VC political connections and IPO earnings management☆

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ABSTRACT

We examine the effect of VC political connections on accrual and real earnings management (EM) of IPOs controlled by private entrepreneurs in China. We find IPOs backed by government-controlled VCs exhibit severe IPO-year EM, which is driven by those VCs exiting their investments immediately after the VC lock-up expiration. In contrast, IPOs with politically connected private VCs have lower IPO-year EM and are not associated with VC exits. Therefore, IPOs with government-controlled VCs who immediately exit their investments are most likely to engage in 'window-dressing' of financial performance, and to have poorer long-run stock performance. The results remain unchanged after a battery of robustness tests.

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1. Introduction

We examine the external monitoring effects of venture capitalists (VCs) on IPO firms' accrual and real earnings management (EM) in the largest transitional and emerging market, China. The results show government-controlled VCs are most associated with IPO firms who 'window-dress' accrual and real earnings, have poorer long-run stock performance and most likely to exit immediately after VC share lock-up expiration. In contrast, privately owned VCs with management-level political connections are associated with IPOs exhibiting the lowest level of EM.

Prior research shows companies manage their earnings to improve short-term performance around IPOs (Teoh et al., 1998a, 1998b). However, recent developed market studies reveal managers' discretion is affected by the presence of VC investors (Cummings 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, political connections facilitate political rent seeking and access to valuable resources (e.g., Liu et al., 2013; Li and Zhou, 2015). Further, politically connected VCs enjoy greater number of successful exits than their non-connected counterparties (Cao et al., 2013; Anderson et al., 2017). Consequently, we examine whether politically connected VCs constrain IPO-year EM, or whether these VCs simply obtain their 'more reputable' status through their connections facilitating successful exits rather than providing monitoring roles in a transitional market.

VCs in China are typically either government controlled and therefore have ownership-level political connections, or alternatively have management-level political connections through their executives (Liu et al., 2013). Although government controlled VCs have better access to private information and resources, significant government ownership may lead to inefficiency and po-

litically motivated decisions (Okhmatovskiy, 2010; Cao et al., 2013). In addition, their uncompetitive compensation packages make it difficult to attract and retain top managers[1] (Chen et al., 2013a; PE Daily, 2013). On the other hand, private politically connected VCs obtain benefits of political ties while maintaining greater autonomy of selecting and advising companies. Top managers or general partners[2] of privately owned VCs are often founders or shareholders and as such more likely to be concerned with the long-term success of their VC firms. For these reasons, VCs with different types of political connections (ownership- versus management-level connections) face different incentives with respect to monitoring EM decisions of IPO issuers. The booming 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 political connections in constraining IPO-year EM in a sample of 885 entrepreneurial firms listed on the small and median enterprises (SME) and Venture Board (also called ChiNext market) during 2006–2012. We find IPOs backed by government owned VCs exhibit greater income-increasing real and accrual based EM during the IPO-year and this is driven by those firms whose VC backers exit their shareholding within six months of the share lock-up expiration. In contrast, IPOs backed by private VCs with management-level political connections exhibit less opportunistic EM and are not significantly associated with VC exits. Further, government VC-backed IPOs, especially those subject to VC exits, exhibit poorer long-run performance; whereas IPOs backed by political connected private VCs exhibit better post-issue stock performance. These results are robust to different EM measures (accrual-based and real EM proxies) and the endogenous choice of VC backing (Heckman selection and propensity score matching approaches).

This study contributes to the existing literature in the following ways. First, to our knowledge, this is the first study to examine the role of VCs in affecting EM decisions of IPO issuers in an emerging and transitional economy. In addition, we investigate both real and accrual based EM. Second, we extend the political connection literature by examining the role of direct government ownership and political connections of private VC firms in influencing IPO management decisions. Third, we provide evidence regarding the effect of VC exits on IPO-year EM and IPO long-run performance in an emerging market. In summary, we show that the developed market evidence on the role of VCs in EM is not directly applicable to emerging markets like China, where there is extensive government influence and weak investor protection.

The rest of the paper is organized as follows. Section 2 provides the hypotheses development and related literature. Section 3 describes the data sample and variables used. Section 4 presents the empirical results and robustness tests. The relation between politically connected VCs, VC exits, and post-IPO performance is explored in Sections 5 and 6 concludes.

2. Institutional background and hypothesis development

2.1. Institutional background

The Chinese government started to promote VCs to fill the SME finance gap in the mid-1980s, but experienced slow initial development with central and local government VC firms being major players. The first breakthrough occurred in the late 1990s, when private capital was permitted to invest in VC funds, while the introduction of the SME Board in 2004 and the Venture Board[3] in 2009 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 flowing 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; Hellmann and Puri, 2002). However, China's formal institutions (e.g., laws, rules, and regulatory and enforcement regime) are still largely underdeveloped (Ahlstrom and Bruton, 2006). Under such institutional environment, investments in entrepreneurial firms are more risky for VC investors. In addition, China's VC market is characterized by the prevalence of government involvement. 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. While 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[4] (Guo, 2008). The Chinese government also exerts strict administrative control over the IPO process. This requirement gives government officials substantial discretion which creates room for political connections to play a role in the IPO selection process (Yang, 2013; Liu et al., 2013). Given the extent of government intervention, connected VCs may add more value to their funded firms by bringing the required government relations (including the CSRC[5]), and networks with domestic suppliers and customers (Lu and Tan, 2012). Indeed, Humphery-Jenner and

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[1] Top managers of government-controlled VCs hold 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.

[2] 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 to as 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 (the limited partnership organizational form has been legal since June 2007).

[3] The Shenzhen Venture Board (also known as ChiNext) has lower listing requirements than the SME Board in terms of profitability, asset size and share capital. To qualify for listing in the Venture Board, firms are required to be profitable in the last two consecutive years with aggregate net profit no less than RMB 10 million (approximately US$1.6 million) and to be in continued growth. While the SME Board requires firms to be profitable in the last three years and have aggregate net profit of more than RMB 30 million. In addition, the Venture Board only requires a minimum post-IPO share capital of RMB 30 million, compared to RMB 50 million for new SME Board listings (see www.szse.cn/main/en/listingatSZSE/listingQA/; and Anderson et al., 2015).

[4] For example, Govtor Capital, an active government-owned VC firm in Jiangsu province, manages capital of more than RMB30 billion.

[5] The China Securities Regulatory Committee's (CSRC) approval is required for firms seeking a stock exchange listing.

Suchard (2013) find that the majority of VC-backed IPOs are backed by domestic VCs which have more local connections than their foreign counterparties.[6] In addition, Jiang et al. (2014) find VCs increase IPO proceeds by fulfilling monitoring and certification roles, although younger VCs appear to grandstand when pricing IPOs. Otchere and Vong (2016) provide evidence that both VC-backed and non-VC-backed IPOs are underpriced and underperform in the long run. However, VC-backed IPOs are more underpriced, but have better one-year post-IPO performance compared to non-VC-backed firms, which is consistent with the monitoring role of VCs in China.

2.2. Literature review and hypothesis development

Prior research indicates that IPOs exhibit income-increasing accruals in both the pre-issue and post-issue time periods (e.g., DuCharme et al., 2001, 2004; Teoh et al., 1998a), and documents 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). Studies in China generally document that IPOs engage in severe opportunistic EM in pre- and post-IPO periods (e.g., Aharony et al., 2000; Kao et al., 2009).

The evidence on the role of VC backing on EM in developed markets is mixed. On one hand, some studies support the prediction that active monitoring role of VC firms constrains opportunistic EM of IPO issuers (Hochberg, 2012; Morsfield and Tan, 2006). However, others 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). 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 reputational loss (e.g., Lee and Masulis, 2011; Wongsunwai, 2013).

