported and **H7d** is supported.

The main implications from these findings are that VCs improve the board structure of their investees by requiring more independent directors on board. However, these independent directors are less likely to play an effective monitoring role. This is consistent with the argument that large controlling shareholders or top management are less likely to allow outside directors who actively monitor their behaviour on board (Lin, 2004; Jiang and Kim, 2015). Our results that VCs with management-level PTs and firms with more independent directors with industry relevant expertise have better performance, indicate that independent (outside) directors are able to provide other benefits such as access to external resources via their networks of contacts and expert advice to entrepreneurial firms. While previous developed market research often associates board independence with more effective monitoring and control of managerial discretion, in the context of SMEs within a less developed market, emphasis may be placed on the resources or connections of the board.

Table 5.3: Hypotheses and conclusions for research aim 2 (part two)

Research Aim 2: To investigate whether VCs, particularly VCs with PTs, add value in China's public equity market.		
<i>H6a</i>	<i>VC backing is not related to board size of IPO firms.</i>	<i>Supported</i>
<i>H6b</i>	<i>VC backing is positively related to board independence of IPO firms.</i>	<i>Supported</i>
<i>H7a</i>	<i>IPO with small boards have better long-run performance.</i>	<i>Supported</i>
<i>H7b</i>	<i>Board independence is positively related to IPO long-run performance.</i>	<i>Not supported</i>
<i>H7c</i>	<i>IPOs backed by VCs with PTs exhibit better long-run performance.</i>	<i>Partially supported</i>
<i>H7d</i>	<i>IPOs that have more independent directors with industry relevant expertise exhibit better long-run performance.</i>	<i>Supported</i>

5.2 Limitations and future areas of research

This thesis has several limitations that may suggest directions for future research. First, constrained by data, this thesis has adopted binary PT measures that are unable to measure the quantities and strength of PTs. In addition, these measures do not include indirect/weak PTs such as political connections of friends and/or families of VC management teams that may also be useful (Granovetter, 1973; Faccio, 2006). Future research can apply a more refined measure - one that measures both the quantity and strength of PTs - to capture these effects, as in the social network literature (e.g., Burt, 1992).

Second, since the data used in all the three essays are cross-sectional in nature, there is a potential problem of endogeneity. While this thesis attempts to minimize the possibility of selection (whereby VCs only invest in firms with better performance or governance) by using the two-stage and propensity score matching approaches, this thesis cannot completely rule out the possibility that some of the results are due to the selection or sorting effects.

Third, due to data limitation, this thesis does not include PTs of underwriters or auditors, which may impact firm performance (e.g., Liu et al., 2013; Yang, 2013). Chen et al. (2013) imply that underwriters with different characteristics tend to have different target clients and state-owned firms are more likely to hire state-owned underwriters. Similarly, VCs with PTs may have more association with politically connected underwriters and auditors and thus hire them for entrepreneurial firms. If this is the case, the binary measure of PTs used in this thesis may have already captured those ties of underwriters and auditors. As richer data becomes available, future research can

disentangle this issue through examining the interacting effect of PTs among different related parties or comparing their effects on firm performance.

The first essay of this thesis highlights that PTs, as one aspect of social capital of VCs, facilitate VCs' successful exits in a transitional and emerging market. While this study shows that PTs add value to VCs, future research could examine the role of other types of social network ties in facilitating VC exits. Furthermore, as this essay investigates the impact of PTs on the likelihood of successful exits via IPOs, one may wonder how PTs affect the speed of approval by the CSRC. Constrained by data, this essay has no information on the exact date VCs submit their IPO applications and the date their portfolio firms receive approval from the CSRC. Since the key focus of this essay is on whether PTs affect VC exits, the impacts of PTs on the speed of the CSRC approval can be examined by future research.

The second essay injects empirical evidence into the controversy supporting whether the interests of VCs with PTs are aligned or are in conflict with those of other shareholders with respect to EM decisions in an IPO context. However, this paper examines only one aspect of communications that new issuers have with the financial markets, namely through financial statements issued and filed with the CSRC. The notion of financial reporting quality can also be extended to other forms of communications used by new issuing firms, such as through new releases (both mandatory and voluntary) apart from financial statements. A more complete study could examine whether IPO firms exhibit similar manipulative tendencies with voluntary financial and non-financial disclosures as they do in their reporting of earnings, and how VCs play a role in those reporting and disclosure settings. In addition, this essay

uses IPO-year abnormal accruals to capture the aggressive financial reporting before the IPO lock-up expiration. A more precise way would be to use the fiscal quarter abnormal accruals immediately preceding the lock-up expiration date⁴⁷. Lastly but not the least, this essay uses accrual-based measures to capture earnings manipulation. In addition to accrual manipulation, companies can manage earnings upward by altering real activities such as manipulating sales and/or cutting discretionary expenses (e.g., Roychowdhury, 2006; Cohen and Zarowin, 2010; Braam, Nanday, Weitzel, and Lodh, 2015). How VCs affect managers' decisions over real activities manipulation⁴⁸ can be examined by future research.

The final essay of the thesis implies that both academics and investors need to identify 'which players are involved and why' (Pettigrew, 1992, p.178) on the board of firms. While this study provides some evidence of VCs on board structure and the knowledge capacity of independent directors, future research can link executive characteristics (e.g., executive directors' experience, prestige, networks, etc) with board structure. However, it is beyond the ambitions of this study to open the 'black box' of top management research and analyze how top management play a role in developing the board of entrepreneurial firms. Furthermore, due to the static nature of this research, this study cannot validate various stages of board development process in an IPO firm. Previous research argues that the process of firms going public incorporates a number of stages, with creating an efficient executive team being a priority at the early stage and recruiting experienced non-executive directors as firms grow and approach their IPO 'threshold' (e.g., Carpenter et al., 2003; Filatotchev, 2006). Further research based on

⁴⁷ Due to data limitation, we will lose a great number of observations if we use the quarterly financial data to calculate the fiscal quarter abnormal accruals.

⁴⁸ Real activities manipulation is defined by Roychowdhury (2006) as "...management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings threshold".

longitudinal case studies of small entrepreneurial firms may shed light on stages and processes involved in the board development.

