

## 风险投资、产权性质与上市公司高管薪酬合约<sup>1</sup>

薛爽 唐丰收<sup>2</sup>

投稿日：2013年4月10日 录用日：2013年9月6日  
© 作者 2013。本文由香港理工大学以开放取用(open access)方式出版。

### 摘要

本文系统研究风险投资对上市公司高管薪酬—业绩敏感度及额外薪酬水平的影响。结果发现风险投资显著提高了上市公司高管的薪酬—业绩敏感度，且这种相对较高的薪酬—业绩敏感度也使高管薪酬在与同行业其他公司比较时表现出较高的额外薪酬水平。从上市公司特征看，风险投资对高管薪酬—业绩敏感度与额外薪酬水平的影响主要出现在民营企业。从风险投资自身特征来看，相对于低声誉的风险投资，高声誉风险投资对上市公司高管薪酬—业绩敏感度影响力更强。研究结果总体表明即使在公司 IPO 以后，风险投资仍然会在公司中发挥积极的治理作用，影响高管的薪酬合约。

**关键词：**风险投资、薪酬—业绩敏感度、额外薪酬水平、薪酬合约

**中图分类号：**F276.6、F275、F830.5

---

<sup>1</sup> 感谢国家自然科学基金资助项目（批准号：71172143）和教育部人文社科重点研究基地重大项目(12JJD790037)以及新世纪优秀人才支持计划（NCET-13-0893）的资助。

<sup>2</sup> 薛爽，上海财经大学会计与财务研究院研究员，上海财经大学会计学院教授。Email: xuesh@mail.shufe.edu.cn。唐丰收，上海财经大学会计学院博士生，浙江万里学院副教授。Email: tang\_fsh@163.com。

## 一、引言

风险投资行业的成功被认为是经济增长与创新的重要因素。西方的理论与经验研究都表明风险资本是积极的投资者 (Active Investor) (Barry *et al.*, 1990; Gompers, 1995; Lerner, 1999; Kortum and Lerner, 2000)。相比其他财务中介, 风险投资不仅提供企业发展所需资金, 更重要的是风险投资家利用其专业化的管理经验以及社会网络资源积极参与被投资企业治理与管理, 具体途径包括公司战略决策、公司治理、资本结构和人力资源安排等等 (Fried *et al.*, 1998; Cyr *et al.*, 2000; Wang *et al.*, 2003; Davila and Foster, 2005)。

近年来, 我国政府鼓励风险投资行业的发展, 但风险投资是否能够对被投资企业的公司治理与战略决策产生正面作用及作用的途径如何, 还缺乏更多的经验证据。张学勇、廖理 (2011) 通过比较分析不同背景风险投资机构 (下文简称 VC) 支持的企业在 IPO 时的市场表现, 揭示了外资背景的 VC 在项目选择时更稳健, 对公司治理结构的安排更合理。陈工孟等 (2011) 通过对不同市场背景下风险投资支持的企业的 IPO 抑价率进行比较, 揭示了在国内市场背景下风险投资的“逐名动机” (Grandstanding) 更强烈。然而, 这些研究主要关注 VC 在被投资企业 IPO 之前及 IPO 阶段的具体作用。对于被投资企业 IPO 之后, VC 的作用机制是否依然存在或是否发生变化, 则鲜有研究。因为一般看法是, 风险投资在 IPO 之后会迅速退出。实务中, 由于股权锁定期或者继续持股可以获利, 不少风险投资股东在公司上市后多年仍未退出 (吴超鹏等, 2012)。

吴超鹏等 (2012) 考察了被投资企业 IPO 之后, 风险投资对上市公司投融资行为的影响机制和作用效果, 他们发现, 风险投资的加入不仅可以抑制公司对自由现金流的过度投资, 在一定程度上也缓解了因现金流短缺所导致的投资不足问题。该文开启了 IPO 之后 VC 对被投资企业影响研究的先河。那么, VC 对被投资企业投资决策影响的内在机制是什么? 经理人的薪酬激励合约是影响企业投资政策的重要机制 (Ryan and Wiggins, 2002; Aggarwal and Samwick, 2006; Kang *et al.*, 2006; 辛清泉等, 2007)。那么 VC 的参与是否会通过影响高管薪酬激励机制, 从而引导企业的投资行为? 本文试图从 VC 对经理人薪酬激励的影响来揭示被投资企业 IPO 后 VC 影响其公司治理和管理层决策的途径, 以期对现有文献进行有益的补充。<sup>3</sup>

具体而言, 我们研究在我国特定制度背景下几个重要但尚待回答的问题:

- (1) VC 在上市公司 IPO 后是否会影响高管的薪酬合约?
- (2) 产权性质是影响高管薪酬契约的重要因素 (吴联生等, 2010)。国有企业

<sup>3</sup> 王会娟、张然 (2012) 考察了私募股权投资对被投资企业薪酬合约的影响。不过, 该文没有区分 VC 与一般私募投资者。其实, 即使在中国, VC 与一般私募投资者可能不仅只是概念上的差别, 其投资的具体动机、资源禀赋也存在较为明显的区别。与一般私募投资者相比, VC 投资行为不仅在于发现有投资价值的项目, 更侧重于通过提供增值服务, 提升项目价值。目前我国政府在政策支持上也是倾向将两者区别开来, 重点扶持 VC 事业的发展。此外, 他们利用的是被投资企业 IPO 当年的数据, 实际上考察的是 IPO 前的私募股权投资的影响。本研究关注的是其在被投资企业 IPO 后阶段的治理作用。

与非国有企业在高管薪酬方面面临着不同的制度环境。那么风险投资对不同产权性质企业的高管薪酬合约影响是否存在差异？

(3) 在法律等治理机制不够有效的情况下，声誉往往是一种有效的替代机制。那么在我国这样一个新兴市场经济的背景下，VC 的市场声誉等特征是否会对高管薪酬合约产生影响？

(4) VC 参与会使公司高管的额外薪酬水平表现出什么样的特征？

高管薪酬合约向来被视作一种重要的公司治理机制。通过将经理人的薪酬与企业绩效挂钩的契约机制，可在一定程度上约束经理人的懈怠和资源浪费行为 (Murphy, 1985; Jensen and Murphy, 1990)。薪酬-业绩敏感度 (PPS) 是衡量薪酬合约特征的重要维度，国内已有不少文献通过考察薪酬-业绩敏感度来分析影响公司高管薪酬合约的各种因素，如风险 (周嘉南、黄登仕, 2006)、高管权力 (方军雄, 2009; 谢德仁等, 2012)、内部控制 (卢锐等, 2011)、市场环境、政府干预等 (刘凤委等, 2007; 辛清泉, 2009)、私募投资者的参与 (王会娟、张然, 2012)。高管额外薪酬水平的高低及性质是衡量薪酬合约的另一个重要维度，权小锋等 (2010) 从高管权力的角度解释了高管额外薪酬水平的性质，吴联生等 (2010) 从薪酬外部公平性的激励效应角度分析了高管额外薪酬的业绩效应。但尚无文献从 VC 的角度，结合被投资企业产权特征，考察 VC 在被投资企业薪酬合约中的作用，以及在不同情境下作用的差异性。

本文以 2002 至 2011 年我国 A 股上市公司为样本对上述问题进行了研究。结果表明，风险投资显著提高了上市公司高管的薪酬-业绩敏感度。进一步研究发现，这种显著的增量作用主要表现在民营企业中；而且，相对于低声誉的风险投资，高声誉的风险投资对上市公司高管薪酬-业绩敏感度影响力更强。此外，研究还发现风险投资与被投资企业的正向额外薪酬水平显著正相关，进一步说明风险投资可能主要采取的是一种正向激励的机制。这些发现总体表明即使公司 IPO 以后，VC 仍然会在公司治理中发挥积极的作用，影响高管的薪酬合约。

本文的主要贡献在于：

(1) 拓展了目前国内外关于公司高管薪酬激励的文献，尤其是机构投资者影响高管薪酬合约的文献。Jay and Lurat (2003) 研究了公司前五大外部机构投资者所有权的集中度对高管薪酬合约的影响，王会娟、张然 (2012) 研究了私募投资对高管薪酬业绩敏感度影响。本文聚焦在更有动机与能力参与被投资企业治理的 VC，结合被投资企业的产权特征等制度背景，研究了 VC 对高管薪酬合约的影响。

(2) 丰富了 VC 声誉效应的文献。Krishnan *et al.* (2011)、Shu *et al.* (2011) 发现了 VC 声誉对被投资企业的长、短期绩效影响的经验证据。吴超鹏等 (2012) 提供了 VC 声誉对被投资企业融资约束影响的经验证据。本文则进一步发现 VC 声誉对被投资企业高管薪酬合约影响的证据。

(3) 为理解现有文献对 VC 作用的经验发现提供了进一步的洞见。吴超鹏等 (2012) 发现 VC 的存在可以抑制公司的过度投资。他们的逻辑是 VC 能够对被投资

企业的投资行为进行更有效的监督。我们的研究则从激励机制方面揭示了另一种影响途径：即 VC 通过建立更有效的薪酬激励机制，包括提高薪酬的业绩敏感度，增强薪酬的外部竞争力，从而引导高管的投资行为，缓解过度投资等代理问题。

(4) 我们为“高管额外薪酬水平”提供了另一种可能的解释。权小锋等(2010)从管理层权力的角度解释高管额外薪酬水平，我们发现在目前计量额外薪酬的方法下，所谓的“额外薪酬现象”也有可能是薪酬粘性与高强度激励机制同时存在的一个自然结果。

后文的安排如下：第二部分对 VC 影响上市公司高管薪酬合约的机制进行理论分析并提出假说。第三部分说明样本选择、数据来源及模型设定。第四部分是实证结果与分析。第五部分是稳健性测试。第六部分总结全文。

## 二、理论分析及假说的提出

### (一) 风险投资参与对公司高管薪酬 - 业绩敏感度的影响

Jensen and Murphy (1990) 认为激励性的薪酬合约是缓解经理人代理问题的重要机制。这种合约的基本要求是让经理人的薪酬与公司业绩联系起来。经理人的薪酬与企业业绩越敏感，他们的利益与股东的利益联系就越紧密。而具体的薪酬激励机制包括基于业绩的奖金计划、基本工资的调整、股票期权、解聘机制等。这些薪酬计划的实质就是通过增强经理人的薪酬 - 业绩敏感度，引导经理人做出与股东价值最大化目标一致的决策与行动。