Although the majority of previous studies have treated the IPO itself as an exit event (e.g., Cumming, 2008), the VC lock-up expiration represents the first opportunity for VCs to sell their investments. Wongsunwai (2013) examines EM at the time of lock-up expiration when incentives to manage earnings upwards are aligned among entrepreneurs and VCs. He finds that companies backed by reputable VCs show less upward EM at the time of lock-up expiration, and lower-quality VC-backed and non-VC-backed IPOs have indistinguishable level of EM in all periods surrounding IPOs.

While political connections facilitate access to information and resources, especially in transitional economies; the impact of political connections on EM is limited and mixed. Chaney et al. (2011) use accounting data from 19 countries and find that politically connected firms are associated with lower earning quality. Chi et al. (2016) show that firms with political connected CEOs engage in lower accrual management but higher real earnings management in China. Yang (2013) studies Chinese mainland companies listed on the Hong Kong Stock Exchange and find no evidence of political connections affecting the probability of firms' fraudulent financial reporting. While these studies focus on the effect of political connected top managers on financial reporting quality, our study contributes to the literature by investigating the effect of political connections of external investors, namely VC firms, in influencing management decisions regarding EM. Given the weak formal institutions and severe government intervention in the Chinese capital market, entrepreneurs may often need to seek help or advice from politically connected VCs and to exploit the 'relational rent' (De Clercq and Sapienza, 2001). The frequent interaction between entrepreneurs and politically connected VCs are more likely to generate trust and allow connected VCs to play a role in management decisions.

Given the different incentives and motivations between government-controlled VCs and private VCs with political connections on the management level, we develop hypotheses separately for these two types of political connected VCs.

2.2.1. 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, government-controlled VCs are usually burdened with a variety of additional conditions that may seek to promote public or political 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 et al., 2008). Second, managers of government-controlled VCs generally have no ownership of the VC firms. The compensation to investment managers typically consists of fixed salary and bonuses which are determined by project performance.[7] 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, SOE managers or government-affiliated persons who may not have appropriate expertise in selecting and assisting entrepreneurial firms. However, their future career prospects are usually based on the performance during their employment time (Aharony et al., 2000; Fan et al., 2007; Hung et al., 2012). Consequently, top managers may have greater incentives to inflate their performance by encouraging EM of their portfolio firms at the IPO year. Finally, compared to privately-controlled VCs, managers of government-controlled VCs may be less concerned with future fundraising activities as the government provides access to future

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[6] Foreign VCs in China prefer to exit their investments in foreign stock markets (including the Hong Kong Stock Exchange), since they are better connected with key intermediaries, more experienced and knowledgeable than domestic VCs are about developed markets (e.g. Humphery-Jenner and Suchard, 2013; 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.

[7] For example, if investment managers exit their investments through IPOs, they are able to receive a small portion (2–5%) of the net profits generated from exiting their investments.

funding. Thus these managers may be less concerned with any negative consequences associated with higher EM in their portfolio firms.

In China, both the management and VC investors are typically subject to one-year lock-up period. Liu et al. (2013) argue that Chinese VCs are more opportunistic and more likely to exit shortly after the lock-up expiration compared to those in developed markets. Therefore, we further predict that IPOs backed by government-controlled VCs that plan to sell immediately after the lock-up expiration would engage in more severe EM during the IPO year to maximize the value of the shares. Therefore, we introduce the following two related hypotheses:

H1. IPOs backed by government-controlled VCs engage in greater EM than do other IPO issuers.

H1a. The higher IPO-year EM in companies backed by government-controlled VCs is positively related to VC exits after the lock-up expiration.

2.2.2. Private VCs with political connections and EM

We anticipate that companies backed by private VCs with management-level political connection engage in EM to a less extent than other IPO issuers. Compared with government VCs, private VCs with political connections can maintain autonomy while accessing valuable resources and projects (Okhmatovskiy, 2010). They are less likely to be under government pressure to invest in government-favored industries/sectors. Compared with non-connected private VCs, connected private VCs are more likely to receive recognition in the political media (Fan et al., 2007), are more reputable and enjoy greater success in transitional markets (Anderson et al., 2017). Thus, grandstanding effect in connected private VCs may be less evident than that in non-connected private VCs. In addition, since top managers or general partners of these VCs are generally founders or hold partial ownership of the VC firm, they are more likely to maintain a longer-term perspective and value their reputation that has been earned over time.

Furthermore, private VCs are more likely to employ high-powered incentive compensation contracts that are similar to the US practice[8] (PE Daily, 2013). Since top managers' compensation and reputation are closely aligned to their performance, they are likely to be more concerned with the long-term success of portfolio firms. Consequently, they may have strong incentives to constrain EM of new ventures they invested and ensure that severe EM behavior does not occur. Given that private VCs have greater incentives to signal the market their capabilities and quality, we further predict that the degree of EM in IPOs backed by connected private VCs is not significantly related to VC exits after the lock-up expiration. Therefore, we introduce the following two related hypotheses:

H2. IPOs backed by private VCs with political connections engage in less EM than do other IPO issuers.

H2a. The lower IPO-year EM in companies backed by private VCs with political connections is not significantly related to VC exits.

3. Data, variables and methodology

3.1. Data and sample distribution

Our sample consists of all IPOs listed on the SME and Venture Boards in the Shenzhen Stock Exchange (SZSE) from 2006 to 2012. We exclude IPOs listed before 2006 because a book-building pricing system was introduced in 2005.[9] IPOs on the main boards of the Shanghai Stock Exchange and SZSE are excluded, as they are mostly large state-owned firms. Three financial service IPOs are excluded due to different financial disclosure requirements and performances compared to other issuers. We also exclude 129 state-owned IPOs, since a lower EM in these firms does not necessarily reflect the strong role of VC monitoring (Cao et al., 2014). The final sample includes 885 IPOs listed during 2006–2012. The relevant data of this study 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.

To identify VC-back IPOs, we first 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 these are typically established to execute staff stock incentives schemes (Zhang and Li, 2011). IPO issuers that are backed by VCs which are owned by their lead underwriters are not referred to as VC-backed since the role of such VCs are different than other VCs.[10] After these controls, 393 IPOs are identified as VC-backed,[11] among which 112 are backed by lead government controlled VCs[12] and 149 backed by lead privately controlled VCs

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[8] General partners charge 15–20% of net profits as carrier interests and 1.5–2.5% as annual management fees.

[9] Liu et al. (2014) find that IPO-year EM decreases after the abolition of fixed-price offering systems and the introduction of a book-building system. To remove the effect of the change in IPO regulation process on EM, we remove 51 IPOs listed before 2006. However, our key results remain unchanged if we include all SME IPOs.

[10] The main results remain unchanged when we include IPOs backed by VCs that are owned by lead underwriters.

[11] This study uses a broad definition of VC and includes both venture capital and private equity.

[12] As in Cao et al. (2013), lead VC is identified as one with the largest investment. Government-controlled VCs are those with controlling shareholders as the government or its various entities. The majority of government controlled VCs in our sample are local government controlled VCs. In unreported results, we find that local government-controlled VCs and SOE-controlled VCs are associated with IPOs with higher EM while central government-controlled VCs have no significant impact on our EM measures.

with management-level political connections. To define the political connections of management in privately-owned VC firms, we first ensure the lead VC firms are privately-owned and not state-owned. Following Fan et al. (2007), Sun et al. (2011) and Anderson et al. (2017), we measure the management-level political connection using a dummy variable. It equals one where the VC firm's 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), and zero otherwise. Appendix A presents the definitions of variables included in this study.