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APPENDIX A

FOR ESSAY ONE

Appendix A.1: Definitions and data sources of variables

Variables	Data sources	Definitions and measurement
<i>Dependent variables</i>		
VC exits	Wind, ChinaVenture, Licaicom	1= the VC-backed portfolio firm went public or was acquired before 31st December 2014, 0=otherwise.
Time-to-exit	Wind, ChinaVenture, Licaicom	The number of years between the date of VC's first investment in a portfolio firm and either (a) the date of exit if the investment is exited, or (b) 31 st December 2014 if the investment is not yet exited.
<i>Independent variables</i>		
PTs	IPO prospectuses, VC websites, ChinaVenture, relevant media reports	1=the VC firm is controlled by the government, or the management team has social network ties with the government (e.g., having at least one former government official, former/current member of the People's Congress, or former/current member of the People's Political Consultative Conference), 0= otherwise.
Central ownership PTs	IPO prospectuses, VC websites	1= the VC firm is controlled by the central government, 0=otherwise.
Local ownership PTs	IPO prospectuses, VC websites	1= the VC firm is controlled by a local government, 0=otherwise.
Central management PTs	IPO prospectuses, VC websites, relevant media reports	1= the management team of a VC has social network ties with the central government (e.g., having at least one former government official, former/current member of the People's Congress, or former/current member of the People's Political Consultative Conference at the central government level), 0= otherwise.
Local management PTs	IPO prospectuses, VC websites, relevant media reports	1= the management team of a VC has social network ties with the local government (e.g., having at least one former government official, former/current member of the People's Congress, or former/current member of the People's Political Consultative Conference at the local government level), 0= otherwise.
Rep. VC	Wind, ChinaVenture, Licaicom	1= the VC firm belongs to the top quartile of VCs based on their past three-year IPO market share at the time of initial VC funding, 0=otherwise
VC age	Wind, Investide, Licaicom	The number of years between a VC's establishment date (or the date a VC investing in China for the first time for foreign VCs) and the investment date in a portfolio firm.
Institutional VC indicator	Wind, ChinaVenture	1=the VC firm is an institutional VC, 0=otherwise.
Portfolio firm age	Wind	The number of years between a portfolio firm's establishment date and VC's investment date in this portfolio firm.
Syndicate size	Wind, ChinaVenture, Licaicom	The number of VC firms investing in the portfolio firm.
Joint investment	Wind, ChinaVenture, Licaicom	1=if at least one foreign VC and one domestic VC invested in the portfolio firm, 0=otherwise.
Domestic IPO condition	Wind, ChinaVenture	The lagged quarterly number of IPOs in Mainland China prior to a portfolio firm's exit. For investments yet to exit, it is the average of the lagged quarterly number of IPOs over the entire period starting from the investment date.
Domestic M&A condition	Wind, ChinaVenture	The lagged quarterly number of M&As in Mainland China prior to a portfolio firm's exit. For investments yet to exit, it is the average of the lagged quarterly number of M&As over the entire period starting from the investment date.
Big 3 cities	Wind	1= the portfolio firm locates in Beijing, Shanghai, and Shenzhen; 0=otherwise.
Headquarters	Wind	1= if the lead VC is a domestic VC, 0=otherwise.
<i>Instrumental variables</i>		
GIID	Fan et al. (2009) Liu et al. (2013)	The governmental intervention development index. A lower (higher) GIID indicates more (less) government intervention.
JZ	Wind	1=the portfolio firm locates in Jiangsu or Zhejiang, 0=otherwise.

Appendix A.2: VC firm distribution sorted by PTs

This table displays the distribution of VCs firms sorted by whether they have PTs and the types and levels of PTs they have.

Sample	All VCs	Domestic VCs	Foreign VCs
Column	[1]	[2]	[3]
With PTs	85	79	9
Central ownership PTs	4	4	0
Local ownership PTs	39	39	0
Central management PTs	21	15	6
Local management PTs	24	21	3
Without PTs	111	37	74
Total	199	116	83

Appendix A.3: The distribution of successful exits sorted by investment and exit year, and by headquarters of VC firms

Sample	Total				Domestic			Foreign		
Exit routes	All exits	IPO mainland	IPO foreign	M&A	IPO mainland	IPO foreign	M&A	IPO mainland	IPO foreign	M&A
Column		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Panel A: Investment year										
2004	75	17	22	36	17	5	19	0	17	17
2005	66	15	25	26	15	12	12	0	13	14
2006	93	26	41	26	25	10	10	1	31	16
2007	138	90	17	31	83	2	16	7	15	15
2008	112	60	21	31	55	12	19	5	9	12
2009	78	52	11	15	48	5	10	4	6	5
2010	94	67	12	15	59	6	11	8	6	4
Total	656	327	149	180	302	52	97	25	97	83
Panel B: Exit year										
2004	1	0	1	0	0	0	0	0	1	0
2005	13	0	8	5	0	4	3	0	4	2
2006	21	4	8	9	4	4	4	0	4	5
2007	64	17	29	18	16	9	9	1	20	9
2008	41	16	8	17	16	1	9	0	7	8
2009	75	35	15	25	30	3	15	5	12	10
2010	154	91	40	23	86	18	13	5	22	10
2011	130	87	15	28	84	1	16	3	14	12
2012	67	52	3	12	44	1	5	8	2	7
2013	42	0	8	34	0	3	20	0	5	14
2014	48	25	14	9	22	8	3	3	6	6

Appendix A.4: Pearson correlations

This table presents the Pearson correlations among variables used for the first essay. All variables are defined in Appendix A.1. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

	A	B	C	D	E	F	G	H	I	J
(A) VC exits	1	0.136***	0.016	-0.071***	0.042**	0.135***	0.292***	0.085***	-0.433***	-0.054***
(B) PTs		1	0.093***	0.303***	0.011	0.175***	-0.049**	-0.054***	0.052***	0.023
(C) Rep. VC			1	0.410***	0.156***	-0.033*	0.054***	0.060***	-0.058***	-0.036*
(D) VC age				1	0.153*	0.055***	-0.027	-0.016	0.013	0.166***
(E) Institutional VC indicator					1	-0.012	0.011	0.042**	-0.022	-0.050**
(F) Portfolio firm age						1	-0.026	-0.068***	-0.054***	-0.067***
(G) Syndicate size							1	0.379***	-0.015	-0.120***
(H) Joint Investment								1	-0.054***	-0.067***
(I) Domestic IPO condition									1	0.014
(J) Domestic M&A condition										1

Appendix A.5: Binary logit model of VC exits

This table presents the logit models of different types of successful exits. The dependent variables are listed in columns, and each column is a separate regression. IPO mainland is coded as 1 for mainland IPO exits and 0 otherwise. IPO foreign and M&A is coded as 1 for foreign IPO exits and M&A exits, respectively. Panel B replaces PTs with the four subgroups of PTs and reruns the regression. The variable definitions are in Appendix A.1. Intercepts are not reported. Brackets contain robust p-values clustered by lead VC firms. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