然而，现实中企业高管的薪酬合约往往会受到经理人的操纵，使得薪酬合约的性质偏离最优的薪酬合约。薪酬计划不但没有成为缓解代理问题的有效机制，反而成为代理问题的表现之一。Bebchuk and Fried (2004) 发现经理人的权力大小与经理人的薪酬上升幅度紧密相关。他们认为，当董事会被 CEO 控制，就不存在董事会与高管之间独立平等的讨价还价或有效的协议，实际上，CEO 独裁了薪酬设定的程序。结果，CEO 的薪酬就经常独立于公司业绩。他们发现，CEO 的权力越大，CEO 的薪酬对企业业绩就更不敏感。

另一些研究表明，高管薪酬合约是否具有激励作用取决于公司治理好坏。Bertrand and Mullainathan (2001) 认为在治理差的公司中，经理人的薪酬实质上由其自己决定，在这种情况下，经理人会因为“好运”而获得奖赏。而在治理好的公司，这种情况并不明显。在治理好的公司中，股票期权作为替代其他形式的薪酬时，并不存在过度支付的情况。相反，治理不好的企业，股票期权似乎完全是额外补偿。Core *et al.* (1999) 发现公司董事会特征及所有权特征与 CEO 的薪酬水平存在显著联系。当 CEO 兼任董事会主席或外部董事由 CEO 任命时，CEO 的薪酬水平更高。Jay and Lurat (2003) 发现公司前五大外部机构投资者所有权的集中度与高管的薪酬 - 业绩敏感度正相关，与薪酬水平负相关。这个结果意味着外部机构投资者作为

一个整体可以缓解股东与经理的代理问题。

风险投资的参与会影响高管薪酬合约激励作用吗？我们认为风险投资的参与可以通过两个渠道来影响薪酬合约。一方面，风险投资作为一个积极的监督者通过参与被投资企业的公司治理来影响高管的薪酬合约。另一方面，风险投资直接影响薪酬合约。

风险投资对公司治理的积极作用有较多的文献支持。风险投资在企业的作用超过了传统金融中介机构的作用（Hellmann and Puri, 2002）。风险投资通过支持、咨询、监督三个方面来提升被投资企业的价值（Gompers, 2010），且这些作用主要通过影响董事会的特征来实现。Suchard（2009）发现那些有风险投资支持的上市公司董事会独立性会更强，表现在独立董事的人数及比例都更高，拥有更独立的具有产业经验的独立董事。Lerner（1995）发现澳大利亚的 VC 经理通过使用他们的网络来招募具有产业经验的专家独立董事来改进被投资企业的公司治理，特别是在被投资企业的 CEO 发生更替的时候。Fried *et al.*（1998）发现有风险投资支持的公司董事会对于公司战略的参与度要远高于其它公司。Baker and Gompers（2004）发现风险资本似乎是对 CEO 控制权的一种制衡：它不仅可以利用自身的所有权份额来稀释内部人所有权比例，降低 CEO 的控制权；而且有声誉的风险投资可以直接增加外部董事的比例来降低 CEO 的控制权。

关于风险投资作用的研究主要集中在被投资企业的 IPO 过程，也有少量研究关注被投资企业 IPO 后的决策。Baker and Gompers（2003）考察 1978 至 1987 年美国 IPO 市场发现风险资本支持的董事会有更少的内部人、更多的独立的外部董事。Campbell and Frye（2006）则考察了 IPO 之后风险投资背景公司的公司治理的变化，发现 IPO 后的年份 VC 支持的公司有更大的及更独立的董事会。

除了通过影响公司治理来约束经理人薪酬之外，风险投资影响高管薪酬—业绩敏感度的另一种渠道是直接参与企业薪酬契约的订立。薪酬合约是风险投资解决与创业企业合作问题的重要机制。Kaplan and Stromberg（2003）研究了风险投资的契约设定。他们系统地将风险投资家在投资过程中的代理问题分为四类，并提出了解决方案：

（1）创业者不去努力工作最大化公司价值，这个传统的道德风险问题（Holmstrom, 1979）可用创业者的薪酬补偿与公司业绩挂钩来解决；

（2）创业者对自己能力的了解比风险投资家要多，这个问题也可以用业绩挂钩的薪酬体系来解决（Lazear, 1986）；

（3）在投资之后，风险投资家与创业者之间可能会产生决策上的分歧，可通过将不同状态下的决策权在两者之间的分配来解决（Aghion and Bohon, 1992; Dewatripont and Tirole, 1994）；

（4）拥有非凡才华的创业者可能会以离职来威胁，“套牢”风险投资机构（Hart and Moore, 1994），股份兑现条款可以解决这个问题。

总的来说，契约内容取决于风险投资家与创业者之间的信息不对称程度。信息

不对称程度越高，创业者的薪酬补偿与业绩挂钩的越紧密，而且风险投资家就应该拥有更强的控制权、清算权和股份兑换安排的权利。<sup>4</sup>

VC 积极影响被投资企业公司治理的证据多来自风险投资事业比较成熟的西方发达国家。中国风险投资事业的发展还处于初步阶段：它是在政府直接参与及引导下发展起来的。1985 年 9 月，国务院批准成立了“中国新技术创业投资公司”，这是中国大陆第一家专营风险投资的全国性金融机构。随后很多地方政府纷纷成立了以孵化科技项目为目的的风险投资公司。同时，国内投资机会的日益增多吸引了不少外资风险投资机构的进入，也促进了本土民营风险投资机构的产生、发展。与发达国家相比，中国风险投资在投资行为上还存在一些较为明显的差异。尽管因风险投资的市场环境、制度环境的差异导致了现阶段中西风险投资行业之间的差异，不过，来自不同层面的证据显示，中国的风险投资机构也试图在提供资金之外，主动参与公司治理、提供其他增值服务。清科集团《2009 年中国创业投资机构增值服务研究报告》揭示了当前风险投资机构在具体增值服务项目上的资源分配依次主要是，战略规划支持、外部关系网络支持、后续融资支持、人力资源支持、精神鼓励与情感支持等。Bruton and Ahlstrom (2003) 面谈访问了中国大陆和香港的 24 家风险投资机构的 36 位风险投资家，发现这些 VC 要比他们的西方同行们花费更多的时间和精力监控企业。一些典型的风险投资案例也反映了风险投资机构无论投资处于初创期企业还是投资较为成熟的企业后，均不同程度地参与了公司内部的薪酬考核制度。如广东省风险投资集团 2003 年投资天波公司，成为该公司的第三大股东。其进入公司后，就提供了一系列的增值服务并建立及积极推行四大制度体系：绩效考核制度、薪酬管理制度、全面预算制度和股权激励制度。在投资鸿图公司后，也促使公司完善管理层的考评与激励机制和相关奖励制度（何国杰，2010）。除了上述相关调查与典型案例的证据外，经验研究证据也表明，目前我国上市公司中的风险投资机构对公司治理的改进发挥着积极的作用。张学勇、廖理（2011）发现风险投资会影响公司的治理结构安排，而且不同背景的风险投资对公司治理安排的影响存在差异。比如，他们发现，相对于那些非外资背景的风险投资，外资背景风险投资对公司治理有正面影响：外资风投背景和混合型风投支持的公司 IPO 之后，董事会规模较大，最大股东持股比例要更低；IPO 之后专业化董事比例更高。这表明，现阶段国内的风险投资投资机构除了发挥甄别风险投资项目的的作用外，也通过优化公司治理结构来直接提升企业价值。

综上，风险投资既可以通过改善公司治理进而影响高管的薪酬契约的制定，也

---

<sup>4</sup> 对于创业企业在 IPO 后，VC 直接影响高管薪酬合约的这一渠道是否还会继续发生作用，需要谨慎地考量 IPO 后，VC 与创业者等之间信息不对称程度以及 VC 动机、影响力等因素在 IPO 前后的变化。通常 IPO 后，VC 面临的信息环境有较大改善，VC 被“套牢”等风险大大降低。但是，在一些情况下，即使 IPO 后 VC 直接影响高管薪酬的条件仍然存在，比如 IPO 后 VC 面临着较长的锁定期等等。这可能会使 VC 有动机借助其影响力在 IPO 后直接影响高管薪酬合约，这一点也从国内创业板中一些 VC 背景的上市公司所实施的股票期权计划（如蓝色光标 2010 年的期权激励方案）中得到印证。

可以直接参与薪酬契约的制定过程。风险投资直接和间接的参与公司治理都会增加薪酬的激励作用。因此，我们提出以下假说：

**H1：在有风险投资支持的公司中，高管薪酬—业绩敏感度高于没有风险投资支持公司的高管薪酬—业绩敏感度。**

VC 对被投资企业公司治理的影响大小，可能会受到被投资企业具体情境因素的影响，其中最重要的因素就是被投资企业控股股东的性质。

不同产权性质上市公司的经理人薪酬决定机制存在显著差异。由于国有企业的经营具有多目标的性质，除了盈利目标外，社会、政治等非利润目标也是其重要的目标。此外，行业保护和政府控制也影响了市场力量塑造国有企业经理人薪酬契约的能力（辛清泉，2009）。与民营企业薪酬合约的市场化相比，国有企业的薪酬存在事实上的政府管制。比如，2009年9月16日，我国国务院六部委针对国有企业的高管薪酬联合出台了《关于进一步规范中央企业负责人薪酬管理的指导意见》，该限薪令对国有企业经理人的薪酬结构和薪酬水平进行了规范和限制。这种管制的薪酬本身折射出政府的社会目标，如社会公平、充分就业、财政赤字等（陈信元等，2009）。因此，很强的薪酬业绩敏感度可能并不是政府与国有企业经营者之间最优的薪酬合约。另一方面，正如 Shleifer and Vishny（1994）和 Cheng and Indjejikian（2009）指出，政府干预和社会舆论能够制约经理人的自利行为，因此减少了公司对代价高昂的薪酬激励方案的需求。显然，相对于民营企业，政府干预和社会舆论对国企产生的压力更大。