Table 1 reports the sample distribution by year and industry. Panel A shows there are more observations for the later periods due to the introduction of the Venture Board in October 2009. Panel B presents the industry distribution of our sample firms based on the CSRC industry classification method. The majority of sample firms are from manufacturing and IT industries, accounting for approximately 74% and 14% of the total sample firms respectively.

3.2. Measurement of EM

3.2.1. Accrual-based EM measures

We estimate abnormal accruals using a cross-sectional modified Jones model (Jones, 1991, modified as in Dechow et al., 1995). Similar to Hribar and Collins (2002) and Liu and Lu (2007), we measure total accruals (TAC) using a cash flow approach, in which TAC equals the difference between net income (NI) and cash flow from operations (CFO). Specifically, we take the residual term from estimating the following regression:

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

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; 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}.

Eq. (1) is estimated first by excluding all IPO firms in IPO year, and then it is regressed by industry and year. Consistent with Chahine et al. (2012), we require each IPO firm to have at least 10 industry-matched firms. In Eq. (1) α_0, α_1, and α_2 are obtained as firm-specific 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.

Table 1
Sample distribution.
The sample includes 885 IPOs listed on the SME and Venture Boards from 2006 to 2012. Panel A presents the frequency distribution of IPOs by listing year, and Panel B presents the industry distribution of our sample firms. All variables are defined in Appendix A.

Panel A: distribution by IPO listing year

Listing year	Full sample		VC	Non-VC	Gov VCs	Private VCs with PC	Private VCs without PC	VC exits	No VC exits
	Freq	%	Freq	Freq	Freq	Freq	Freq	Freq	Freq
2006	31	3.5	9	22	4	0	5	5	4
2007	72	8.14	20	52	11	6	3	10	10
2008	58	6.55	19	39	5	9	5	6	13
2009	79	8.93	40	39	13	16	11	18	22
2010	291	32.88	127	164	42	42	43	42	85
2011	233	26.33	110	123	27	44	39	42	68
2012	121	13.67	68	53	10	32	26	26	42
Total	885	100	393	492	112	149	132	149	244

Panel B: distribution by industry

Industry	Full sample		VC	Non-VC	Gov VCs	Private VCs with PC	Private VCs without PC	VC exits	No VC exits
	Freq	%	Freq	Freq	Freq	Freq	Freq	Freq	Freq
Agriculture	14	1.58	6	8	1	2	3	2	4
Mining	10	1.13	5	5	1	4	0	3	2
Manufacturing	652	73.67	284	368	84	96	104	101	183
Utilities	2	0.23	0	2	0	0	0	0	0
Construction	19	2.15	8	11	2	5	1	4	4
Transportation	5	0.56	3	2	1	0	2	2	1
IT	122	13.79	62	60	19	28	15	24	38
Wholesale and retail	17	1.92	7	10	0	5	2	4	3
Real estate	5	0.56	1	4	1	0	0	1	0
Social service	27	3.05	14	13	3	6	5	7	7
Media	11	1.24	3	8	0	3	0	1	2
Conglomerates	1	0.11	0	1	0	0	0	0	0
Total	885	100	393	492	112	149	132	149	244

We also estimate abnormal accruals using 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 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 that for its industry-year-performance matched firm. Both modified Jones and performance matched DAC are winsorized at the 1st and 99th percentiles to reduce the outlier effect.

3.2.2. Real EM measures

Roychowdhury (2006) finds companies avoiding reporting annual losses by engaging in real EM methods, namely sales manipulation through increased price discounts and/or more lenient credit terms, overproduction to lower the costs of goods sold, or reducing discretionary expenditures to improve reported margins. To capture real EM, we first generate the normal levels of CFO, production costs, discretionary expenses using the model implemented by Roychowdhury (2006). To estimate these variables, we run the following cross-sectional regressions for each industry and year. We follow the CSRC industry classification method, which includes 12 industries. They are Agriculture, Mining, Manufacturing, Utilities, Construction, Transportation, IT, Wholesale and retail, Real estate, Social service, Media and Conglomerates.

$$CFO_t/TA_{t-1} = a_0 + a_1(1/TA_{t-1}) + a_2(Sales_t/TA_{t-1}) + a_3(\Delta Sales_t/TA_{t-1}) + \varepsilon_t \tag{2}$$

$$PROD_t/TA_{t-1} = a_0 + a_1(1/TA_{t-1}) + a_2(Sales_t/TA_{t-1}) + a_3(\Delta Sales_t/TA_{t-1}) + a_4(\Delta Sales_{t-1}/TA_{t-1}) + \varepsilon_t \tag{3}$$

$$DISX_t/TA_{t-1} = a_0 + a_1(1/TA_{t-1}) + a_2(Sales_t/TA_{t-1}) + \varepsilon_t \tag{4}$$

In the above equations, CFO_t is cash flow from operations in period t; $PROD_t$ is the production costs at period t, defined as the sum of cost of goods sold and change in inventories. $DISX_t$ represents the discretionary expenditures[13] in period t. The abnormal cash flow (AB_CFO), abnormal production costs (AB_PROD), and abnormal discretionary expenditure (AB_DISX) are computed as difference between the actual values and the normal levels predicted from Eqs. (2)–(4). Given sales levels, companies that conduct real activities manipulation are likely to have one or all of these characteristics: unusually low cash flow from operation, and/or unusually high production costs, and/or unusually low discretionary expenses (Roychowdhury, 2006; Cohen and Zarowin, 2010).

3.3. Factors influencing EM

We control for a number of factors commonly adopted in the EM literature. For IPO firm characteristics, we control for IPO issuer's political connections. In particular, we use a dummy variable *IPOs with PC*, which equals one if the IPO firm's CEO or board chairman has government social network ties. Here, we also follow Fan et al. (2007), Sun et al. (2011) and Anderson et al. (2017) and define these ties as one where the IPO firm's CEO or board chairman is a former government official, a former or current member of the People's Congress, or a former or current member of the People's Political Consultative Conference. The literature shows older firms are expected to have lower EM (Chahine et al., 2012); firms raising more funds are more likely to manage earnings (Chen et al., 2013b); highly leveraged firms manage earnings to avoid restrictive debt covenant (DeFond and Jiambalvo, 1994) and issuers with greater growth potential are generally associated with higher discretionary accruals. Therefore we control for *IPO age* (logarithm of company age from initial founding year to its IPO year), *Gross Proceeds* (logarithm of IPO gross proceeds), *Leverage* (total debt to total assets), and *Growth in sales* (from pre-IPO to IPO year).

We also control for possible monitoring and certification effect of top auditors and prestigious underwriters (e.g., Brau and Johnson, 2009; Lee and Masulis, 2011). *Auditor reputation* is a dummy value of one if IPO firm hires the audit service of a top 6 auditor[14] in China. *Underwriter reputation* is a dummy value of one if lead underwriter is among the top 25% based on its cumulative market share one year before the IPO. Liu and Lu (2007) argue that when CEO is also the chairman, controlling shareholders have larger discretionary power in their financial reporting. Thus, we include *CEO dual* where the CEO is the chairman or an intermediate family member of the chairman. For similar reasons, we include *Largest shareholding*, the percentage of shares held by the largest shareholder. Lastly, we include dummy variable *Venture Board*, if the IPO is listed on the Venture Board, to control for the two different listing boards. Year and industry fixed effects control for the changing economic conditions and differences across industries, respectively.