Sample Exit routes	Total			Domestic			Foreign		
	IPO Mainland	IPO foreign	M&A	IPO Mainland	IPO foreign	M&A	IPO Mainland	IPO foreign	M&A
Column	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Panel A: The impact of PTs on the choices of exit routes									
PTs	1.088*** (0.000)	0.164 (0.569)	0.460* (0.063)	1.394*** (0.000)	-0.670 (0.327)	0.114 (0.705)	0.454 (0.291)	0.321 (0.184)	0.815** (0.020)
VC reputation	-0.154 (0.428)	0.512* (0.073)	-0.025 (0.917)	-0.331** (0.030)	1.263** (0.015)	-0.219 (0.523)	0.928 (0.268)	0.023 (0.948)	0.133 (0.671)
VC age	-0.068*** (0.008)	-0.047 (0.224)	-0.025 (0.349)	-0.061** (0.029)	0.004 (0.951)	-0.029 (0.456)	-0.039 (0.672)	-0.025 (0.572)	-0.038 (0.378)
Institutional VC indicator	-0.080 (0.875)	0.979** (0.035)	-0.447 (0.288)	-0.639 (0.193)	1.728*** (0.000)	-0.354 (0.487)	1.140** (0.042)	0.086 (0.837)	-0.507 (0.477)
Portfolio firm age	0.080*** (0.000)	0.067*** (0.000)	-0.079*** (0.001)	0.086*** (0.000)	0.005 (0.887)	-0.095*** (0.003)	0.114*** (0.003)	0.111*** (0.000)	-0.043 (0.219)
Syndicate size	0.363*** (0.000)	0.401*** (0.000)	0.106 (0.144)	0.470*** (0.000)	0.391*** (0.000)	0.129 (0.228)	-0.299 (0.185)	0.485*** (0.000)	0.109 (0.307)
Joint investment	-0.073** (0.023)	0.852*** (0.003)	-0.176 (0.549)	-1.181*** (0.001)	1.664*** (0.000)	-0.225 (0.630)	1.205* (0.054)	-0.147 (0.514)	-0.191 (0.648)
Domestic IPO condition	1.592*** (0.000)	-0.414* (0.071)	-1.054*** (0.000)	1.833*** (0.000)	-0.719** (0.025)	-1.223 (0.000)	0.171 (0.808)	-0.258 (0.405)	-0.966*** (0.000)
Domestic M&A condition	-2.099*** (0.000)	-1.708*** (0.000)	-2.054*** (0.000)	-2.298*** (0.000)	-1.075** (0.013)	-2.135*** (0.000)	-1.139 (0.113)	-2.165*** (0.000)	-0.038 (0.378)
Headquarters of VC firms	1.602*** (0.000)	-1.191*** (0.000)	-0.319 (0.179)						
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log Pseudolikelihood	-663.5	-397.7	-510.2	-541.2	-138.6	-270.8	-91.148	-223.6	-229.2
Pseudo R2	0.323	0.302	0.218	0.298	0.394	0.258	0.218	0.297	0.198
Obs.	2578	2578	2578	1582	1582	1582	996	996	996

Appendix A.5 (continued)

Sample Exit routes	Total			Domestic			Foreign		
	IPO Mainland	IPO foreign	M&A	IPO Mainland	IPO foreign	M&A	IPO Mainland	IPO foreign	M&A
Column	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Panel B: The impact of different types of PTs on exit routes									
Central ownership PTs	1.187*** (0.005)	-0.918 (0.117)	0.158 (0.710)	1.616*** (0.001)	-1.828*** (0.010)	-0.082 (0.867)			
Local ownership PTs	0.877*** (0.003)	-0.110 (0.830)	0.175 (0.595)	1.154*** (0.001)	-0.623 (0.446)	0.084 (0.816)			
Central management PTs	1.219*** (0.000)	0.322 (0.263)	0.541** (0.026)	1.663*** (0.000)	-0.359 (0.600)	-0.076 (0.859)	0.212 (0.605)	0.258 (0.594)	0.990*** (0.010)
Local management PTs	1.051*** (0.000)	-0.507 (0.474)	0.487 (0.178)	1.305*** (0.001)	-1.417 (0.239)	0.448 (0.211)	1.372*** (0.001)	0.689 (0.256)	0.642 (0.108)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald test for HO (p-value):									
Management PTs-Ownership PTs=0	0.213	0.469	0.091*	0.166	0.599	0.703	0.292	0.161	0.018**
Local PTs-Central PTs=0	0.370	0.001***	0.609	0.106	0.185	0.269	0.579	0.533	0.383

Appendix A.6: Alternative measure of VC exits

This table presents the logit models with an alternative measure for VC exits. This new measure is a dummy taking a value of 1 if the portfolio firm went public, or was acquired between 1st January 2004 and 31st December 2014, or received follow-up VC investments during the period from January 2011 to December 2014. Other variable definitions are presented in Appendix A.1. Intercepts and control variables are not reported. Brackets contain robust p-values clustered by lead VC firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

	All		Domestic		Foreign	
	[1]	[2]	[3]	[4]	[5]	[6]
PTs	0.681*** (0.000)		0.756*** (0.000)		0.652*** (0.000)	
Central ownership PTs		0.420 (0.182)		0.503 (0.149)		
Local government PTs		0.481** (0.016)		0.587** (0.023)		
Central management PTs		0.870*** (0.000)		0.984*** (0.002)		0.976** (0.012)
Local management PTs		0.599*** (0.001)		0.721*** (0.009)		0.383* (0.097)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Log Pseudolikelihood	-1265.3	-1262.4	-773.2	-770.9	-465.7	-464.4
Pseudo R2	0.234	0.235	0.254	0.256	0.996	0.996
Obs.	2578	2578	1582	1582	0.237	0.239

Appendix A.7: The effect of PTs on VC exits across well developed and less developed regions

This table uses logit models to examine the effect of PTs on the likelihood of successful exits across different regions. The dependent variable for all models is *VC exits*, which takes a value of one if the portfolio firm went public or was acquired during the period from 2004 to 2014. Other variable definitions are presented in Appendix A.1. Intercepts are not reported. Brackets contain robust p-values clustered by lead VC firms. ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respectively.