在这样的制度背景下，VC 投资民营企业与投资国有企业的动机可能存在较大的差异，这种差异造成 VC 参与两类公司治理的动机也不尽相同，进而 VC 对民营企业与国有企业的高管薪酬合约的影响也不同。相对于国企，民营企业高度的市场化运作机制，使得 VC 不单纯依靠选择好的民营项目而且也希望通过积极参与治理，提升企业的价值。而由于国有企业更容易受到行政干预，体现政府意志，其经营的目标也更多元化。VC 可能更多地通过被动地选择好的国企项目而不是通过改善国有企业的公司治理来获利。<sup>5</sup> 此外，国有企业的薪酬往往会受到政府主管部门的管制。可见，相比国有企业，VC 有更强的动机和能力影响民营企业的高管薪酬—业绩敏感度。因此，我们提出如下假说：

---

<sup>5</sup> 在我国背景下，VC 选择国企的动机主要有以下几点：（1）一些 VC 本身就是政府出资成立的，或者在政府引导基金的基础上设立起来的，这些 VC 在国企需要其投资入股时，自然就会迎合政府需要；（2）一些外资或民营的 VC 也需要借助地方政府等相关部门作为中介，寻求项目信息或者为其牵线搭桥。这一点，我们通过对地方科技部门或基层乡镇街道等商会的座谈得到印证。他们反映外地的 VC 常常会希望当地政府相关部门为其推荐项目。Bruton and Ahlstrom（2003）发现，中国的 VC 与地方政府和创业者建立良好的“关系网”是控制风险的必要和重要手段，有利于筛选好的项目和防止商业欺诈，通过“关系”能够影响创业者的行为，这也是中国和西方风险投资实践的重要差异。所以，基于与地方政府的一种交易，当政府需要他们作为风险投资带头参股国有企业时，VC 自然也会被动地选择部分国有企业。（3）即使从完全市场化投资决策来看，VC 也会选择一些投资前景好的国企项目。

H2: 相对于国有企业, 风险投资对民营企业的高管薪酬—业绩敏感度影响更大。

## (二) 风险投资的声誉对公司高管薪酬—业绩敏感度影响

大量的研究表明声誉对金融服务机构至关重要 (Holmstrom and Tirole, 1997; Titman and Trueman, 1986)。客观上, 不同声誉的 VC 在参与被投资公司治理方面的动机可能存在较为明显的差异。与低声誉 VC 相比, 高声誉的 VC 参与被投资企业的公司治理动机可能更强烈: 其一, 低声誉的 VC 往往有很强的逐名动机 (grandstanding) (陈工孟等, 2011)。由于急于在资本市场上建立声誉, 他们在 IPO 之后相对没有耐心参与被投资公司的治理。他们更倾向于选择好的项目, 然后更早地将其推向 IPO 市场。而高声誉 VC 逐名动机相对较弱, 保持声誉的动机更强, 因此, 他们不仅选择好的项目, 也有动机对项目进行更长时间的监控、支持。Nahata (2008) 发现高声誉的风险投资机构会花更多的时间去监督其投资的公司。Krishnan *et al.* (2011) 发现声誉越高的 VC 在 IPO 后更积极地参与被投资企业的公司治理 (比如在被投资企业 IPO 后继续保持股份的可能性更大, 在董事会的席位更多等), 进而对被投资公司 IPO 后的长期业绩产生了积极影响。其二, 高声誉 VC 项目管理的能力更强, 其积极参与被投资企业治理的边际成本相对更低、边际收益相对更高。此外, 风险投资机构的声誉实际上是其能力的外在表现, 也反映了风险投资与创业企业之间在合同签订中谈判能力的强弱。因此, 在其他方面相同的情况下, 有声誉的风险投资机构相比于没有声誉的风险投资机构, 其对被投资企业公司治理的改进作用会更大。Baker and Gompers (2004) 发现公司创立者继续担任 CEO 职位的可能性随着风险投资的声誉提高而降低。Gompers (2010) 发现风险投资机构的质量及退出影响一个企业治理结构。高质量 VC 的退出后, 相比于低质量 VC 的退出, 对高管的监控水平会下降更多。因此, 我们提出如下假说:

H3: 相对于低声誉风险投资支持的企业, 在高声誉风险投资支持的企业中, 高管薪酬—业绩敏感度更高。

## (三) 风险投资与公司高管的额外薪酬水平

进一步思考: 高管薪酬—业绩敏感度与薪酬水平之间是否相关? 存在怎样的相关关系? 给定风险投资能够提高公司高管的薪酬—业绩敏感度, 与同行业的其他公司相比, 风险投资背景公司的高管的相对薪酬水平又如何?

理论上讲, 当 VC 支持的公司业绩较差时, 较高的业绩敏感度可能使高管得到一种相对于行业的负向的额外薪酬水平。当业绩较好时, 较高的业绩敏感度又可能使高管得到相对于行业的正向额外薪酬水平。

不过, 现实中, 由于 VC 不同于一般企业的战略投资者, 它们希望被投资企业在短期内迅速提高业绩, 所以更有可能采取强度较大的正向激励, 以促进管理层努力工作, 提高业绩。当高管的经营业绩欠佳时, 由于薪酬具有“粘性”作用 (方军雄, 2009), VC 支持的公司常用的方法可能不是大幅度地降低高管薪酬, 而更可能



采取迅速“换人”的策略。因此，我们预期 VC 支持的公司高管有较高的正向额外薪酬水平，而负向额外薪酬差异并不明显。

同时，正如前面所述，VC 对国有企业与民营企业的薪酬业绩敏感度的影响存在差异，那么 VC 支持的民营企业与国有企业在高管的额外薪酬水平上也会存在差异。高管的正向额外薪酬水平可能主要体现在有 VC 支持的民营企业。因此，我们提出以下假说：

H4: 相对于无 VC 支持的企业，有 VC 支持的企业高管正向额外薪酬水平更高，且主要体现在民营企业中。

### 三、 样本选择及研究设计

#### (一) 样本选择

首先我们选取CSMAR数据库2002至2011年期间所有A股上市公司共16,190个公司一年度样本数据，然后依次剔除以下公司一年度样本：ST公司、当年上市的公司、金融行业样本、数据缺失的样本，最后获得7,812个公司一年度样本数据，涉及1,339家上市公司。

对于风险投资机构的识别，根据CSMAR数据库中公司前十大股东信息，首先根据股东的名称进行辨认，识别股东中是否存在风险投资者。如果股东名称中，含有“风险投资”或“创业投资”、“创新投资”等字眼，我们先将这些投资者初步认定为“风险投资机构”。然后，与清科私募通（Zdatabase）的相关数据库进行核对，确认这些风险投资机构同时也在该数据库中。如果不在Zdatabase的风投目录中，再从该公司招股说明书或公司网页、风险投资年鉴等资料中，进一步确认的这些风险投资机构是否实质上从事有关风险投资业务。按照上述界定标准，2002至2011年间上市公司十大股东中，共有152家风险投资机构，涉及728个公司一年度样本。为了更可靠地分析风险投资对上市公司高管薪酬契约的影响，我们进一步剔除在上市公司中位于第一大股东地位的风险投资机构，涉及43个公司一年度样本，剔除相关数据缺失的21个公司一年度样本，最后获得664个公司一年度样本，涉及146家风险投资机构以及247家公司（具体筛选过程见表1）。

表1 VC支持的公司一年度样本筛选过程

|  |      |
|--|------|
| 前十大股东名称中含有“风险投资”、“创业投资”、“创新投资”等字眼的股东样本 | 1590 |
| 剔除：                                    |      |
| 不在清科数据库且经识别不属于VC样本                     | 862  |
| 作为第一大股东的VC样本                           | 43   |
| 变量数据缺失                                 | 21   |
| 最终VC支持样本                               | 664  |

## (二) 模型设定及变量定义

### 1. VC 与高管薪酬业绩敏感度计量模型

为了检验假说 1 和假说 2, 本文借鉴国内外研究高管薪酬—业绩敏感度的模型 (Ke *et al.*, 2012; 辛清泉, 2009; 方军雄, 2009), 建立基本模型 (1), 在此模型的基础上, 加入 VC 哑变量以及 VC 哑变量与业绩变量的交乘项构建模型 (2)。

$$\begin{aligned} LNPAY_{i,t} = & \beta_0 + \beta_1 PERFORMANCE_{i,t} + CONTROL_{i,t} \\ & + \sum YEAR_t + \sum IND_j + \varepsilon_{i,t} \end{aligned} \quad (1)$$

$$\begin{aligned} LNPAY_{i,t} = & \beta_0 + \beta_1 PERFORMANCE_{i,t} + \beta_2 VC_{i,t} \\ & + \beta_3 VC_{i,t} \times PERFORMANCE_{i,t} + CONTROL_{i,t} \\ & + \sum YEAR_t + \sum IND_j + \varepsilon_{i,t} \end{aligned} \quad (2)$$

模型 (1) 中, 因变量  $LNPAY_{i,t}$  为高管薪酬的自然对数, 用收入最高的前三名董事的年度薪酬总额来衡量。在稳健性的检验中, 我们还分别用 CEO 的薪酬、收入最高的前三名高管人员的薪酬总额来衡量。自变量中,  $PERFORMANCE_{i,t}$  为净资产收益率 (ROE), 等于扣除非经常损益后的净利润与期末净资产之比。<sup>6</sup> 在稳健性检验中, 我们还用了总资产收益率 (ROA) 来衡量会计业绩。控制变量 ( $CONTROL_{i,t}$ ) 选取了公司年末总资产的自然对数 ( $SIZE$ )、年末净资产的市场价值与账面价值比 ( $TQ$ )、企业年末的资产负债率 ( $LEV$ )、第一大股东持股比例 ( $FRSHD$ )、一般机构投资者持股比例 ( $INSTI$ )、董事会规模 ( $BDS$ )、董事长与总经理两职兼任情况 ( $CBD$ )、独立董事比例 ( $OUTDIR$ )、是否为民营企业 ( $PRIV$ ) 等变量, 分别用来控制公司的规模、成长机会、债务杠杆、一般机构投资者、公司治理、企业性质等因素对高管薪酬合约的影响。变量  $YEAR_t$ 、 $IND_j$  则分别用来控制年度及行业效应。

模型 (2) 在模型 (1) 的基础上增加的两个变量分别是  $VC_{i,t}$ 、 $VC_{i,t} \times PERFORMANCE_{i,t}$ , 其中  $VC_{i,t}$  是哑变量, 第  $t$  年公司的第 2 到第 10 大股东中有风险投资机构则  $VC_{i,t}$  取值为 1, 否则为 0。我们关注的是交互项  $VC_{i,t} \times PERFORMANCE_{i,t}$  的系数  $\beta_3$  的正负方向及显著性。根据假说 1 和假说 2, 我们预期交乘项的系数为正且主要体现在民营企业样本中。