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[13] Income statements of Chinese listed firms do not show separate items for advertising, R&D, and SG&A expenses as their US counterparties do. In this paper, we use the general and administrative expenses as a proxy for discretionary expenses, and we acknowledge that this item might not accurately capture the level of discretionary expenses of our sample firms.

[14] 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., 2013b). 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.

Table 2

Summary statistics.

This table presents sample statistics for 885 IPOs listed on the SME and Venture Boards from 2006 to 2012. Panel A reports IPO firm characteristics for the whole sample, while Panel B presents IPO firm characteristics for subsamples. Panel C shows the lead VC-related characteristics. Only means are reported in Panels B and C. All variables are defined in Appendix A. 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

	Obs.	Mean	Median	S.D.	Min	Max
Total assets (RMB m)	885	690.454	423.100	1889.935	68.516	52,960
IPO age	885	11.662	10.303	6.153	3.903	57.606
IPOs with PC	885	0.312	0.464	0	0	1
Growth in sales	885	0.435	0.892	0.210	−0.633	3.157
Leverage	885	0.452	0.456	0.163	0.018	0.943
Gross proceeds (m)	885	693.957	532.470	552	38.70	5940
Auditor reputation	885	0.206	0	0.404	0	1
Underwriter reputation	885	0.458	0	0.498	0	1
CEO dual	885	0.610	1	0.488	0	1
Largest shareholding	885	0.490	0.480	0.181	0.070	0.968
Venture Board	885	0.384	0	0.487	0	1

Panel B: IPO firm characteristics for subsamples

	VCs	Non-VCs	Diff	VCs with PC	VCs without PC	Diff	Gov VCs	Private VCs with PC	Diff
	[1]	[2]	[3] = [1] − [2]	[4]	[5]	[6] = [4] − [5]	[7]	[8]	[9] = [7] − [8]
Total assets (RMB m)	609.829	754.856	−145.027	558.878	710.032	−151.154***	556.911	560.836	−3.925
Offer price	25.431	23.68	1.751*	25.468	25.345	0.123	23.79	26.74	−2.95*
IPO age	11.554	11.749	−0.195	11.322	11.988	−0.666	11.468	11.234	0.234
IPOs with PC	0.316	0.309	0.007	0.309	0.326	−0.017	0.321	0.302	0.019
Growth in sales	0.468	0.409	0.059	0.492	0.413	0.079	0.487	0.503	−0.016
Leverage	0.443	0.458	−0.015	0.431	0.467	−0.036*	0.463	0.408	0.055***
Pre-IPO ROA	0.146	0.15	−0.004	0.146	0.147	−0.001	0.135	0.156	−0.021**
Gross proceeds (m)	733.304	662.528	70.776**	700	790.683	−90.683	648.221	719.366	−71.145
Auditor reputation	0.211	0.201	0.01	0.213	0.205	0.008	0.196	0.228	−0.032
Underwriter reputation	0.494	0.429	0.065*	0.519	0.492	0.027	0.429	0.544	−0.115**
CEO dual	0.667	0.565	0.102***	0.652	0.689	−0.037	0.625	0.678	−0.053
Largest shareholding	0.459	0.515	−0.056***	0.451	0.472	−0.021	0.437	0.463	−0.026
Venture board	0.461	0.323	0.137***	0.481	0.424	0.057	0.429	0.517	−0.088

Panel C: lead VC characteristics

	VCs	VCs with PC	VCs without PC	Diff	Gov VCs	Private VCs with PC	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*

Table 2 presents summary statistics of our sample firms. Panel A reports IPO firm characteristics for the whole sample. Around 31.2% of IPOs have politically connected CEOs or chairmen. Panel B reports IPO characteristics. Univariate tests compare the characteristics of IPOs backed by VCs and those without VC backing, VCs with and without PCs, and VCs with government-ownership and private VCs with management-level PC, respectively. 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. Similar to Jiang et al. (2014), VC-backed IPOs raise much more funds during IPOs than non-VC-backed IPOs. VCs with PC are associated with smaller IPO firms with lower leverage. Compared with private VCs with management PC, VCs with government ownership are associated with IPO issuers with higher pre-IPO leverage and lower pre-IPO ROA. Panel C presents lead VC characteristics of the sample. It shows that VCs with ownership PC are older, more reputable as measured by prior market share of IPO exits, and invest in portfolio firms longer. VCs without PC are much younger and less reputable than VC with PC. Lastly, approximately half of VC-backed IPOs are subject to VC lock-up sale within six-month following VC lock-up expiration, and VC ownership at the different time is insignificantly different among IPO subsamples.

4. Empirical analysis

4.1. Descriptive statistics for EM measures

The fiscal year 0 is the IPO year, so fiscal year 0 includes both pre- and post-IPO information. Fiscal year 0 has special significance since it is the period during which pre-IPO shareholders[15] who plan to sell their shares following lock-up expiration are more likely to encourage income-increasing EM in an attempt to boost share prices. The expiration of the lock-up happens sometime in fiscal year 1. Fig. 1 illustrates the timing convention. The financial statement information (e.g., current accruals, total assets) for DAC0 is taken from fiscal year 0.

Table 3 reports the descriptive statistics for our EM measures. The results show that IPO issuers engage in severe accrual manipulation at fiscal year 0, with both modified Jones and performance matched DAC significantly positive. The results on real EM measures show mixed results. While IPO issuers on average exhibit negative abnormal cash flow from operations and negative discretionary expenses (indicating upward real EM), they have negative abnormal production costs (indicating downward real EM). Wongsunwai (2013) argue that EM through manipulation of production schedules is unlikely to occur in the context of IPOs, because IPOs are still at early stages in their life cycles.

The univariate tests show that there is no significant difference between VC and non-VC-backed IPOs, either in the form of accrual or real EM. However, when compared with non-VC backed IPOs, the subsample of government VC-backed IPOs exhibit higher upward EM, reflected by higher abnormal accruals and lower abnormal cash flows from operations. In contrast, IPOs backed by private VCs with management-level political connection exhibit the lowest levels of EM among sub groups, reflected by lower abnormal accruals and higher abnormal cash flows. Table 3 also shows that the level of EM is higher for IPOs that are subject to VC exits than those not subject to VC exits.[16]

4.2. Multiple regression analysis of EM

Table 4 presents the OLS estimates.[17] The dependent variable for columns 1–4 is the IPO-year modified Jones DAC, and for columns 5–8 is real EM (R_EM), measured as AB_CFO multiplying −1.[18] Higher modified Jones DAC and higher R_EM (lower AB_CFO) indicate higher level of accrual and real EM, respectively. In columns 2 and 6, we observe that the coefficients of Gov VCs are significantly positive, indicating that IPOs backed by government VCs engage in both accrual and real EM to a greater extent than other IPO issuers. Specifically, government VC-backed IPOs exhibit abnormal accruals of 5.2% of total assets higher and abnormal cash flows of 5.7% of sales lower than other IPO issuers. The negative coefficients for private VCs with PC in columns 3 and 6 suggest that IPOs backed by connected private VCs have abnormal accruals of 6% lower and abnormal cash flows of 4.5% higher than other IPO issuers. Thus, our H1 and H2 are supported. The results also show that VCs on average have insignificant impact on our EM measures.[19]

To examine the effect of VC exits on IPO-year EM, we further include VC exits, a dummy variable that takes a value of one if the VC sells any proportion of its holdings within six months of the lock-up expiration and 0 otherwise. We interact VC exits with VC dummy, Gov VCs, and Private VCs with PC. We further control for the IPO management partial cashing-out subsequent to the IPO, since the upward EM works in favor of the IPO management who wishes to sell some personal holdings after the one-year lock-up period has expired. Specifically, we include IPO management sale, a dummy variable that takes a value of one if the management of issuers sell any proportion of its holdings within six months of the lock-up expiration. The regression results are reported in Table 5. In Column 1, the coefficient of VC exits is significantly positive, indicating that IPOs subject to immediate VC exit have higher abnormal accruals than non-exits IPOs. The interaction variable is significantly positive for Gov VCs, while insignificant for Private VCs with PC. Gov VC is no longer significant, while private VCs with PC continues to be significantly negative. These results suggest that the high IPO-year EM in companies backed by government VCs is mainly driven by these VCs partially cashing out subsequent to lock-up expiration, whereas subsequent exits from connected private VCs are not significantly related to IPO-year EM. Therefore, H1a and H2a are supported.