Variable Region	Total		Domestic		Foreign	
	Big 3 cities	Other cities	Big 3 cities	Other cities	Big 3 cities	Other cities
	[1]	[2]	[3]	[4]	[5]	[6]
PTs	1.005*** (0.000)	0.788*** (0.001)	1.443*** (0.000)	0.541** (0.045)	0.673** (0.036)	1.332*** (0.000)
Rep. VC	0.426*** (0.008)	-0.192 (0.538)	0.231 (0.326)	-0.496 (0.103)	0.279 (0.307)	0.506 (0.301)
VC age	-0.092*** (0.001)	-0.022 (0.467)	-0.148*** (0.000)	-0.028 (0.391)	-0.059* (0.072)	-0.063 (0.374)
Institutional VC indicator	0.209 (0.439)	0.522 (0.134)	-0.015 (0.955)	0.997** (0.035)	0.581 (0.272)	0.006 (0.992)
Portfolio firm age	0.082*** (0.000)	0.034* (0.092)	0.080*** (0.002)	0.037 (0.134)	0.097*** (0.000)	0.042 (0.207)
Syndicate size	0.472*** (0.000)	0.642*** (0.000)	0.582*** (0.000)	0.717*** (0.000)	0.421*** (0.000)	0.406*** (0.010)
Joint investment	-0.011 (0.958)	-0.575** (0.030)	0.212 (0.506)	-0.728*** (0.009)	-0.087 (0.807)	0.021 (0.971)
Domestic IPO condition	-0.847*** (0.000)	-0.094 (0.802)	-0.547** (0.037)	-0.102 (0.794)	-1.207*** (0.000)	-0.192 (0.812)
Domestic M&A condition	-3.604*** (0.000)	-4.161*** (0.000)	-4.566*** (0.000)	-3.857*** (0.000)	-3.126*** (0.000)	-5.026*** (0.001)
Headquarters	0.014 (0.946)	0.057 (0.854)				
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Log Pseudolikelihood	-500.8	-516.321	-238.5	-404.9	-241.1	-99.9
Pseudo R2	0.294	0.303	0.347	0.298	0.288	0.389
Observation	1361	1217	648	934	713	283

APPENDIX B

FOR ESSAY TWO

Appendix B.1: Definitions of variables

Variables	Definitions
DAC ₀	Discretionary accruals are computed by either (i) the modified Jones (1991) model, (ii) or Kothari et al. (2005) performance matched model at fiscal year 0.
DAC ₋₁	Discretionary accruals are computed by the modified Jones (1991) model at fiscal year-1.
DAC ₁	Discretionary accruals are computed by the modified Jones (1991) model at fiscal year 1.
VC dummy	1= VC-backed IPOs, 0= otherwise.
PTs	1= If the lead VC firm is controlled by the government, and/or its management team has social network ties with the government (e.g., having at least one former government official, former/current member of the People's Congress, or former/current member of the People's Political Consultative Conference), 0= otherwise.
Ownership PTs	1= If the lead VC is controlled by the government, and zero otherwise.
Management PTs	1= If the lead VC's management team have social network ties with the government (e.g., having at least one former government official, former/current member of the People's Congress, or former/current member of the People's Political Consultative Conference), 0= otherwise.
Lock-up sale	1=If a lead VC sells any proportion of its shareholdings within six months after the lock-up expiration, 0= otherwise.
IPO age	The logarithm of issuer age which is measured as the number of years between the establishment date of the IPO firm and the IPO date.
Log(Gross proceeds)	The logarithm of gross proceeds which is measured as the product of offer price and the number of shares issuing.
Leverage	Total debt to total assets ratio one year before IPO.
ROA	Net income to total assets one year before IPO.
Initial returns	The percentage difference between aftermarket price and offer price of an IPO.
Growth in sales	The percentage change in sales from pre-IPO year to IPO year.
Auditor reputation	1= If the IPO firm hires the audit service of a top 6 auditor in China, 0=otherwise.
Underwriter reputation	1= if the lead underwriter is among the top 25% in Chinese markets, based on their cumulative market share one year before IPO, 0= otherwise.
Largest shareholding	The percentage of shares held by the largest shareholder.
CEO ownership	The percentage of shares held directly and indirectly by the CEO of an issuing firm.
VC on board	1= if there is a venture capitalist on board, 0=otherwise.
VC duration	The number of years a VC firm has invested in its backed firm.
Syndicate size	The number of VC syndicate members invested in an IPO issuer.
VC age	The logarithm of one plus VC age, which is measured as the number of years between the establishment date of a VC firm and the IPO date of its backed firm.
Rep. VC (Krishnan et al., 2011)	1= If a lead VC's prior market share of VC-backed IPOs in the past three years ranks in the top 25% in the VC market the year prior to an IPO, and 0 otherwise.
Rep. VC (Zero2IPO Research)	1= If the lead VC is among the top 10 according to the Zero2IPO Research (http://www.zero2ipo.com.cn/en/research/), 0= otherwise.
VC ownership before/after the IPO	The percentage of shares held by the lead VC before/after the IPO.
Listing Board	1= IPOs listed on the Venture Board, 0= otherwise.
CAR1Y	One-year cumulative abnormal returns after listing.
CAR2Y	Two-year cumulative abnormal returns after listing.

Appendix B.2: Sample distribution

The sample includes 924 IPOs listed on the SME and Venture Boards from 2004 to 2012. Panel A shows the frequency distribution of IPOs by listing year. Panel B presents the industry distribution of our sample firms, whereas Panel C presents the region distribution. All variables are defined in Appendix B.1. The differences in means are based on the independent t-tests.

Panel A: Distribution by IPO listing year

Listing year	Full sample		VC	Non-VC	PTs	Without PTs	Ownership PTs	Management PTs
	Freq.	%	Freq.	Freq.	Freq.	Freq.	Freq.	Freq.
	[1]	[2]	[3]	[4]	[5]=[7]+[8]	[6]	[7]	[8]
2004	29	3.1	6	23	5	1	5	0
2005	8	0.9	2	6	2	0	1	1
2006	31	3.4	9	22	4	5	4	0
2007	73	7.9	20	53	17	3	11	6
2008	58	6.3	18	40	14	4	5	9
2009	80	8.8	40	36	29	11	13	16
2010	291	31.5	125	166	84	41	42	42
2011	233	25.2	111	122	70	41	27	43
2012	121	13.1	68	53	44	24	10	34
Total	924	100	399	525	269	130	118	151