同时, 为了检验假说 3, 我们将风险投资分为高声誉和低声誉两组。VC 的声誉反映 VC 在风险投资市场中的影响力, 是 VC 的投资规模、管理能力、投资绩效的

<sup>6</sup> 公司业绩可以用会计回报或股票回报来计量。尽管股票回报对股东来说是相当重要的, 却不是对经理提供激励最好的方式 (Aggarwal and Jorion, 2010), 因为它容易受经理人无法控制的外部因素影响。相比股票回报, 会计回报对基薪与奖金有更多的影响 (Lambert and Larcker, 1987; Antle and Smith, 1986)。在国内, 由于国内股票市场的特殊性, 股票回报很难反映公司高管的业绩, 股票回报与高管薪酬的业绩敏感度很低 (权小锋等, 2010; 吴育辉等, 2010)。所以, 现有研究基本上采用会计业绩 (方军雄, 2009; 谢德仁等, 2012; 卢锐等, 2011)。而且, 国内股票期权等权益激励并不普遍。综上, 本文也仅采用利润指标来衡量公司业绩。

外在表现。我们以清科对中国创业投资年度评估排名为基准,<sup>7</sup>将风险投资机构排名作为衡量风险投资机构声誉大小的指标。具体地,以某风险投资机构是否进入前十名,划分高声誉风险投资机构与低声誉风险投资机构。凡进入前十名的VC认定为高声誉风险投资,否则认定为低声誉风险投资。检验假说3的模型为:

$$\begin{aligned} LNPAY_{i,t} = & \beta_0 + \beta_1 PERFORMANCE_{i,t} + \beta_2 REPUT_{i,t} \\ & + \beta_3 REPUT_{i,t} \times PERFORMANCE_{i,t} + CONTROL_{i,t} \\ & + \sum YEAR_t + \sum IND_j + \varepsilon_{i,t} \end{aligned} \quad (3)$$

$REPUT_{i,t}$ 是哑变量,如果在第 $t$ 年,参与公司的VC是高声誉的风险投资机构则取值1,否则取值0。我们关注的是交互项 $REPUT_{i,t} \times PERFORMANCE_{i,t}$ 系数 $\beta_3$ 的正负方向及显著性。根据假说3,我们预期 $\beta_3$ 显著为正。

## 2. VC与高管薪酬的额外薪酬水平计量模型

为了检验假说4,首先需要计算高管的额外薪酬。我们借鉴Core et al. (1999),吴联生等(2010)方法,采用如下管理层薪酬决定模型来计算高管的额外薪酬水平(UF):

$$\begin{aligned} LNPAY_t = & \beta_0 + \beta_1 SIZE_t + \beta_2 LEV_t + \beta_3 ROE_t + \beta_4 ROE_{t-1} \\ & + \beta_5 CBD_t + \beta_6 BDS_t + \beta_7 PRIV_t + \beta_8 TOPSHARE_t + \varepsilon \end{aligned} \quad (4)$$

在模型(4)中,其变量与模型(1)的相应变量定义相同。

对于每个公司管理层的正常薪酬,本文首先对模型(4)进行分年度分行业回归,再将所得到的估计系数代入模型(4),得到的残差 $\varepsilon$ 即为公司高管薪酬的额外薪酬水平(UF)。

计算出高管的额外水平后,我们借鉴权小锋等(2010)的模型,并根据本文的研究目的在该模型的基础上增加VC哑变量以及一般机构持股比例、民营企业哑变量等相关的控制变量,得到模型(5),用来检验假说(4)。

$$UF_{i,t} = \beta_0 + \beta_1 VC_{i,t} + CONTROL_{i,t} + \sum YEAR_t + \sum IND_j + \varepsilon_{i,t} \quad (5)$$

在模型(5)中,因变量是额外薪酬水平,自变量是VC哑变量,控制变量分别包括公司业绩类变量( $ROE$ 、 $RETURN$ )、公司特征类变量( $SIZE$ 、 $LEV$ 、 $GROWTH$ )、公司股权特征类变量( $FRSHD$ 、 $INSTI$ )、公司治理类变量( $CBD$ 、 $BDS$ 、 $OUTDIR$ )以及公司产权性质类哑变量( $PRIV$ )和地区收入水平( $EREAWAGE$ )等变量。此外,还控制了年度和行业。我们关注该模型中 $\beta_1$ 的正负方向及显著性。

<sup>7</sup> 由于该机构的年度排名从管理资本、募资、投资、退出及回报等多方面对中国境内开展创业投资及私募股权投资的机构进行全面考察,排名体系选择管理资本量,新募集基金个数及资本量,投资案例的个数及资本量,退出案例个数、退出金额和回报水平等作为重要的参考指标。

表 2 定义了模型 (1) 至 (5) 所涉及的变量及这些变量的具体含义。同时在回归统计分析中, 对模型中的控制变量进行了 1% 的 winsorize。

表 2 变量定义表

| 变量              | 变量定义   |
|-----------------|--|
| <i>LNPAY</i>    | 公司高管现金薪酬, 用收入最高的前三名董事的年度薪酬总额的对数来衡量               |
| <i>ROE</i>      | 扣除非经常损益后的净利润与期末净资产之比                             |
| <i>VC</i>       | VC 哑变量, 有 VC 参与的公司一年度, 取值 1, 否者取值 0              |
| <i>SIZE</i>     | 公司规模, 等于年末资产总额的自然对数                              |
| <i>LEV</i>      | 公司财务杠杆, 等于年末负债总额除以年末资产总额                         |
| <i>TQ</i>       | 年末公司净资产的市值/账面净值之比                                |
| <i>INSTI</i>    | 基金持股比例, 用基金年末持股比例衡量                              |
| <i>FRSHD</i>    | 第一大股东持股比例, 用年末持股比例衡量                             |
| <i>OUTDIR</i>   | 独立董事比例, 等于独立董事人数除以董事会人数                          |
| <i>CBD</i>      | 董事长与总经理是否两职合一, 两职合一取值 0, 两职分离取值 1                |
| <i>BDS</i>      | 董事会规模, 用董事会人数衡量                                  |
| <i>PRIV</i>     | 民营企业哑变量, 民营企业取值 1, 国有企业取值 0                      |
| <i>TOPSHARE</i> | 公司高管的年末持股比例                                      |
| <i>RETURN</i>   | 股票年回报率, 用考虑股利再投资的年投资收益率衡量                        |
| <i>GROWTH</i>   | 销售增长率  |
| <i>EREAWAGE</i> | 上市公司所在地区年人均工资水平                                  |
| <i>REPU</i>     | 风险投资机构声誉哑变量, 参与上市公司的 VC 是高声誉的风险投资机构则取值 1, 否则取值 0 |
| <i>YEAR</i>     | 年度变量   |
| <i>IND</i>      | 行业变量   |

#### 四、实证结果与分析

##### (一) VC 与高管薪酬业绩敏感性 (假说 1-3) 的描述性统计分析

###### 1. VC 在公司 IPO 后持股特征统计分析

表 3 列示了 VC 在上市公司持股比例及持股时间。VC 在上市公司平均持股约 4.65%, 中位数是 3.08%, 最大持股比例为 22.5%, 最小持股比例为 0.04%。在前十大股东中平均排名约第 5 位, 中位数为第 4 位。尽管第一大股东之外的风险投资机构的平均持股比例以及股东排名并不很靠前, 但是, VC 与一般的机构投资者有所

不同，它除了借助股权的力量，还可以借助其拥有的关系、网络资源、管理能力等在公司治理或契约订立中施加影响力。

值得说明的是，由于我们考察的是企业 IPO 之后，风险投资是否会影响企业高管薪酬合约，这就需要考虑上市前后风险投资的行为是否会发生实质性的变化。被投资企业上市后，有一些因素可能会导致风险投资的行为发生改变。一方面，被投资企业上市后，公司的监督机制更多了，有更多的机制可以依赖。另一方面，被投资企业上市后，风险投资机构的持股比例往往会被稀释，导致其监控成本与收益的对称性有所改变，“搭便车”的动机可能有所增强，积极监督的动机削弱。然而，我们发现，被投资企业上市后，保留在上市公司的风险投资，尽管其持股比例相对于被投资企业上市之前，持股比例有所下降，但是股东相对排名顺序没有发生实质性的变化（IPO 前风险投资在企业十大股东排名的中位数约为 4，IPO 后排名的中位数仍约为 4）。而且，在我国现阶段，上市后，企业可依赖的其他外部治理机制并不那么有效，因此，综合来看，IPO 之后，风险投资者的监督作用不会发生实质性的减弱。对于 VC 的持股时间，由表 3 可知，风险投资持股最长的 13 年，最短的 1 年，平均持股长度 3.41 年，中位数 2 年。这说明有相当一部分的 VC 在所投资企业 IPO 之后的较长时间内仍然持有股份。他们有较强的动机参与治理，提升公司价值。

表 3 VC 持股特征描述性统计

| 变量      | 平均值  | 中位数  | 标准差  | 最小值  | 最大值   | 观测值 |
|---------|------|------|------|------|-------|-----|
| 持股比例    | 4.65 | 3.08 | 4.46 | 0.04 | 22.50 | 664 |
| 前十大股东位数 | 4.77 | 4.00 | 2.33 | 2.00 | 10.00 | 664 |
| 持股时间    | 3.41 | 2.00 | 2.80 | 1.00 | 13.00 | 664 |

## 2. 主要变量的描述性统计分析

对全样本主要变量的描述性统计结果见表 4 Panel A，其中值得注意的是我国上市公司的高管持股平均比例偏低（表 4 中的 *TOPSHARE*），仅占 0.017%。这也从一个侧面表明我国公司高管薪酬结构中现金薪酬的主导地位，因而在我国研究公司高管现金薪酬—业绩敏感度更具针对性。

表 4 的 Panel B 对有风险投资支持与无风险投资支持样本的公司特征、业绩、高管薪酬等变量的均值及中位数进行比较，初步分析风险投资背景对高管薪酬合约的影响。从薪酬水平来看，风险投资支持公司的薪酬水平的平均数、中位数与无风险投资支持的公司没有显著差异。从会计业绩（*ROE*）来看，二者的均值、中位数均没有显著的差异。这表明，VC 的投资对公司高管薪酬绝对水平影响不大，VC 支持公司的业绩也并不一定好于无 VC 支持的公司。有 VC 支持公司的资产负债率低于没有 VC 支持公司的资产负债率。有 VC 支持的公司的资产规模低于没有 VC 支持的资产规模，有 VC 支持公司的 TQ 高于无 VC 支持公司，说明 VC 更倾向投资