With regard to control variables, the results show that the coefficients on leverage are significantly positive. This is consistent with the literature that IPOs with higher pre-IPO leverage are more likely to manage earnings upward. IPO age is negatively related to IPO-year EM at the 5 or 10% significance level, suggesting that older firms are less likely to manage earnings upward. IPO
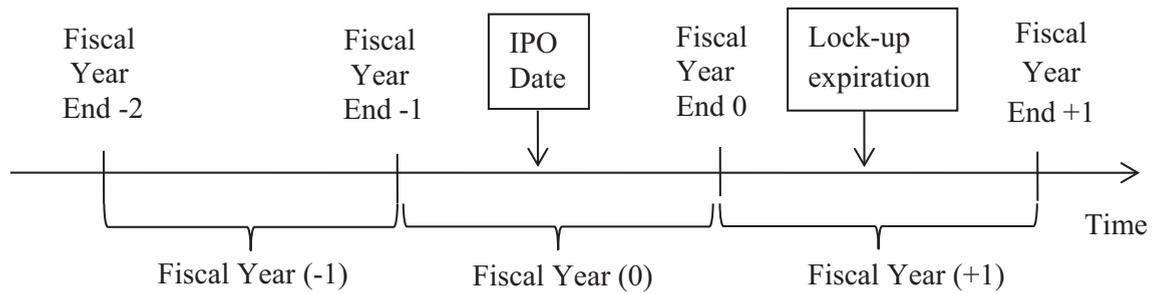
Fig. 1. Timeline for portfolio firms going public.

management sale is significantly positive, suggesting that IPOs are more likely to engage in income-increasing EM if their management plans to sell shares immediately after the lock-up expiration.[20]

Larger equity sell-downs of VCs' shareholdings may emerge in firms exhibiting greater pre-IPO EM. To reflect the size of equity sales, we construct a continuous *VC exit size* variable, which is equal to the proportion of shares VCs sold in the six months after the lock up period, scaled by the size of VC's pre-IPO equity stake. The results are qualitatively similar, with *Gov VCs* being significantly associated with upward accrual and real EM, and *Private VCs with PC* continuing to be negatively associated with both accrual and real EM. Further, in Model [4] of the modified Jones DAC regression containing all control variables, *VC exit size* is positively associated with EM. However, the interaction variables are no longer significant. For example, for Model [2] the interaction variable, the coefficient of *VC exit size * Gov VCs* has a *p*-value of 0.104 and is therefore marginally outside of the 10% significance level. Our equity sales data is only for six months following the lock-up expiration, and this relatively short time frame may not reflect the true extent of the VCs intentions to exit the firm. Therefore, *VC exits* dummy variable may better detect the VC's true longer-term ownership intentions.[21]

4.3. Robustness tests

4.3.1. Heckman two-stage approach

The results in Tables 4 and 5 do not rule out the possibility that the statistical significance is driven by selection bias between entrepreneurs and VC firms. It may be that firms with better reporting quality are more likely to receive VC financing. Following Lee and Wahal (2004) and Morsfield and Tan (2006), we employ a Heckman two-stage procedure to control for such a bias.

In the first stage of the Heckman model, we employ a probit regression to estimate the probability that a firm is likely to receive VC financing.[22] We then use the estimate of the probit value to calculate the inverse mills ratio, which is then added to our main regression model as an additional variable. If there is a self-selection issue, we expect the inverse mills ratio to be statistically significant. Our first stage estimates the probability of receiving VC financing as a function of *year09*, a dummy that takes a value of one if firms are listed after 2009. Lu et al. (2013) argue that domestic VCs grew rapidly and regained market-dominant position after the launch of the Venture Board in 2009. Thus, firms that were listed after 2009 are more likely to receive VC financing. We also include the location of portfolio firms in the first stage. Prior studies have examined the importance of geographical proximity for startups to obtain VC financing and the tendency of VCs to cluster in certain locations (e.g., Gompers and Lerner, 2002). Thus, companies located in areas where VCs tend to cluster are more likely to receive VC funding (Hochberg, 2012; Wongsunwai, 2013). Firm characteristics such as *IPO age, gross proceeds, growth in sales, leverage, auditor and underwriter reputation, largest shareholding,* and *CEO dual* are also included in the first stage to predict the likelihood of receiving VC financing.

Panel A of Table 6 presents the regression results for the Heckman procedure. In the first stage, we find that entrepreneurial firms with less proportion of shares held by the largest shareholders and listed after 2009 are more likely to receive VC funding. For the second stage, we add the inverse mills ratio into the regressions employed in Tables 4 and 5. The inverse mills ratio is significant in columns 2 and 4, suggesting that these models are impacted by self-selection bias. We find that after we control for self-selection bias, there is no significant change in our results. The coefficient on *Gov VC* and *private VCs with PC* remain statistically significant. Once control for VC exits, the presence of *Gov VCs* is uncorrelated with our EM measures, while *private VCs with PC* remains significantly negative, supporting our earlier findings in Tables 4 and 5.

4.3.2. Propensity score matching

In addition to the Heckman two-stage approach, we follow Lee and Masulis (2011) by controlling selection bias using the propensity score matching (PSM) approach. Lee and Masulis (2011) argue that though Kothari performance matched DAC mitigate

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[20] Profit forecasts are important benchmarks for EM. Graham et al.'s (2005) survey finds that financial executives attach a high importance to meeting earnings targets such as analyst forecasts. Roychowdhury (2006) finds some evidence that managers use real earnings management to meet or beat annual analyst forecasts. However, analyst forecasts are particularly sparse in our sample period from 2006 to 2012, with only six profit forecasts by IPO firms.

[21] We thank the anonymous referee for this suggestion. The results are available from the authors on request.

[22] In unreported results, we also estimate the probability of a firm receiving financing from VCs with political connections and find similar results.