Panel B: Distribution by industry

Industry	Full sample		VC	Non-VC	PTs	Without PTs	Ownership PTs	Management PTs
	Freq.	%	Freq.	Freq.	Freq.	Freq.	Freq.	Freq.
	[1]	[2]	[3]	[4]	[5]=[7]+[8]	[6]	[7]	[8]
Agriculture, fishing and stock raising	17	2	7	10	4	3	3	1
Mining	10	1	5	5	5	0	1	4
Manufacturing	686	74	287	399	188	99	89	99
Utilities	2	0	0	2	0	0	0	0
Construction	18	2	7	11	7	0	2	5
Transportation and Warehousing	7	1	3	4	1	2	1	0
IT	125	14	64	61	47	17	19	28
Wholesale and retail	17	2	6	11	4	2	0	4
Real state	5	1	1	4	1	0	0	1
Social service	25	3	14	11	9	5	3	6
Media	11	1	5	6	3	2	0	3
Conglomerates	1	0	0	1	0	0	0	0
Total	924	100	399	525	269	130	118	151

Appendix B.2 (Continued)

Panel C: Distribution by region

Province	Full sample		VC	Non-VC	PTs	Without PTs	Ownership PTs	Management PTs
	Freq.	%	Freq.	Freq.	Freq.	Freq.	Freq.	Freq.
	[1]	[2]	[3]	[4]	[5]=[7]+[8]	[6]	[7]	[8]
East	713	77.2	302	411	207	95	97	110
Beijing	78	8.4	43	35	36	7	10	26
Shanghai	51	5.5	21	30	12	9	6	6
Guangdong	203	22.0	94	109	66	28	33	33
Jiangsu	125	13.5	56	69	42	14	28	14
Zhejiang	144	15.6	46	98	29	17	9	20
Shandong	68	7.4	24	44	12	12	9	3
Fujian	37	4.0	14	23	7	7	1	6
Tianjin	7	0.8	4	3	3	1	1	2
Central	147	15.9	72	75	47	25	16	31
West	39	4.2	14	25	11	3	4	7
Northeast	25	2.7	11	14	4	7	1	3
<i>Total</i>	924	100.0	399	525	269	130	118	151

Note: Central includes Anhui, Hunan, Sichuan, Hubei, Jiangxi, Hunan, Hebei, Chongqing, Shanxi. West includes Inner Mongolia, Hainan, Guangxi, Guizhou, Yunnan, Shan'Xi, Gansu, Qinghai, Ningxia, Xinjiang, Tibet. Northwest includes Liaoning, Jilin, Heilongji

Appendix B.3: Univariate analysis

This table presents the univariate tests of DAC_0 between IPOs backed by VCs with management PTs and other IPO subsamples. Variable definitions are included in Appendix B.1. The differences in means and medians are based on the independent t-tests and Wilcoxon tests, respectively. *, **, *** represent statistical significance at the 10%, 5%, and 1% level respectively.

<i>Panel A: Modified Jones DAC_0</i>				
	Mean	Diff	Median	Diff
Management PTs	0.042		0.029	
Ownership PTs	0.141	0.099***	0.105	0.076***
VCs without PTs	0.116	0.074***	0.096	0.067***
Non-VC backed IPOs	0.084	0.042***	0.062	0.033***
<i>Panel B: Performance matched DAC_0</i>				
Management PTs	0.046		0.040	
Ownership PTs	0.161	0.115***	0.150	0.110***
VCs without PTs	0.115	0.069***	0.108	0.068**
Non-VC backed IPOs	0.085	0.039*	0.068	0.028

Appendix B.4: Pearson correlations

This table presents the Pearson correlations among variables included in essay two. All variables are defined in Appendix B.1. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	A	B	C	D	E	F	G	H	I	J	K	L	M
(A) DAC ₀	1	-0.013	0.127***	-0.131***	0.079**	-0.052	0.139***	-0.069**	0.091***	-0.013	0.007	0.033	-0.011
(B) PTs		1	0.597***	0.689***	0.455***	0.018	0.029	-0.001	-0.091***	0.008	0.046	-0.015	0.134***
(C) Ownership PTs			1	-0.169***	0.245***	0.015	-0.007	0.004	0.012	-0.016	-0.026	-0.058	0.044
(D) Management PTs				1	0.338***	0.008	0.042	-0.005	-0.123***	0.024	0.079**	0.033	0.124***
(E) Lock-up sale					1	-0.034	0.031	-0.018	-0.011	-0.026	0.032	-0.022	0.071**
(F) IPO age						1	0.021	-0.086***	0.028	-0.045	0.009	-0.059*	-0.057*
(G) Gross Proceeds							1	-0.095***	0.015	0.082**	0.127***	0.294***	-0.035
(H) Growth in sales								1	-0.128***	-0.042	0.006	0.168***	0.194***
(I) Leverage									1	-0.029	-0.103***	-0.022	-0.356***
(J) Auditor reputation										1	-0.004	-0.046	0.072**
(K) Underwriter underputation											1	0.041	0.078**
(L) Largest shareholding												1	0.049
(M) Listing Board													1

Appendix B.5: Re-run Table 3.3 with a subsample of VC with 12 months lock-up period

This table presents the OLS estimates for IPOs occurring during 2004-2012, excluding VC-backed IPOs with 36 months lock-up period. The dependent variable for Panel A is the IPO-year DAC estimated from the modified Jones model, and for Panel B is the IPO-year DAC estimated from the Kothari et al. (2005)'s performance matched abnormal accruals model. Other variable definitions are included in Appendix B.1. All regressions include year, industry, region and listing board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, *** represent statistical significance at the 10%, 5%, and 1% level respectively.