成长性较高、规模相对较小的公司。此外，两者在第一大股东持股比例、一般机构投资者持股比例等股东特征上也存在一些差异。可见，风险投资的公司与无风险投资的公司在公司特征、股东特征上存在一些系统差异。回归分析中，我们会对这些特征进行控制。

表 4 主要变量的描述性统计

| Panel A 全样本变量描述性统计 |      |        |        |        |        |        |
|--------------------|------|--------|--------|--------|--------|--------|
| 变量                 | 观测数  | 均值     | 中位数    | 标准差    | 最小值    | 最大值    |
| <i>LNPAY</i>       | 7812 | 13.643 | 13.684 | 0.835  | 10.736 | 15.433 |
| <i>VC</i>          | 7812 | 0.085  | 0      | 0.279  | 0      | 1      |
| <i>ROE</i>         | 7812 | 0.063  | 0.076  | 0.169  | -1.225 | 0.374  |
| <i>SIZE</i>        | 7812 | 21.698 | 21.609 | 1.105  | 18.671 | 24.911 |
| <i>LEV</i>         | 7812 | 0.481  | 0.499  | 0.185  | 0.008  | 0.994  |
| <i>TQ</i>          | 7812 | 1.665  | 1.245  | 1.158  | 0.549  | 21.896 |
| <i>INSTI</i>       | 7812 | 5.283  | 1.567  | 8.118  | 0.000  | 66.196 |
| <i>FRSHD</i>       | 7812 | 38.876 | 37.890 | 16.123 | 3.690  | 86.420 |
| <i>OUTDIR</i>      | 7812 | 0.354  | 0.333  | 0.052  | 0.000  | 0.800  |
| <i>BDS</i>         | 7812 | 9.494  | 9.000  | 1.966  | 5.000  | 15.000 |
| <i>CBD</i>         | 7812 | 0.869  | 1      | 0.337  | 0      | 1      |
| <i>PRIV</i>        | 7812 | 0.455  | 0      | 0.498  | 0      | 1      |
| <i>TOPSHARE</i>    | 7812 | 0.017  | 0.000  | 0.067  | 0.000  | 0.754  |

  

| Panel B 有 VC 支持与无 VC 支持公司对比 |        |        |             |        |        |             |
|-----------------------------|--------|--------|-------------|--------|--------|-------------|
| 变量                          | 均值     |        |             | 中位数    |        |             |
|                             | 无 VC   | VC     | 差异          | 无 VC   | VC     | 差异          |
| <i>LNPAY</i>                | 13.640 | 13.686 | (-0.046)    | 13.680 | 13.839 | (-0.159)    |
| <i>ROE</i>                  | 0.062  | 0.071  | (-0.009)    | 0.076  | 0.076  | (0.000)     |
| <i>SIZE</i>                 | 21.756 | 21.073 | (0.683)***  | 21.630 | 20.925 | (0.705)***  |
| <i>LEV</i>                  | 0.491  | 0.377  | (0.114)***  | 0.503  | 0.362  | (0.141)***  |
| <i>TQ</i>                   | 1.639  | 1.947  | (-0.308)*** | 1.236  | 1.788  | (-0.552)*** |
| <i>INSTI</i>                | 5.354  | 4.526  | (0.828)**   | 1.530  | 2.439  | (-0.909)*   |
| <i>FRSHD</i>                | 39.385 | 33.386 | (5.999)***  | 38.110 | 32.710 | (5.400)***  |
| <i>OUTDIR</i>               | 0.353  | 0.357  | (-0.004)    | 0.333  | 0.333  | (0.000)     |
| <i>BDS</i>                  | 9.516  | 9.266  | (0.250)**   | 9.000  | 9.000  | 0           |
| <i>CBD</i>                  | 0.882  | 0.733  | (0.149)***  | 1      | 1      | 0           |
| <i>PRIV</i>                 | 0.429  | 0.742  | (-0.313)*** | 0      | 1      | (-1)***     |
| <i>TOPSHARE</i>             | 0.010  | 0.089  | (-0.079)*** | 0.000  | 0.000  | 0           |
| N                           | 7148   | 664    |             | 7148   | 664    |             |

注：均值差异显著性检验为双侧 T 检验，中位数差异显著性检验为 Wilcoxon 秩和检验，\*、\*\*、\*\*\*分别表示显著性水平为 10%、5%、1%。

### 3. 主要变量相关性分析

主要变量的相关性分析见表 5，该表右上方是 Pearson 相关系数，左下方是 Spearman 相关系数。从相关系数来看，值得注意的是高管薪酬的自然对数与 *ROE*、*TQ* 以及 *SIZE*、*INSTI*、*FRSHD*、*OUTDIR*、*BDS*、*CBD*、*PRIV* 等控制变量均显著相关，说明在回归分析中对这些变量进行控制的必要性。

此外，*INSTI* 与 *LNPAY* 的相关性相对较高（相关系数 0.4240），不过，*VC* 与 *INSTI* 相关性系数较低，且不显著（两相关系数分别为 -0.008、0.017），而且 *INSTI* 与 *SIZE* 显著正相关，而 *VC* 与 *SIZE* 负相关，这反映风险投资与一般机构投资者在投资对象的选择上还是存在较大差异，说明将 *VC* 与一般机构投资者区别出来进行研究是有必要的。同时，也意味着，如果在后面的计量分析中发现了风险投资显著影响高管薪酬合约的现象，我们也不必担心这种影响是一般机构投资者作用的结果。整体来看，自变量、控制变量之间的相关系数较小，因此，根据该模型进行的回归分析不会带来严重的多重共线性问题。

#### （二）VC 与高管薪酬业绩敏感性（假说 1-3）的回归分析

##### 1. VC 支持、公司特征与高管薪酬—业绩敏感度

表 6 分析了 *VC* 对被投资企业高管薪酬—业绩敏感度影响。从基本回归（1）来看，*ROE* 的系数显著为正，显著性水平为 1%。加入 *VC* 相关的变量后的回归结果（2）显示，*ROE* 系数依然显著为正，交乘项 *VC\*ROE* 的系数显著为正，显著性水平为 5%，这说明从会计业绩来看，*VC* 支持公司的高管薪酬业绩敏感度系数显著高于没有 *VC* 支持的公司。其他控制变量 *TQ*、*LEV*、*SIZE* 的系数在各回归模型中的显著性及正负方向也与已有研究的发现一致（Ke *et al.*, 2012；方军雄，2009 等）。综上所述，*VC* 的存在提高了被投资企业的高管薪酬—业绩敏感度。假说 1 得到验证。

假说 2 预期 *VC* 对国有企业与民营企业的高管薪酬—业绩敏感度的影响存在差异。为了验证假说 2，我们根据被投资企业的最终控制人的产权性质，将被投资企业分为国有企业（即最终控制人的产权为国有）与民营企业（即最终控制人的产权为个人）两个子样本，继而考察在不同类别的企业中，*VC* 支持对高管薪酬—业绩敏感度是否有差异。表 7 的回归结果显示，在民营企业中，*VC* 与 *ROE* 交乘项的系数显著为正，显著性水平为 1%。在国有企业中，*VC* 与 *ROE* 的交乘项的系数并不显著异于零。为了进一步检验两者差异的显著性，我们在同一模型中检验两者系数的差异。回归结果显示（表 7 回归（3））：交乘项 *PRIV\*VC\*ROE* 的系数显著为正，显著性水平为 1%，进一步说明相对于国有企业，*VC* 对民营企业高管薪酬—业绩敏感度影响更大，这与假说 2 预期一致。

##### 2. VC 特征与高管薪酬—业绩敏感度

从 *VC* 的角度看，*VC* 的实力不同，对被投资企业决策的参与度及与被投资企业讨价还价的能力也不同。从被投资企业的角度看，除了资金需求外，引入不同声

表 5 主要变量的相关性分析

| 变量     | LNPAY     | VC        | ROE       | SIZE      | LEV       | TQ        | INSTI    | FRSHD     | OUTDIR    | CBD       | BDS       | PRIV      |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|
| LNPAY  | 1         | 0.015     | 0.297***  | 0.405***  | 0.016     | 0.183***  | 0.326*** | -0.049*** | 0.109***  | -0.039*** | 0.070***  | 0.112***  |
| VC     | 0.018*    | 1         | 0.001     | -0.070*** | -0.077*** | 0.037***  | -0.008   | -0.055*** | 0.015     | -0.054*** | -0.010    | 0.067***  |
| ROE    | 0.415***  | 0.003     | 1         | 0.174***  | -0.206*** | 0.144***  | 0.277*** | 0.105***  | 0.017     | -0.006**  | 0.029***  | 0.018     |
| SIZE   | 0.399***  | -0.072*** | 0.235***  | 1         | 0.338***  | -0.195*** | 0.195*** | 0.241***  | 0.065***  | 0.107***  | 0.229***  | -0.142*** |
| LEV    | 0.018     | -0.076*** | -0.075*** | 0.349***  | 1         | -0.253*** | -0.019*  | -0.015    | 0.032***  | 0.079***  | 0.065***  | -0.042*** |
| TQ     | 0.270***  | 0.067***  | 0.320***  | -0.191*** | -0.260*** | 1         | 0.340*** | -0.161*** | 0.072***  | -0.073*** | -0.108*** | 0.249***  |
| INSTI  | 0.424***  | 0.017     | 0.529***  | 0.331***  | -0.047*** | 0.453***  | 1        | -0.095*** | 0.020*    | -0.018*   | 0.015     | 0.054***  |
| FRSHD  | -0.036**  | -0.053*** | 0.132***  | 0.213***  | -0.021*   | -0.185*** | -0.007   | 1         | -0.016    | 0.069***  | 0.038***  | -0.291*** |
| OUTDIR | 0.110***  | 0.008     | 0.021*    | 0.066***  | 0.043**   | 0.091***  | 0.067*** | -0.034*** | 1         | -0.045*** | -0.243*** | 0.094***  |
| CBD    | -0.038*** | -0.054*** | -0.021*   | 0.106***  | 0.078***  | -0.094*** | -0.024** | 0.065***  | -0.044*** | 1         | 0.105***  | -0.130*** |
| BDS    | 0.057***  | -0.006    | 0.012     | 0.202***  | 0.065***  | -0.117*** | 0.030**  | 0.025**   | -0.184*** | 0.114***  | 1         | -0.187*** |
| PRIV   | 0.106***  | 0.067***  | 0.073***  | -0.138*** | -0.043*** | 0.298***  | 0.088*** | -0.295*** | 0.068***  | -0.130*** | -0.193*** | 1         |