Table 3
Descriptive statistics for EM measures.
This table presents statistics for accrual-based and real EM measures. The differences in means and medians are based on the independent *t*-tests and Wilcoxon tests, respectively. Variable definitions are included in Appendix A. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

EM measures		Accrual-based EM		Real EM		
		Modified Jones	Performance matched	AB_CFO	AB_PROD	AB_DISX
Sample		[1]	[2]	[3]	[4]	[5]
All	Mean	0.089	0.047	−0.016	−0.021	−0.054
	Median	0.063	0.025	0.004	−0.053	−0.051
VC-backed	Mean	0.093	0.051	−0.017	−0.032	−0.060
	Median	0.067	0.027	0.003	−0.053	−0.048
Gov VCs	Mean	0.134	0.099	−0.067	−0.052	−0.044
	Median	0.087	0.046	−0.028	0.001	−0.048
Private VCs with PC	Mean	0.044	−0.003	0.038	−0.127	−0.069
	Median	0.029	0.001	0.037	−0.081	−0.041
Private VCs without PC	Mean	0.115	0.071	−0.038	0.091	−0.062
	Median	0.096	0.057	−0.029	−0.046	−0.053
Non-VC-backed	Mean	0.085	0.043	−0.015	−0.011	−0.049
	Median	0.062	0.024	0.005	−0.056	−0.053
VC exits	Mean	0.126	0.083	−0.055	0.032	−0.059
	Median	0.093	0.059	−0.064	−0.022	−0.052
No VC exits	Mean	0.074	0.031	0.005	−0.072	−0.06
	Median	0.058	0.012	0.014	−0.065	−0.041
Differences						
VC-backed *less* non-VC backed	Mean	0.008	0.007	−0.002	−0.021	0.008
	Median	0.005	0.003	−0.002	0.003	0.008
Gov VCs *less* non-VC backed	Mean	0.049***	0.055***	−0.052**	−0.041	0.004
	Median	0.025**	0.022**	−0.033**	0.057**	0.005
Gov VCs *less* private VCs with PC	Mean	0.090***	0.102***	−0.105***	0.075	0.025
	Median	0.058***	0.045***	−0.065***	0.082***	−0.007
Gov VCs *less* private VCs without PC	Mean	0.019	0.028	−0.029	−0.143	0.018
	Median	−0.009	−0.011	0.001	0.047	0.005
Private VCs with PC *less* non-VC-backed	Mean	−0.041***	−0.046***	0.053***	−0.116*	−0.020
	Median	−0.033***	−0.023**	0.032**	−0.025*	0.012
Private VCs with PC *less* private VCs without PC	Mean	−0.071***	−0.074***	0.076***	−0.218***	−0.007
	Median	−0.067***	−0.056***	0.066***	−0.035***	0.012
VC exits *less* no VC exits	Mean	0.052***	0.052***	−0.060***	0.104	0.001
	Median	0.035***	0.047***	−0.078***	0.042	−0.011

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. The PSM approach, designed for multi-dimensional matching, can not only account for all the important factors, but also address the potential selection bias 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 *Gov VCs*, *private VCs with PC* and *private VCs without PC*. The issue characteristics in the first stage include *IPOs with PC*, *IPO age*, *gross proceeds*, *leverage*, *growth in sales*, *auditor and underwriter reputation*, *CEO dual*, *largest shareholding*, *Venture Board*, industry 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).

Panel B of Table 6 presents ATT of EM measures, modified Jones abnormal accruals and R_EM. Consistent with earlier results, IPOs backed by government VCs and those subject to subsequent VC exits engage in significantly higher IPO-year EM than other IPO issuers. On the other hand, companies backed by connected private VCs are associated with lower IPO-year EM. These results confirm our earlier findings.

4.3.3. Significant VC ownership and EM

Chung et al. (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 only include IPOs with more than 5%[23] owned by lead VCs as VC-backed IPOs. In an unreported table, we find consistent results. Government VCs that have

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[23] 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 be submitted (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.

Table 4

Estimates of VC associations with EM measures.

This table presents the OLS estimates for 885 IPOs occurring during 2006–2012 in the SME and the Venture Boards. The dependent variable for columns 1–4 is the IPO-year DAC estimated from the modified Jones model, and for columns 5–6 is R_EM, measured as the abnormal level of operating cash flow multiplying negative one. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. All variables are defined in Appendix A, and Intercepts are not reported. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	Modified Jones DAC				R_EM			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
VC dummy	0.002				0.011			
	(0.851)				(0.405)			
Gov VCs		0.052***		0.046**		0.057**		0.054**
		(0.006)		(0.018)		(0.030)		(0.044)
Private VCs with PC			−0.060	−0.048***			−0.045***	−0.032**
			(0.000)	(0.000)			(0.003)	(0.045)
VCs without PC				0.020				0.022
				(0.200)				(0.200)
IPOs with PC	0.001	0.001	0.003	0.002	0.019	0.019	0.021	0.02
	(0.929)	(0.955)	(0.816)	(0.854)	(0.143)	(0.142)	(0.110)	(0.128)
IPO age	−0.021*	−0.021*	−0.022	−0.021*	−0.028*	−0.028*	−0.028*	−0.028*
	(0.079)	(0.078)	(0.062)	(0.065)	(0.063)	(0.060)	(0.053)	(0.056)
Ln(gross proceeds)	0.040***	0.040***	0.042***	0.041***	−0.049***	−0.048***	−0.047***	−0.048***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Growth in sales	−0.010	−0.011	−0.009	−0.009	−0.002	−0.003	−0.002	−0.002
	(0.144)	(0.120)	(0.171)	(0.146)	(0.788)	(0.744)	(0.847)	(0.788)
Leverage	0.100***	0.094***	0.091**	0.085**	0.377***	0.372***	0.371***	0.361***
	(0.005)	(0.008)	(0.012)	(0.015)	(0.000)	(0.000)	(0.000)	(0.000)
Auditor reputation	−0.011	−0.01	−0.011	−0.010	−0.016	−0.016	−0.016	−0.015
	(0.393)	(0.408)	(0.400)	(0.413)	(0.289)	(0.293)	(0.288)	(0.309)
Underwriter reputation	−0.004	−0.003	−0.001	−0.001	−0.007	−0.006	−0.004	−0.005
	(0.739)	(0.768)	(0.904)	(0.906)	(0.615)	(0.662)	(0.739)	(0.709)
Largest shareholding	−0.045	−0.036	−0.053*	−0.044	−0.033	−0.026	−0.042	−0.028
	(0.119)	(0.214)	(0.071)	(0.131)	(0.348)	(0.455)	(0.221)	(0.428)
CEO dual	0.007	0.006	0.009	0.008	0.007	0.008	0.01	0.008
	(0.536)	(0.556)	(0.391)	(0.429)	(0.569)	(0.540)	(0.422)	(0.531)
Venture Board	0.002	0.000	0.005	−0.003	−0.007	−0.009	−0.004	−0.007
	(0.895)	(0.989)	(0.715)	(0.815)	(0.633)	(0.592)	(0.780)	(0.646)
Industry and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.047	0.059	0.066	0.075	0.16	0.168	0.166	0.173
Obs.	885	885	885	885	885	885	885	885

more than 5% of shares before issuing are associated with IPOs engaging in higher EM, while connected private VCs are associated with firms engaging in lower EM than other IPO issuers.

5. VCs with political connections, EM and long-run performance

The previous results show that companies backed by government-controlled VCs that plan to exit immediately after lock-up expiration are more likely to engage in severe IPO-year EM. On the other hand, private VCs with political connections are associated with IPOs with lower EM. Prior evidence from developed markets shows that IPO issuers who manage earnings opportunistically have worse performance in the long run (e.g. Teoh et al., 1998b; Chahine et al., 2012). Therefore, we continue to investigate the effects of *VC exits*, *Gov VC* and *private VCs with PC* on post-IPO performance. We calculated monthly abnormal returns as an 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 markets.[24] The two-year post-issue cumulative abnormal returns (CAR_2YEARS) are then calculated as the sum of the consecutive monthly abnormal returns from the month immediately after the month of IPO. We use return on assets two years after listing (ROA_2YEARS)[25] to measure IPO operating performance.

Table 7 presents the treatment adjusted CAR_2YEARS and ROA_2YEARS for IPOs backed by different types of VCs. 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. The results show that government VCs that at least partially exit their shareholdings are associated with IPO issuers having lower CARs and ROA two years after listing. Companies backed by connected private VCs without partial exits exhibit significantly higher two-year CARs than other IPO issuers (ROA is not significantly different).

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[24] 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.