Panel A: Modified Jones Model									
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
VC dummy	0.007 (0.506)					-0.010			
Ownership PTs		0.053*** (0.000)					0.019 (0.306)		
Management PTs			-0.056*** (0.000)					-0.070*** (0.000)	
VC without PTs				0.029* (0.074)					0.010 (0.639)
Lock-up sale					0.022 (0.116)				
Lock-up sale*VC subsample						0.030* (0.066)	0.060* (0.057)	0.021 (0.360)	0.036 (0.227)
IPO age	-0.022* (0.080)	-0.020 (0.111)	-0.021* (0.098)	-0.022* (0.079)	-0.021* (0.095)	-0.021* (0.085)	-0.019 (0.133)	-0.020* (0.099)	-0.022* (0.076)
Ln(Gross proceeds)	0.045*** (0.000)	0.046*** (0.000)	0.048*** (0.006)	0.045*** (0.000)	0.044*** (0.000)	0.045*** (0.000)	0.045*** (0.000)	0.047*** (0.000)	0.046*** (0.000)
Growth in sales	-0.007 (0.340)	-0.007 (0.337)	-0.007 (0.329)	-0.006 (0.390)	-0.007 (0.322)	-0.007 (0.325)	-0.007 (0.352)	-0.007 (0.315)	-0.006 (0.392)
Leverage	0.101*** (0.006)	0.098*** (0.007)	0.094** (0.010)	0.096*** (0.009)	0.099*** (0.007)	0.010*** (0.007)	0.096*** (0.009)	0.093*** (0.010)	0.097*** (0.009)
Auditor reputation	-0.016 (0.199)	-0.014 (0.243)	-0.014 (0.242)	-0.016 (0.498)	-0.014 (0.259)	-0.014 (0.246)	-0.013 (0.289)	-0.013 (0.254)	-0.015 (0.208)
Underwriter reputation	-0.007 (0.530)	-0.005 (0.646)	-0.004 (0.696)	-0.007 (0.511)	-0.000 (0.963)	-0.007 (0.518)	-0.005 (0.650)	-0.004 (0.705)	-0.008 (0.487)
Largest shareholding	0.008 (0.699)	0.011 (0.596)	0.007 (0.728)	0.009 (0.661)	0.008 (0.696)	0.008 (0.714)	0.011 (0.578)	0.007 (0.743)	0.009 (0.659)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.051	0.062	0.066	0.055	0.055	0.055	0.067	0.067	0.056
Obs.	837	837	837	837	837	837	837	837	837

Appendix B.5 (Continued)

Panel B: Performance matched model									
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
VC dummy	0.025* (0.095)					0.011 (0.595)			
Ownership PTs		0.071*** (0.001)					0.033 (0.227)		
Management PTs			-0.042** (0.030)					-0.034 (0.271)	
VC without PTs				0.025 (0.314)					0.007 (0.830)
Lock-up sale					0.033* (0.060)				
Lock-up sale*VC subsample						0.025 (0.292)	0.065* (0.084)	-0.011 (0.771)	0.033 (0.472)
IPO age	-0.022 (0.246)	-0.018 (0.317)	-0.023 (0.226)	-0.023 (0.220)	-0.021 (0.263)	-0.021 (0.257)	-0.017 (0.361)	-0.022 (0.229)	-0.023 (0.222)
Ln(Gross proceeds)	0.046*** (0.003)	0.045*** (0.003)	0.046*** (0.003)	0.046*** (0.003)	0.047*** (0.002)	0.046*** (0.003)	0.044*** (0.004)	0.046*** (0.002)	0.047*** (0.003)
Growth in sales	0.002 (0.798)	0.002 (0.837)	0.002 (0.814)	0.003 (0.785)	0.002 (0.824)	0.002 (0.811)	0.002 (0.831)	0.002 (0.807)	0.003 (0.781)
Leverage	0.098* (0.064)	0.093* (0.077)	0.093* (0.082)	0.096* (0.071)	0.097* (0.069)	0.098* (0.063)	0.090* (0.085)	0.093* (0.082)	0.098* (0.068)
Auditor reputation	-0.024 (0.151)	-0.023 (0.165)	-0.025 (0.131)	-0.024 (0.138)	-0.023 (0.169)	-0.023 (0.159)	-0.022 (0.188)	-0.025 (0.129)	-0.025 (0.134)
Underwriter reputation	0.002 (0.917)	0.005 (0.766)	0.004 (0.819)	0.002 (0.913)	-0.003 (0.864)	0.001 (0.938)	0.004 (0.775)	0.004 (0.823)	0.001 (0.942)
Largest shareholding	0.026 (0.247)	0.027 (0.213)	0.022 (0.319)	0.024 (0.285)	0.024 (0.276)	0.025 (0.267)	0.028 (0.204)	0.023 (0.311)	0.024 (0.290)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.090	0.099	0.091	0.088	0.092	0.091	0.103	0.091	0.089
Obs.	672	672	672	672	672	672	672	672	672

Appendix B.6: Re-run Table 3.4 with a subsample of VC with 12 months lock-up period

This table presents the second stage of a two-step regression process for IPOs occurring during 2004-2012, excluding VC-backed IPOs with 36 months lock-up period. The dependent variable for Panel A is the IPO-year DAC estimated from the modified Jones model, and for Panel B is the IPO-year DAC estimated from the Kothari et al. (2005)'s performance matched abnormal accruals model. Other variable definitions are included in Appendix B.1. All regressions include year, industry, region and listing board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, *** represent statistical significance at the 10%, 5%, and 1% level respectively.

	Modified Jones				Performance matched			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Ownership PTs	0.053* (0.070)	0.034 (0.650)			0.032** (0.049)	0.029* (0.092)		
Management PTs			-0.106*** (0.008)	-0.190*** (0.000)			-0.024** (0.048)	-0.013 (0.136)
Lock-up sale*VC subsample		0.061** (0.049)		0.034 (0.157)		0.061** (0.042)		0.003 (0.934)
IPO age	-0.012 (0.365)	-0.011 (0.443)	-0.019 (0.120)	-0.030** (0.047)	-0.002 (0.902)	-0.001 (0.974)	-0.030 (0.150)	-0.026 (0.207)
Ln(Gross proceeds)	0.040*** (0.001)	0.039*** (0.001)	0.049*** (0.000)	0.037*** (0.003)	0.039** (0.013)	0.038** (0.016)	0.046*** (0.005)	0.052*** (0.002)
Growth in sales	-0.006 (0.412)	-0.006 (0.435)	-0.007 (0.332)	-0.008 (0.320)	0.002 (0.846)	0.002 (0.840)	0.003 (0.800)	0.000 (0.978)
Leverage	0.075** (0.048)	0.071* (0.063)	0.087** (0.017)	0.124*** (0.002)	0.068 (0.223)	0.064 (0.246)	0.143** (0.011)	0.139** (0.013)
Auditor reputation	-0.010 (0.428)	-0.009 (0.503)	-0.013 (0.288)	-0.021 (0.147)	-0.016 (0.384)	-0.014 (0.423)	-0.025 (0.189)	-0.026 (0.166)
Underwriter reputation	0.001 (0.961)	0.001 (0.931)	-0.002 (0.846)	-0.016 (0.202)	0.015 (0.361)	0.015 (0.360)	-0.012 (0.488)	-0.009 (0.597)
Largest ownership	0.022 (0.287)	0.024 (0.262)	0.007 (0.718)	0.004 (0.849)	0.047** (0.038)	0.048** (0.034)	0.021 (0.389)	0.021 (0.391)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	837	837	837	837	672	672	672	672

Appendix B.7: Re-run Table 3.5 with a subsample of VC with 12 months lock-up period

This table presents treatment adjusted DAC based on IPOs occurring during 2004-2012, excluding VC-backed IPOs with 36 months lock-up period. PO-year EM is measured as abnormal accruals estimated from either (i) a modified Jones model, or (ii) a Kothari et al. (2005)'s performance matched abnormal accruals model at fiscal year 0. Other variable definitions are included in Appendix B.1. Three PSM techniques are used - nearest neighbourhood matching, Gaussian Kernel matching, and the stratification method. The endogenous choice of different types of VC financing is adjusted by using the control variables as instrumental variables in the first stage. Based on the parameters estimated in the first-stage probit regression, we then estimate the probability of different types of VC financing (treatments) and use this probability to match each treated firms to their non-treated counterparties with the closest probability measure. T-values are shown in brackets. *, **, ***represent statistical significance at the 10%, 5%, and 1% level, respectively. Matching is conducted with replacement and bootstrapped standard errors are used for statistical inference. The bootstrapped standard errors are based on 50 replications. Variable definitions are included in Appendix B.1.