注：表 5 的右上方为 Pearson 相关系数，左下方为 Spearman 相关系数。\*、\*\*、\*\*\* 分别表示显著性水平为 10%、5%、1%。



誉的 VC 的目的也存在差异。引入高声誉的 VC，可以更多地导入 VC 的管理经验，提升企业自身的治理。因此，我们预期 VC 声誉对高管薪酬—业绩敏感度有显著正的影响。

表 6 VC 支持与高管薪酬—业绩敏感度

| <i>LNPAY</i>       | (1)                  | (2)                             |
|--------------------|----------------------|---------------------------------|
| <i>VC</i>          |                      | -0.055<br>(-1.15)               |
| <i>ROE</i>         | 0.733***<br>(15.60)  | 0.720***<br>(15.20)             |
| <i>VC*ROE</i>      |                      | <b>0.710**</b><br><b>(2.21)</b> |
| <i>SIZE</i>        | 0.277***<br>(29.43)  | 0.277***<br>(29.38)             |
| <i>LEV</i>         | -0.258***<br>(-5.44) | -0.260***<br>(-5.48)            |
| <i>TQ</i>          | 0.033***<br>(3.95)   | 0.033***<br>(3.91)              |
| <i>FRSHD</i>       | -0.003***<br>(-6.50) | -0.003***<br>(-6.53)            |
| <i>INSTI</i>       | 0.011***<br>(10.94)  | 0.011***<br>(10.94)             |
| <i>BDS</i>         | 0.024***<br>(6.12)   | 0.024***<br>(6.13)              |
| <i>CBD</i>         | -0.09***<br>(-4.45)  | -0.09***<br>(-4.39)             |
| <i>OUTDIR</i>      | 0.508***<br>(3.42)   | 0.507***<br>(3.41)              |
| <i>PRIV</i>        | 0.046***<br>(2.71)   | 0.046***<br>(2.71)              |
| Constant           | 6.754***<br>(31.98)  | 6.766***<br>(31.92)             |
| <i>YEAR、IND</i>    | 已控制                  | 已控制                             |
| N                  | 7812                 | 7812                            |
| Adj_R <sup>2</sup> | 0.434                | 0.436                           |

注：\*、\*\*、\*\*\*依次表示 10%、5%、1%的显著性水平，下表同。

表 7 企业的产权性质、VC 与高管薪酬—业绩敏感度

| <i>LNPAY</i>             | ( 1 ) 民营企业组                | ( 2 ) 国有企业组               | ( 3 ) 全样本                  |
|--------------------------|----------------------------|---------------------------|----------------------------|
| <i>VC</i>                | -0.138**<br>(-2.11)        | -0.026<br>(-0.33)         | -0.014<br>(-0.17)          |
| <i>ROE</i>               | 0.566***<br>(8.62)         | 0.885***<br>(12.76)       | 0.866***<br>(12.89)        |
| <i>VC*ROE</i>            | <b>1.710***<br/>(3.42)</b> | <b>-0.233<br/>(-0.55)</b> | <b>-0.152<br/>(-0.35)</b>  |
| <i>PRIV*ROE</i>          |                            |                           | 0.265***<br>(3.07)         |
| <i>PRIV*VC</i>           |                            |                           | -0.122<br>(-1.19)          |
| <i>PRIV*VC*ROE</i>       |                            |                           | <b>1.912***<br/>(2.93)</b> |
| <i>SIZE</i>              | 0.299***<br>(20.30)        | 0.273***<br>(21.92)       | 0.277***<br>(29.39)        |
| <i>LEV</i>               | -0.308***<br>(-4.32)       | -0.208***<br>(-3.22)      | -0.261***<br>(-5.50)       |
| <i>TQ</i>                | 0.032***<br>(3.17)         | 0.060***<br>(3.58)        | 0.033***<br>(3.95)         |
| <i>FRSHD</i>             | -0.002***<br>(-3.27)       | -0.003***<br>(-5.79)      | -0.003***<br>(-6.59)       |
| <i>INSTI</i>             | 0.010***<br>(6.65)         | 0.010***<br>(7.38)        | 0.011***<br>(10.78)        |
| <i>BDS</i>               | 0.029***<br>(4.37)         | 0.022***<br>(4.35)        | 0.025***<br>(6.21)         |
| <i>CBD</i>               | -0.143***<br>(-4.91)       | -0.035<br>(-1.03)         | -0.097***<br>(-4.45)       |
| <i>OUTDIR</i>            | 0.566**<br>(2.50)          | 0.400**<br>(2.01)         | 0.493***<br>(3.32)         |
| <i>PRIV</i>              |                            |                           | 0.060***<br>(3.42)         |
| Constant                 | 7.010***<br>(21.83)        | 6.924***<br>(23.97)       | 6.703***<br>(31.44)        |
| <i>YEAR</i> 、 <i>IND</i> | 已控制                        | 已控制                       | 已控制                        |
| N                        | 3558                       | 4254                      | 7812                       |
| Adj_R <sup>2</sup>       | 0.411                      | 0.456                     | 0.435                      |

注：\*、\*\*、\*\*\*依次表示 10%、5%、1%的显著性水平。

表 8 分组回归结果显示, 在按声誉分组的情况下,  $ROE$  在两组中的回归系数都在 1%的水平上显著为正, 且高声誉组为 5.888, 高于低声誉组的 1.696。在全样本回归中, 高声誉 VC 的哑变量  $REPU$  与  $ROE$  的交乘项显著为正, 显著性水平为 10%, 说明高声誉的 VC 对被投资企业的高管薪酬合约的影响力显著更强, 提高了高管薪酬—业绩的薪酬敏感度, 与假说 3 的预期一致。

表 8 VC 声誉与高管薪酬—业绩敏感度

| <i>LNPAY</i>       | (1)                  | (2)                 | (3)                            |
|--------------------|----------------------|---------------------|--------------------------------|
|                    | 低声誉 VC 组             | 高声誉 VC 组            | 全样本                            |
| <i>ROE</i>         | 1.696***<br>(6.30)   | 5.888***<br>(3.42)  | 1.787***<br>(6.71)             |
| <i>REPU</i>        |                      |                     | -0.149<br>(-0.94)              |
| <i>REPU*ROE</i>    |                      |                     | <b>2.573*</b><br><b>(1.81)</b> |
| <i>SIZE</i>        | 0.141***<br>(3.42)   | -0.231<br>(-1.29)   | 0.118***<br>(2.98)             |
| <i>LEV</i>         | -0.197<br>(-1.01)    | 0.417<br>(0.40)     | -0.230<br>(-1.22)              |
| <i>TQ</i>          | 0.0528<br>(1.24)     | -0.186<br>(-1.57)   | 0.0108<br>(0.28)               |
| <i>FRSHD</i>       | -0.007***<br>(-2.74) | -0.013<br>(-1.24)   | -0.008***<br>(-3.59)           |
| <i>INSTI</i>       | 0.011**<br>(2.19)    | 0.025<br>(1.03)     | 0.013***<br>(2.64)             |
| <i>BDS</i>         | 0.013<br>(0.67)      | 0.168<br>(1.45)     | 0.020<br>(1.09)                |
| <i>CBD</i>         | -0.281***<br>(-3.37) | -0.554**<br>(-2.38) | -0.277***<br>(-3.63)           |
| <i>OUTDIR</i>      | 2.302***<br>(3.17)   | 1.844<br>(0.53)     | 2.100***<br>(3.02)             |
| <i>PRIV</i>        | 0.001<br>(0.02)      | 0.252<br>(0.87)     | 0.024<br>(0.35)                |
| Constant           | 9.981<br>(10.67)     | 17.236<br>(3.92)    | 9.940<br>(11.27)               |
| <i>YEAR、IND</i>    | 已控制                  | 已控制                 | 已控制                            |
| Adj_R <sup>2</sup> | 0.397                | 0.311               | 0.385                          |
| N                  | 517                  | 147                 | 664                            |

注: \*\*、\*、\*\*\*依次表示 10%、5%、1%的显著性水平。

(三) VC 支持与高管的额外薪酬水平 (假说 4)

1. 描述性统计分析及相关性分析 (假说 4)

表 9 Panel A 是模型 (5) 主要变量的描述性统计分析 (为了简洁, 对于前文分析中已经涉及到的相关变量的统计分析在此不再重复列示)。值得注意的是, 从额外薪酬的最大值、最小值、中位数之间的间距来看, 上市公司之间额外薪酬水平也存在较大差异。

表 9 Panel B 显示, 有 VC 支持的公司的额外薪酬的平均值显著高于没有 VC 支持的公司 (前者的平均值为 0.051, 后者的平均值为 -0.043)。两者在总体薪酬水平上没有明显差异。这说明很可能是由于 VC 支持的较高的薪酬—业绩敏感度导致 VC 支持的公司的高管具有较高的额外薪酬水平。

表 9 主要变量的描述性统计分析

| Panel A          |      |          |          |          |          |          |
|------------------|------|----------|----------|----------|----------|----------|
| 变量               | 观测数* | 均值       | 中位数      | 标准差      | 最小值      | 最大值      |
| <i>UF</i>        | 7219 | -0.039   | -0.008   | 0.728    | -3.425   | 2.986    |
| <i>RETURN</i>    | 7219 | 0.495    | 0.162    | 1.070    | -0.909   | 16.119   |
| <i>GROWTH</i>    | 7219 | 0.410    | 0.170    | 6.035    | -0.999   | 400.677  |
| <i>EREA WAGE</i> | 7219 | 28224.41 | 26404.00 | 12621.88 | 10397.00 | 66115.00 |