[25] We also look at the change in ROA from pre-IPO to two years after listing and find that after adjusting the endogenity choice of VC financing, there is no significant difference among our different groups of VC-backed IPOs and non-VC-backed IPOs, indicating that VCs in general do not improve IPO operating performance.

Table 5
Estimates of VC exits with EM measures.
This table reports OLS regression results of the impact of VC exits on the IPO-year EM. The dependent variable for columns 1–4 is the IPO-year DAC estimated from the modified Jones model, and for columns 5–6 is R_EM, measured as the abnormal level of operating cash flow multiplying negative one. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. All variables are defined in Appendix A. Intercepts are not reported. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	Modified Jones DAC				R_EM			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
VC dummy	−0.017 (0.163)				−0.019 (0.219)			
Gov VCs		0.010 (0.641)		0.005 (0.830)		0.026 (0.157)		0.024 (0.416)
Private VCs with PC			−0.064*** (0.000)	−0.053*** (0.001)			−0.054*** (0.006)	−0.041** (0.041)
Private VCs without PC				−0.001 (0.970)				−0.002 (0.916)
VC exits	0.051*** (0.003)			0.055** (0.045)	0.061*** (0.005)			0.064** (0.030)
VC exits * Gov VCs		0.102*** (0.006)		0.046 (0.332)		0.076 (0.107)		0.010 (0.876)
VC exits * private VCs with PC			0.017 (0.441)	−0.039 (0.274)			0.028 (0.276)	−0.038 (0.342)
IPO management sale	0.040*** (0.001)	0.040*** (0.001)	0.038*** (0.002)	0.036*** (0.003)	0.041*** (0.004)	0.040*** (0.005)	0.038*** (0.007)	0.036*** (0.010)
IPO s with PC	−0.001 (0.934)	0.003 (0.807)	0.001 (0.931)	0.002 (0.858)	0.018 (0.169)	0.021 (0.109)	0.019 (0.142)	0.019 (0.143)
IPO Age	−0.021* (0.066)	−0.018 (0.101)	−0.023** (0.048)	−0.020* (0.081)	−0.028* (0.055)	0.027* (0.075)	−0.029** (0.045)	−0.027* (0.068)
Ln(gross proceeds)	0.043*** (0.000)	0.042*** (0.000)	0.044*** (0.000)	0.044*** (0.000)	−0.047*** (0.000)	−0.045*** (0.000)	−0.045*** (0.000)	−0.045*** (0.000)
Growth in sales	−0.008 (0.239)	−0.009 (0.193)	−0.008 (0.228)	−0.008 (0.251)	−0.000 (0.971)	−0.001 (0.896)	−0.000 (0.960)	−0.000 (0.985)
Leverage	0.093*** (0.008)	0.087** (0.013)	0.086** (0.016)	0.078** (0.027)	0.373*** (0.000)	0.366*** (0.000)	0.366*** (0.000)	0.358*** (0.000)
Auditor reputation	−0.009 (0.494)	−0.008 (0.496)	−0.009 (0.443)	−0.007 (0.562)	−0.013 (0.380)	−0.015 (0.346)	−0.015 (0.317)	−0.012 (0.395)
Underwriter reputation	−0.003 (0.787)	−0.002 (0.844)	0 (0.975)	−0.001 (0.892)	−0.007 (0.575)	−0.004 (0.724)	−0.003 (0.803)	−0.005 (0.722)
Largest shareholding	−0.031 (0.283)	−0.022 (0.441)	−0.041 (0.168)	−0.027 (0.355)	−0.019 (0.587)	−0.013 (0.712)	−0.03 (0.385)	−0.014 (0.682)
CEO dual	0.007 (0.525)	0.005 (0.613)	0.01 (0.351)	0.006 (0.567)	0.007 (0.592)	0.007 (0.574)	0.011 (0.382)	0.007 (0.574)
Venture Board	−0.004 (0.777)	−0.003 (0.796)	−0.001 (0.950)	−0.002 (0.882)	−0.015 (0.346)	−0.012 (0.416)	−0.01 (0.525)	−0.012 (0.428)
Industry and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.056	0.084	0.078	0.102	0.176	0.18	0.174	0.188

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 behavior 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, managers of politically connected private VCs who are also typically VC firm owners, have incentives and the necessary influence to constrain EM and improve post-IPO stock performance.

6. Conclusion

This study analyses the effect of VCs on IPO-year EM of 885 entrepreneurial firms in China. The results show that IPO issuers backed by government VCs exhibit severe IPO-year EM. The opportunistic IPO-year EM is predominantly found in firms that experience exits by the VC immediately after the lock-up expiration. Therefore, those IPOs with VCs whose apparent intention is to exit their investments as soon as possible are most likely to engage in 'window dressing' of financial statements and performance during the IPO process. Such IPOs also tend to experience lower stock returns two years after listing. On the other hand, IPOs backed by private VCs with political connections are associated with lower EM and better long-run stock performance, suggesting that private VCs with political connections provide some oversight of management activity. The key results remain unchanged after robustness checks.

Table 6

Correction for endogenous choice of VC financing.

This table presents the results after adjusting for endogenous choice of VC financing. Panel A presents the Heckman two-stage regression results. Column 1 presents the first-stage probit regression results, with VC dummy as the dependent variable. The dependent variable for columns 2–3 is the IPO-year DAC estimated from the modified Jones model, and for columns 4–5 is R_EM, measured as the abnormal level of operating cash flow multiplying negative one. Robust p-values, heteroskedasticity-adjusted, are shown in the parentheses. Panel B presents the endogeneity-adjusted EM measures using the highest propensity score, Gaussian kernel weighting, and Stratification methods. T-values are reported in parentheses. 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 presented in Appendix A. Intercepts are not reported. *, **, ***represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Heckman two-stage regression

	First stage	Modified Jones DAC		R_EM	
	[1]	[2]	[3]	[4]	[5]
Gov VCs		0.046**	0.004	0.054**	0.024
		(0.018)	(0.850)	(0.046)	(0.410)
Private VCs with PC		−0.048***	−0.053***	−0.032**	−0.041**
		(0.000)	(0.001)	(0.46)	(0.042)
VCs without PC		0.020	−0.000	0.021	−0.002
		(0.192)	(0.351)	(0.212)	(0.907)
VC exits			0.056**		0.064**
			(0.043)		(0.032)
VC exits ∗ private VCs with PC			−0.040		−0.037
			(0.264)		(0.351)
VC exits ∗ Gov VCs			0.047		0.009
			(0.323)		(0.884)
IPO management sale			0.036***		0.036**
			(0.002)		(0.011)
IPOs with PC		0.010	0.017	0.004	0.009
		(0.623)	(0.395)	(0.884)	(0.775)
IPO AGE	−0.101	−0.023*	−0.024*	−0.024	−0.025
	(0.337)	(0.062)	(0.264)	(0.122)	(0.114)
Ln(gross proceeds)	0.096	0.056*	0.071**	−0.077**	−0.063
	(0.218)	(0.071)	(0.021)	(0.045)	(0.103)
Growth in sales	0.026	−0.007	−0.004	−0.006	−0.003
	(0.595)	(0.318)	(0.623)	(0.501)	(0.783)
Leverage	0.150	0.095**	0.100**	0.342***	0.344***
	(0.613)	(0.034)	(0.025)	(0.000)	(0.000)
Auditor reputation	−0.020	−0.013	−0.013	−0.009	−0.009
	(0.855)	(0.346)	(0.336)	(0.578)	(0.583)
Underwriter reputation	0.139	0.009	0.018	−0.026	−0.017
	(0.115)	(0.711)	(0.452)	(0.370)	(0.552)
Largest shareholding	−1.168***	−0.13	−0.19	0.148	0.09
	(0.000)	(0.470)	(0.287)	(0.494)	(0.876)
CEO dual	0.255***	0.027	0.043	0.013	0.017
	(0.005)	(0.508)	(0.295)	(0.525)	(0.739)
Venture Board		0.027	0.044	−0.057	−0.042
		(0.595)	(0.390)	(0.356)	(0.495)
Year09	0.354**				
	(0.011)				
Province	−0.004				
	(0.548)				
Inverse mills		0.081*	0.196	0.207*	0.103
		(0.091)	(0.439)	(0.084)	(0.728)
Industry fixed effects	YES	YES	YES	YES	YES
Year fixed effects	NO	YES	YES	YES	YES
R-Square	0.045	0.075	0.103	0.173	0.189