		Obs.	Nearest Neighbor	Gaussian	Stratification
<i>Modified Jones</i>					
Ownership PTs	Sale	52	0.077** (2.253)	0.081** (2.620)	0.084*** (2.763)
	Not sale	40	0.016 (0.500)	0.010 (0.521)	0.013 (0.726)
Management PTs	Sale	76	-0.033 (-1.425)	-0.041** (-2.837)	-0.041** (-2.470)
	Not sale	43	-0.087*** (-2.867)	-0.067*** (-3.410)	-0.069*** (-4.555)
VCs without PTs	Sale	58	0.052* (1.688)	0.046** (2.121)	0.043 (1.654)
	Not sale	51	0.002 (0.078)	0.014 (0.711)	0.006 (0.261)
<i>Performance Matched</i>					
Ownership PTs	Sale	47	0.084** (1.909)	0.096*** (3.337)	0.102*** (3.623)
	Not	34	0.025 (0.613)	0.024 (0.798)	0.029 (1.271)
Management PTs	Sale	51	-0.052 (-1.457)	-0.047** (-1.907)	-0.048** (-1.972)
	Not	30	-0.021 (-0.523)	-0.035 (-1.295)	-0.042 (-1.420)
VCs without PTs	Sale	44	0.026 (0.569)	0.036 (1.127)	0.033 (0.962)
	Not	39	-0.055 (-1.253)	0.011 (0.320)	0.007 (0.221)

Appendix B.8: Re-run Table 3.6 with a subsample of VC with 12 months lock-up period

This table presents treatment adjusted cumulative abnormal returns (CARs) based on IPOs occurring during 2004-2012, excluding VC-backed IPOs with 36 months lock-up period. We adjust for the endogenous choice of different types of VC financing by using the control variables as instrumental variables in the first stage. Based on the parameters estimates in the first-stage probit regression, we estimate the probability of different type of VC financing (treatments) and use this probability to match each treated firms to their non-treated counterparties with closest probability measure. T-values are shown in brackets. *, **, ***represent statistical significance at the 10%, 5%, and 1% level, respectively. Matching is conducted with replacement and bootstrapped standard errors are used for statistical inference. The bootstrapped standard errors are based on 100 replications. Variable definitions are included in Appendix B.1.

		Obs.	Nearest Neighbor	Gaussian	Stratification
CAR1Y					
Ownership PTs	Sale	52	-0.070 (-1.060)	-0.063 (-1.346)	-0.046 (-0.887)
	Not sale	40	-0.131 (-1.638)	-0.076 (-1.093)	-0.067 (-1.366)
Management PTs	Sale	76	-0.057 (-0.988)	0.04 (0.907)	0.018 (0.450)
	Not sale	43	-0.128 (-1.534)	-0.048 (-0.728)	-0.079 (-1.246)
VCs without PTs	Sale	58	-0.098* (-1.695)	-0.107** (-2.354)	-0.100** (-2.009)
	Not sale	51	-0.049 (-0.604)	-0.009 (-0.205)	0.007 (0.158)
CAR2Y					
Ownership PTs	Sale	52	-0.131 (-1.294)	-0.133** (-2.111)	-0.109 (-1.514)
	Not sale	40	-0.104 (-0.958)	-0.068 (-0.841)	-0.060 (-0.768)
Management PTs	Sale	76	-0.057 (-0.694)	0.081 (0.127)	0.049 (0.791)
	Not sale	43	0.273** (2.456)	0.105 (1.540)	0.036 (0.482)
VCs without PTs	Sale	58	-0.124 (-1.244)	-0.056 (-0.877)	-0.051 (-0.803)
	Not sale	51	-0.1 (-0.879)	0.017 (0.198)	0.039 (0.461)

Appendix B.9: Significant VC ownership and EM

This table presents how significant VC ownership (VCSIG) influences the effects of VCs with PTs on EM. The dependent variable is DAC_0 estimated from either (i) a modified Jones model, or (ii) a Kothari et al. (2005)'s performance matched abnormal accruals model. VCSIG is a dummy which equals 1 if lead VC ownership in an IPO is more than 5%, and 0 otherwise. *VC subsample* stands for *ownership PTs* in columns 2 and 6, and *management PTs* in columns 4 and 8. Other variable definitions are included in Appendix B.1. All regressions include year, industry, region and listing board fixed effects. Intercepts are not reported. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, *** represent statistical significance at the 10%, 5%, and 1% level respectively.

	Modified Jones				Performance matched			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Ownership PTs*VCSIG	0.061*** (0.001)	0.032 (0.151)			0.074*** (0.001)	0.042 (0.136)		
Management PTs*VCSIG			-0.069*** (0.000)	-0.078*** (0.000)			-0.069*** (0.001)	-0.076** (0.018)
Lock-up sale*VC subsample*VCSIG		0.064* (0.065)		0.016 (0.052)		0.073* (0.065)		0.013 (0.725)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.057	0.062	0.064	0.064	0.082	0.086	0.079	0.079
Obs.	924	924	924	924	741	741	741	741

Appendix B.10: VC characteristics and EM-VC subsample

This table presents ordinary least squares (OLS) estimates for VC-backed IPOs. The dependent variable is DAC_0 defined as abnormal accrual estimated from either (i) a modified Jones model, or (ii) a Kothari et al. (2005)'s performance matched abnormal accruals model at fiscal year 0. *VC subsample* stands for *ownership PTs* for columns 2 and 6, and *management PTs* for columns 4 and 8. Other variable definitions are presented in Appendix B.1. All regressions include year, industry, region and listing board fixed effects. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. *, **, *** represent statistical significance at the 10%, 5%, and 1% level respectively.