  

| Panel B: VC 支持公司与无 VC 支持公司对比 |        |        |            |        |        |          |
|------------------------------|--------|--------|------------|--------|--------|----------|
|                              | 均值     |        |            | 中位数    |        |          |
|                              | 无 VC   | 有 VC   | 差异         | 无 VC   | 有 VC   | 差异       |
| <i>UF</i>                    | -0.043 | 0.051  | (-0.094)** | -0.009 | 0.043  | (-0.052) |
| <i>LNPAY</i>                 | 13.638 | 13.666 | (-0.028)   | 13.685 | 13.848 | (-0.163) |
| N                            | 6604   | 615    |            | 6604   | 615    |          |

\*这里观测数较表 4 中的样本数小的原因是增加了新变量, 导致数据缺失数的增加。

\*\*表示 5% 的显著性水平。

对主要变量的相关性分析的结果也发现 (为了简洁, 变量间的相关性系数没有在文中报告): 首先, *VC* 与 *UF* 正相关, 初步说明 *VC* 参与和高管的额外薪酬水平相关。其次, 各变量的相关系数相对较小, 说明将这些变量纳入同一模型进行回归分析, 不会产生严重的多重共线性问题。

2. VC 与高管额外薪酬水平回归分析 (假说 4)

表 10 Panel A 是根据模型 (5) 进行回归分析的结果。回归 (1) 和 (2) 表明, 在基本模型中加入 *VC* 哑变量后, 用全部样本进行回归时, 基本模型的其他变量系数的正负性质与显著性保持稳定, 但 *VC* 变量的系数并没有显著异于 0。当将 *UF* 按

正负分组后分别进行回归，在正的额外薪酬样本组，*VC* 的系数显著为正，显著性水平为 5%。在负的额外薪酬样本组，*VC* 的系数为负，但不显著。这说明 *VC* 实施高强度的正向激励后，与同行业其他公司比较来看，表现出较高的正向额外薪酬水平，支持假说 4。

值得指出的是，为了进一步验证，这种较高的正向额外薪酬水平是来自高强度的正向激励，我们还进一步检验了，在被投资企业不同的相对业绩水平下（与同行业比较而言），*VC* 实施的激励策略是否存在差异。我们将每个公司在各年度的业绩水平（*ROE*）与该公司当年所属行业的业绩中位数进行比较，如果高于或等于行业中位数，划分为高业绩组，否则，划为低业绩组。分组检验的结果见表 10 Panel B，该表显示在高业绩组，*VC\*ROE* 显著，显著性水平为 10%。将两个子样本组放入同一模型进行检验，*HIGH\*VC\*ROE* 的系数显著（业绩高于行业中位数，*HIGH* 取值 1，否则取值 0），显著性水平为 1%，进一步说明 *VC* 实施高强度的正向激励是导致 *VC* 支持的公司表现较高的正向额外薪酬水平的主要原因。

表 10 *VC* 支持和高管额外薪酬水平

| Panel A         | 因变量: <i>UF</i> |              |                 |                 |
|-----------------|----------------|--------------|-----------------|-----------------|
|                 | (1)<br>全样本     | (2)<br>全样本   | (3)<br>正向额外薪酬样本 | (4)<br>负向额外薪酬样本 |
| <i>VC</i>       |                | <b>0.005</b> | <b>0.081**</b>  | <b>-0.035</b>   |
|                 |                | (0.15)       | (2.53)          | (-0.90)         |
| <i>ROE</i>      | 1.055***       | 1.054***     | 0.366***        | 0.530***        |
|                 | (8.29)         | (8.29)       | (3.45)          | (3.82)          |
| <i>RETURN</i>   | 0.019*         | 0.019*       | 0.033***        | 0.003           |
|                 | (1.75)         | (1.75)       | (3.45)          | (0.30)          |
| <i>SIZE</i>     | -0.320***      | -0.320***    | -0.123***       | -0.142***       |
|                 | (-35.69)       | (-35.67)     | (-13.95)        | (-15.07)        |
| <i>LEV</i>      | -0.029***      | -0.029***    | -0.018***       | -0.007***       |
|                 | (-11.63)       | (11.63)      | (-6.00)         | (-3.65)         |
| <i>GROWTH</i>   | -0.000         | -0.000       | -0.000          | 0.000           |
|                 | (-0.74)        | (-0.74)      | (-0.05)         | (0.08)          |
| <i>EREAWAGE</i> | 0.000***       | 0.000***     | 0.000***        | 0.000***        |
|                 | (15.02)        | (15.02)      | (4.83)          | (6.79)          |
| <i>INSTI</i>    | 0.008***       | 0.008***     | 0.003***        | 0.003***        |
|                 | (7.86)         | (7.86)       | (4.08)          | (3.50)          |
| <i>PRIV</i>     | -0.131***      | -0.131***    | -0.042***       | -0.032*         |
|                 | (-7.52)        | (-7.52)      | (-2.77)         | (-1.79)         |
| <i>CBD</i>      | 0.116***       | 0.116***     | 0.001           | 0.083***        |
|                 | (4.99)         | (4.99)       | (0.06)          | (3.60)          |
| <i>BDS</i>      | 0.002          | 0.002        | -0.001          | 0.003           |
|                 | (0.49)         | (0.49)       | (-0.47)         | (0.77)          |
| <i>OUTDIR</i>   | 0.387**        | 0.387**      | 0.294**         | 0.086           |
|                 | (2.50)         | (2.50)       | (2.11)          | (0.57)          |

|                          |                      |                      |                     |                      |
|--------------------------|----------------------|----------------------|---------------------|----------------------|
| <i>FRSHD</i>             | -0.004***<br>(-8.83) | -0.004***<br>(-8.82) | -0.001**<br>(-2.52) | -0.002***<br>(-4.09) |
| Constant                 | 6.350***<br>(30.89)  | 6.349***<br>(30.87)  | 2.993***<br>(14.54) | 2.296***<br>(11.00)  |
| <i>YEAR</i> 、 <i>IND</i> | 已控制                  | 已控制                  | 已控制                 | 已控制                  |
| N                        | 7219                 | 7219                 | 3584                | 3635                 |
| Adj_R <sup>2</sup>       | 0.266                | 0.266                | 0.105               | 0.169                |

Panel B VC支持与正向激励

|                          | 因变量 <i>LNPAY</i>       |                         |                           |
|--------------------------|------------------------|-------------------------|---------------------------|
|                          | (1)<br>低业绩组            | (2)<br>高业绩组             | (3)<br>全样本                |
| <i>VC</i>                | 0.095<br>(1.63)        | 0.206<br>(1.14)         | 0.159**<br>(2.89)         |
| <i>ROE</i>               | 0.285***<br>(4.99)     | 1.514***<br>(8.55)      | 0.718***<br>(15.16)       |
| <i>VC*ROE</i>            | <b>0.417</b><br>(1.14) | <b>2.332*</b><br>(1.77) | <b>0.039</b><br>(0.11)    |
| <i>HIGH*VC*ROE</i>       |                        |                         | <b>2.567***</b><br>(3.83) |
| <i>SIZE</i>              | 0.250***<br>(17.51)    | 0.286***<br>(23.20)     | 0.277***<br>(29.43)       |
| <i>LEV</i>               | -0.234***<br>(-3.48)   | -0.549***<br>(-8.04)    | -0.270***<br>(-5.69)      |
| <i>TQ</i>                | 0.024**<br>(2.01)      | -0.003<br>(-0.33)       | -0.003***<br>(3.64)       |
| <i>FRSHD</i>             | -0.003***<br>(-4.71)   | -0.005***<br>(-7.60)    | -0.003***<br>(-6.66)      |
| <i>INSTI</i>             | 0.007***<br>(3.36)     | 0.006***<br>(5.24)      | 0.011***<br>(10.88)       |
| <i>CBD</i>               | -0.057*<br>(-1.85)     | -0.121***<br>(-4.12)    | -0.093***<br>(-4.30)      |
| <i>BDS</i>               | 0.027***<br>(4.79)     | 0.023***<br>(4.18)      | 0.024***<br>(6.09)        |
| <i>OUTDIR</i>            | 0.557**<br>(2.76)      | 0.392*<br>(1.86)        | 0.494***<br>(3.33)        |
| <i>PRIV</i>              | 0.044*<br>(1.84)       | -0.018<br>(-0.78)       | 0.046**<br>(2.71)         |
| Constant                 | 6.784***<br>(21.68)    | 6.722***<br>(24.33)     | 6.483***<br>(30.94)       |
| <i>YEAR</i> 、 <i>IND</i> | 已控制                    | 已控制                     | 已控制                       |
| N                        | 3900                   | 3912                    | 7812                      |
| Adj_R <sup>2</sup>       | 0.426                  | 0.425                   | 0.435                     |

注：\*、\*\*、\*\*\*依次表示10%、5%、1%的显著性水平。

## 3. VC、产权性质与高管额外薪酬水平（假说4）

进一步考察 VC 在产权性质不同的两类企业中，对额外薪酬水平的影响是否存在差异。结果见表 11。对正向额外薪酬样本组进一步按照国有与民营企业分组回归，结果显示，在民营企业的样本组，VC 的系数显著为正，显著性水平为 1%，而在国有企业的样本组，VC 的系数并没有显著异于零。同样，对负的额外薪酬样本组进一步细分为民营企业与国有企业两个样本组，并进行分组回归，结果显示，无论在民营还是国有样本组，VC 的系数均不显著。以上结果说明相对于国有企业，VC 对民营企业高管激励强度更大，导致 VC 支持的民营企业的高管有着较高的正向额外薪酬，也与假说 4 的预测一致。