Panel B: propensity score matching

		Obs.	Nearest neighbour	Gaussian	Stratification
Modified Jones DAC					
Gov VCs	Exit	45	0.142***	0.116***	0.142***
			(3.81)	(3.56)	(3.31)
	No exit	67	0.006	−0.002	0.006
			(0.21)	(−0.12)	(0.16)
Private VCs with PC	Exit	61	−0.037	−0.038**	−0.037
			(−1.36)	(−2.15)	(−1.00)
	No exit	88	−0.055**	−0.062***	−0.055*
			(−2.37)	(−4.04)	(0.057)
Private VCs without PC	Exit	43	0.060*	0.058**	0.06

(continued on next page)

Table 6 (continued)

Panel B: propensity score matching		Obs.	Nearest neighbour	Gaussian	Stratification
Modified Jones DAC					
			(1.88)	(2.55)	(1.52)
	No exit	89	0.003	0.006	0.003
			(0.12)	(0.34)	(0.11)
R_EM					
Gov VCs	Exit	45	0.139**	0.108**	0.139**
			(2.66)	(2.22)	(2.11)
	No exit	67	0.039	0.013	0.039
			(1.10)	−0.34	(0.91)
Private VCs with PC	Exit	61	−0.009	−0.025	−0.009
			(−0.29)	(−1.17)	(−0.18)
	No exit	88	−0.057*	−0.064***	−0.057
			(−1.78)	(−2.95)	(−1.61)
Private VCs without PC	Exit	43	0.068*	0.061**	0.067
			(1.82)	(2.30)	(1.38)
	No exit	89	−0.013	0.004	−0.013
			(−0.42)	(0.19)	(−0.35)

Overall, our results suggest that the incentive mechanisms for top managers in government-controlled VCs need to be modified to better align top managers' interests with long-term success of government-controlled VCs and their portfolio firms. To ensure the long-term development of the VC market, Chinese policy makers should continue its current trend of decreasing direct government intervention in its VC markets. Instead of acting as VCs themselves, the Chinese government can encourage privately-controlled and foreign VCs to invest in early-stage and high-tech entrepreneurial firms. This can be done by placing incentive structure, introducing favorable policies for early-stage investments, and strengthening enforcements in laws and regulations. Furthermore, rigorous regulations and disclosure rules are needed to reduce IPO-year EM and provide explicit evidence for detecting and penalizing misreporting behaviors.

Table 7

Post-issue performance-matched CARs and ROA two years after listing.

This table presents treatment adjusted CARs and ROA two years after listing. 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 A.

		Obs.	Nearest neighbour	Gaussian	Stratification
CAR_2YEARS					
Gov VCs	Exit	44	−0.197*	−0.165**	−0.196
			(−1.83)	(−2.07)	(−1.52)
	No exit	65	−0.088	−0.056	−0.087
			(−1.00)	(−0.89)	(−0.81)
Private VCs with PC	Exit	57	0.061	0.061	0.018
			(0.99)	(0.99)	(0.87)
	No exit	82	0.223***	0.212**	0.223**
			(2.90)	(1.98)	(0.016)
VCs without PC	Exit	36	−0.175**	−0.167**	−0.315**
			(−2.60)	(−2.07)	(−2.49)
	No exit	78	−0.014	−0.002	−0.014
			(−0.17)	(−0.03)	(0.892)
ROA_2YEARS					
Gov VCs	Exit	40	−0.013	−0.018*	−0.13
			(−1.03)	(−1.91)	(−0.95)
	No exit	62	0.070	0.000	0.000
			(0.05)	(0.05)	(0.04)
Private VCs with PC	Exit	47	0.003	0.002	0.003
			(0.37)	(0.41)	(0.24)
	No exit	70	−0.004	−0.007	−0.004
			(−0.47)	(−0.85)	(−0.42)
VCs without PC	Exit	36	−0.011	−0.009	−0.011
			(−1.01)	(−0.94)	(−0.73)
	No exit	70	0.004	−0.004	0.004
			(0.52)	(−0.78)	(0.684)

Appendix A. Definition of variables

Variables	Definitions
Accrual-based EM	
Modified Jones DAC	Discretionary accruals are computed by the Modified Jones (1991) model
Performance matched DAC	Discretionary accruals are computed by Kothari et al. (2005) performance matched model
Real EM	
R_EM	Abnormal levels of cash flows from operations multiply negative one
AB_CFO	Abnormal levels of cash flow from operations
AB_PROD	Abnormal levels of production costs, where production costs are defined as sum of cost of goods sold and the change in inventories
AB_DISX	Abnormal levels of discretionary expenses including advertising, R&D, and SG&A expenses
VC dummy	1 = VC-backed IPOs, 0 = otherwise
Gov VCs	1 = the lead VC is funded or controlled by the government, 0 = otherwise
Private VCs with PC	1 = the lead VC is privately controlled and 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
Private VCs without PC	1 = the lead VC is privately controlled and has no political connections, 0 = otherwise
VC exits	1 = the lead VC sells any proportion of its holding during the IPO date and six months following the lock-up expiration, 0 = otherwise
IPO management sale	1 = the IPO management sells any proportion of its holding within six months following the lock-up expiration, 0 = otherwise
IPOs with PC	1 = the CEO or chairman of the IPO issuer has social network ties with the government, 0 = otherwise
IPO age	The logarithm of one plus issuer age, which is measured as the number of years between the establishment date of the IPO firm and the IPO date
Ln(gross proceeds)	The natural logarithm of new issue proceeds (the public float size) which is measured as the product of offer price and the number of new shares issuing
Growth in sales	The percentage change in sales from pre-IPO year to IPO year
Leverage	Total debt to total assets ratio one year before IPO
Auditor reputation	1 = the IPO firm hires the audit service of a top 6 auditor in China, 0 = otherwise
Underwriter reputation	1 = the underwriter of the IPO firm is in the top quartile based on their cumulative market share one year before IPO, 0 = otherwise.
Largest shareholding	Proportion of shares directly and indirectly held by the largest shareholder
CEO dual	1 = the CEO is also the chairman of the IPO company, 0 = otherwise
Venture Board	1 = the IPO is listed on the Venture Board, 0 = otherwise
VC age	The number of years between the establishment date of a VC firm and the IPO date of its backed firm
VC reputation	1 = If a lead VC's prior market share of VC-backed IPOs ranks in the top 25% in the VC market the year prior to an IPO, 0 = otherwise
VC ownership	The percentage of shares held by the lead VC
Syndicate size	The number of VC syndicate members invested in an IPO issuer
VC duration	The number of years from lead VC investment year to IPO
Lock up period > 12 months	1 = the lock-up period of the VC is larger than 12 months, 0 = otherwise
Year09	1 = If the IPO listed after 2009, 0 = otherwise
Province	The location of the IPO firm

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