	Modified Jones				Performance matched			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Ownership PTs	0.073*** (0.000)	0.041* (0.063)			0.080*** (0.002)	0.048* (0.082)		
Management PTs			-0.092*** (0.000)	-0.098*** (0.000)			-0.082*** (0.001)	-0.090*** (0.003)
Lock-up sale* VC subsample		0.073** (0.032)		0.015 (0.501)		0.075* (0.059)		0.017 (0.628)
Rep. VC	-0.003 (0.916)	-0.007 (0.789)	0.009 (0.721)	0.009 (0.725)	0.007 (0.816)	0.002 (0.953)	0.021 (0.514)	0.021 (0.515)
VC syndicate size	0.001 (0.892)	-0.000 (0.993)	0.004 (0.564)	0.004 (0.725)	0.004 (0.730)	0.002 (0.830)	0.006 (0.502)	0.007 (0.517)
VC on board	-0.009 (0.711)	-0.009 (0.688)	0.005 (0.836)	0.003 (0.881)	0.015 (0.632)	0.011 (0.721)	0.027 (0.372)	0.023 (0.455)
VC age	0.001 (0.471)	0.001 (0.496)	0.002 (0.173)	0.002 (0.190)	-0.001 (0.948)	-0.000 (0.920)	0.001 (0.666)	0.001 (0.757)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Board fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.101	0.144	0.132	0.131	0.142	0.146	0.154	0.139
Obs.	399	399	399	399	307	307	307	307

APPENDIX C

FOR ESSAY THREE

Appendix C.1: Definitions of variables

Variables	Definitions
Board composition	
Board size	Number of directors on the board.
# Exec	Number of executives in an IPO firm.
# Exec on board	Number of executives on the board of an IPO firm.
% Exec on board	Percentage of the board that are executive directors.
% Quasi outsiders	Percentage of non-executive directors that are past or current employees, are related (by family) to controlling shareholders and management directors, or have business dealings with the firm.
% Non-indep directors	Percentage of the board that are executive directors and quasi outsiders.
% Indep	Percentage of the board that are independent (outside) directors. It is the sum of % <i>Indep prospectus</i> and % <i>Monitoring/Advising directors</i> . It also equals one minus % <i>non-indep directors</i> .
% <i>Indep prospectus</i>	Percentage of the board that are independent directors as described in IPO prospectuses
% <i>Monitoring/Advising directors</i>	Percentage of the board that are not described as independent directors in the IPO prospectuses, have no business dealings with the IPO, are not related to controlling shareholders and management directors, and are/were not employees of the firm.
% <i>Indep indus exp</i>	Percentage of the board that are independent directors and have industry relevant expertise. For example, if the IPO is a bio-tech firm, the independent director is defined as having industry relevant expertise if he/she has had previously/currently worked in the same industry, or has a science degree.
% <i>Other indep</i>	Percentage of the board that are independent directors and are not venture capitalists and have no industry relevant expertise.
VC on board	The number of IPO firms that have venture capitalists on board.
% VCs on board	Percentage of the board that are venture capitalists.
VC characteristics	
VC dummy	1= VC-backed IPOs, 0= otherwise.
PTs	1= If the lead VC firm is controlled by the government, and/or management team has social network ties with the government (e.g., having at least one former government official, former/current member of the People's Congress, or former/current member of the People's Political Consultative Conference, 0= otherwise.
Ownership PTs	1= If the lead VC is controlled by the government, 0= otherwise.
Management PTs	1= If the lead VC's management team have social network ties with the government (e.g., having at least one former government official, former/current member of the People's Congress, or former/current member of the People's Political Consultative Conference), 0= otherwise.
CEO characteristics	
Age	Age of the CEO
Tenure	The length of time served as CEO or director of the board.
Founder	1=if the CEO is the founder or a family member of the founder, 0=otherwise.
Dual	1=if the CEO is the Chairman of the Board or a family member of the Chairman, 0= otherwise.
Firm Characteristics	
Total assets	Pre-IPO total assets.
R&D intensity	The ratio of R&D expenses to operating revenue before IPO.
ROA	Net income to total assets one year before IPO.
Age	Issuer age which is measured as the number of years between the establishment date of the IPO firm and the IPO date.
Ownership	
Largest shareholding	Percentage of shares held by the largest shareholder.
CEO ownership	Percentage of shares held directly and indirectly by the CEO.
BOD ownership	Percentage of shares held directly and indirectly by directors.
Exec ownership	Percentage of shares held directly and indirectly by executives.
Indep ownership	Percentage of shares held by independent directors excluding venture capitalists.
Outsiderown	1=if <i>indep ownership</i> is above zero, 0=otherwise.
Instrumental variables	
GIID	The governmental intervention development index developed by Fan et al. (2009). A lower (higher) GIID indicates more (less) government intervention.
JZ	1=the portfolio firm locates in Jiangsu and Zhejiang, 0=otherwise.
Post-IPO performance	
CAR2Y	Two-year cumulative abnormal returns after listing

Appendix C.2: Pearson correlations

This table presents the Pearson correlations among variables used for essay three. All variables are defined in Appendix C.1. ***, **, and * denote statistical significance at the 1%, 5%, and 10% respectively.

	A	B	C	D	E	F	G	H	I	J	K	L	M
A.VC dummy	1	0.735***	0.439***	0.507***	-0.030	0.039	0.014	0.107	-0.017	0.117***	-0.007	-0.158***	-0.029
B.PTs		1	0.597***	0.689***	-0.065**	0.033	0.026	-0.066**	0.018	0.111***	-0.004	-0.146	-0.001
C.Ownership PTs			1	-0.169***	-0.039	0.007	-0.038	-0.052	0.015	0.047	-0.058*	-0.118***	0.011
D.Management PTs				1	-0.045	0.035	0.066**	-0.035	0.008	0.093**	0.047	-0.073**	-0.011
E. CEO age					1	0.131***	-0.052	-0.006	0.155***	-0.030	-0.044	0.005	-0.010
F. Tenure						1	0.213***	0.024	0.727***	-0.007	-0.007	-0.045	0.012
G. Founder							1	-0.059*	-0.028	0.036	0.122***	0.025	0.033
H. Total assets								1	0.008	-0.016	-0.030	0.031	0.025
I. IPO age									1	-0.051	-0.094***	0.082**	-0.000
J. R&D intensity										1	0.365***	0.007	-0.007
K. ROA											1	-0.174	-0.029
L. Largest shareholding												1	-0.201
M. Ownershipown													1