表 11 VC、产权性质与高管额外薪酬水平

|                    | 民营企业                      |                          | 国有企业                   |                          |
|--------------------|---------------------------|--------------------------|------------------------|--------------------------|
|                    | 正向额外薪酬                    | 负向额外薪酬                   | 正向额外薪酬                 | 负向额外薪酬                   |
| <i>VC</i>          | <b>0.143***</b><br>(3.15) | <b>-0.005</b><br>(-0.10) | <b>0.020</b><br>(0.42) | <b>-0.094</b><br>(-1.60) |
| <i>ROE</i>         | 0.120<br>(0.77)           | 0.583***<br>(2.71)       | 0.623***<br>(3.96)     | 0.634***<br>(3.40)       |
| <i>RETURN</i>      | 0.038***<br>(2.71)        | -0.000<br>-0.04          | 0.026**<br>(2.02)      | 0.015<br>(0.94)          |
| <i>SIZE</i>        | -0.088***<br>(-6.31)      | -0.155***<br>(-10.76)    | -0.153***<br>(-12.81)  | -0.138***<br>(-10.78)    |
| <i>LEV</i>         | -0.020***<br>(-2.85)      | -0.012***<br>(-3.81)     | -0.018***<br>(-5.47)   | -0.003<br>(-1.26)        |
| <i>GROWTH</i>      | 0.000<br>(0.14)           | -0.000<br>(-0.05)        | -0.002<br>(-0.19)      | 0.001<br>(0.28)          |
| <i>EREA WAGE</i>   | 0.000*<br>(1.93)          | 0.000***<br>(3.64)       | 0.000***<br>(5.21)     | 0.000***<br>(5.73)       |
| <i>INSTI</i>       | 0.003**<br>(2.53)         | 0.005***<br>(3.27)       | 0.004***<br>(3.39)     | 0.001<br>(1.23)          |
| <i>CBD</i>         | -0.014<br>(-0.49)         | 0.078**<br>(2.45)        | 0.016<br>(0.54)        | 0.103***<br>(2.95)       |
| <i>BDS</i>         | 0.006<br>(1.04)           | 0.007<br>(1.18)          | -0.009**<br>(-1.99)    | -0.001<br>(-0.37)        |
| <i>OUTDIR</i>      | 0.285<br>(1.29)           | 0.127<br>(0.54)          | 0.251<br>(1.35)        | 0.071<br>(0.35)          |
| <i>FRSHD</i>       | -0.001*<br>(-1.72)        | -0.001<br>(-1.50)        | -0.001**<br>(-2.52)    | -0.002***<br>(-3.85)     |
| Constant           | 2.073***<br>(6.18)        | 2.449***<br>(7.46)       | 3.815***<br>(13.87)    | 2.301***<br>(8.13)       |
| <i>YEAR、IND</i>    | 已控制                       | 已控制                      | 已控制                    | 已控制                      |
| N                  | 1609                      | 1616                     | 1975                   | 2019                     |
| Adj R <sup>2</sup> | 0.180                     | 0.142                    | 0.149                  | 0.209                    |

注：\*、\*\*、\*\*\*依次表示 10%、5%、1%的显著性水平。

## 五、 稳健性检验

为了验证上述结果的稳健性，我们进行了如下检验：

### （一）薪酬水平取值

我们分别用 CEO 的薪酬和收入最高的前三位高管薪酬作为薪酬的替代变量，对上述模型重新进行回归，各回归结果的系数与显著性没有发生实质性变化。也分别用 ROA 和扣除非经常性损益前经营性的 ROE 等作为会计业绩的替代变量，重新对以上模型进行回归，各回归结果的系数与显著性也没有发生实质性变化，说明我们的研究结果具有较强的稳健性。

### （二）内生性检验

本文的研究发现可能存在一个内生性问题，即我们看到的结果是否是由于 VC 选择了那些本来就具有相对更高薪酬—业绩敏感度或高管额外薪酬水平更高的公司来投资，而不是由于其积极参与治理带来的效应。为了检验这种可能存在的内生性问题，我们通过以下两种方法来解决。首先，我们采用倾向评分配对方法（Propensity Score Matching，简称 PSM），通过该方法构造对照组来解决内生性问题（Rosenbaum and Rubin, 1983; Armstrong *et al.*, 2010）。这种方法先估算每一家公司被 VC 选择的 propensity score（简称 PS），然后为每一家有 VC 支持的公司寻找一家无 VC 参与公司作为对照样本，要求两者的 PS 最接近。

我们借鉴王会娟、张然（2012）的做法，根据以下模型（6）<sup>8</sup> 的回归分析结果预测出来所有公司吸引 VC 的 PS，然后为每一个有 VC 支持的公司找到 PS 最接近的一个无 VC 投资的企业进行配对。回归分析发现，<sup>9</sup> 现金、公司年龄以及第一大股东的持股比例，以及公司所在地区与 VC 参与的概率显著相关（CASH、AGE、FRSHD、LOCAL 等系数显著异于零），说明年轻的企业、第一大股东持股比例较低的、东部地区等更容易吸引到 VC。这样我们为 247 家有 VC 支持的公司找到对应的配对样本。

$$VC = \beta_0 + \beta_1 BV + \beta_2 PROFIT + \beta_3 QRATIO + \beta_4 OCYCLE + \beta_5 CASH + \beta_6 LEV + \beta_7 SIZE + \beta_8 AGE + \beta_9 PRIV + \beta_{10} FRSHD + \beta_{11} LOCAL + \varepsilon \quad (6)$$

将配对样本组的公司一年度数据按照模型（1）、（2）进行薪酬—业绩敏感度回归分析，结果（见表 12 Panel A）与表 6、表 7 结果基本一致，说明表 6、表 7 的结果是稳健的。

<sup>8</sup> 该模型中变量定义如下：BV 是公司权益账面价值除以总资产，PROFIT 是营运利润率，用营业利润除以营运资产衡量，QRATIO 是速动比率；OCYCLE 是营运周期，用存货周转率加上应收账款周转率后取自然对数。CASH 是总资产标准化的现金和现金等价物；AGE 是公司的年龄，从成立到目前的年数；LOCAL 为虚拟变量，当公司注册地点位于北京、上海、广东、江苏和浙江五省份则取 1，否则取 0，其他变量定义见表 2。

<sup>9</sup> 为了简洁，具体的回归结果在文中没有报告，如有需要向作者索取。



表 12 稳健性检验 — 利用 PSM 方法

| Panel A: VC 支持与高管薪酬—业绩敏感度 |                           |                           |                          |                           |                          |                        |                        |
|---------------------------|---------------------------|---------------------------|--------------------------|---------------------------|--------------------------|------------------------|------------------------|
|                           | 全样本                       | 民营企业                      | 国有企业                     | 全样本                       |                          |                        |                        |
| <i>VC</i>                 | -0.018<br>(-0.38)         | -0.149*<br>(-1.90)        | 0.065<br>(1.03)          | 0.064<br>(1.00)           |                          |                        |                        |
| <i>ROE</i>                | 0.899***<br>(8.71)        | 0.933***<br>(6.47)        | 0.867***<br>(5.67)       | 0.827***<br>(5.44)        |                          |                        |                        |
| <b><i>VC*ROE</i></b>      | <b>1.057***</b><br>(2.98) | <b>2.397***</b><br>(4.14) | <b>0.176</b><br>(0.39)   | <b>0.181</b><br>(0.39)    |                          |                        |                        |
| <i>PRIV*ROE</i>           |                           |                           |                          | 0.128<br>(0.66)           |                          |                        |                        |
| <i>PRIV*VC</i>            |                           |                           |                          | -0.194**<br>(-1.97)       |                          |                        |                        |
| <b><i>PRIV*VC*ROE</i></b> |                           |                           |                          | <b>2.256***</b><br>(3.13) |                          |                        |                        |
| <i>INSTI</i>              | 0.011***<br>(5.37)        | 0.012***<br>(3.48)        | 0.012***<br>(4.21)       | 0.011***<br>(5.29)        |                          |                        |                        |
| <i>PRIV</i>               | 0.013<br>(0.42)           |                           |                          | -0.018<br>(-0.49)         |                          |                        |                        |
| N                         | 2334                      | 1247                      | 1087                     | 2334                      |                          |                        |                        |
| Adj_R <sup>2</sup>        | 0.405                     | 0.415                     | 0.356                    | 0.408                     |                          |                        |                        |
| Panel B: VC 支持与高管额外薪酬水平   |                           |                           |                          |                           |                          |                        |                        |
|                           | (1)                       | (2)                       | (3)                      | (4)                       | (5)                      | (6)                    | (7)                    |
|                           | 全样本                       | 正向<br>额外薪酬                | 正向额外薪酬                   |                           | 负向<br>额外薪酬               | 负向额外薪酬                 |                        |
|                           |                           |                           | 民营<br>企业                 | 国有<br>企业                  |                          | 民营<br>企业               | 国有<br>企业               |
| <i>VC</i>                 | <b>-0.009</b><br>(-0.14)  | <b>0.076</b><br>(1.28)    | <b>0.187**</b><br>(2.45) | <b>-0.150</b><br>(-1.42)  | <b>-0.109</b><br>(-1.33) | <b>0.006</b><br>(0.06) | <b>-0.206</b><br>-1.49 |
| <i>INSTI</i>              | 0.009***<br>(2.96)        | 0.008***<br>(3.19)        | 0.007**<br>(2.36)        | 0.008**<br>(2.05)         | 0.003<br>(0.83)          | 0.008*<br>(1.68)       | -0.009<br>(-1.06)      |
| N                         | 1960                      | 1054                      | 513                      | 541                       | 960                      | 473                    | 433                    |
| Adj_R <sup>2</sup>        | 0.331                     | 0.293                     | 0.296                    | 0.245                     | 0.258                    | 0.228                  | 0.251                  |

\*为了简洁,大部分控制变量在表 12 中没有报告,只报告了对本文结论可能产生影响的个别控制变量的系数。各控制变量的回归系数是稳健的,表 13 也做相同处理。\*、\*\*、\*\*\*依次表示 10%、5%、1%的显著性水平。

表 13 稳健性检验—利用工具变量法

| Panel A VC 支持与高管薪酬—业绩敏感度 |                                 |                               |                                  |                                 |                                 |                                 |                                 |
|--------------------------|---------------------------------|-------------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
|                          | 全样本                             | 民营企业                          | 国有企业                             | 全样本                             |                                 |                                 |                                 |
| <i>VC</i>                | -0.012<br>(-0.21)               | -0.073<br>(-0.94)             | 0.017<br>(0.18)                  | 0.007<br>(0.08)                 |                                 |                                 |                                 |
| <i>ROE</i>               | 0.728***<br>(14.69)             | 0.596***<br>(8.65)            | 0.842***<br>(11.79)              | 0.834***<br>(11.96)             |                                 |                                 |                                 |
| <i>VC*ROE</i>            | <b>0.882**</b><br>(2.56)        | <b>1.769***</b><br>(3.31)     | <b>-0.046</b><br>(-0.10)         | <b>0.051</b><br>(0.11)          |                                 |                                 |                                 |
| <i>PRIV*ROE</i>          |                                 |                               |                                  | -0.195**<br>(-2.16)             |                                 |                                 |                                 |
| <i>PRIV*VC</i>           |                                 |                               |                                  | -0.089<br>(-0.75)               |                                 |                                 |                                 |
| <i>PRIV*VC*ROE</i>       |                                 |                               |                                  | <b>1.841***</b><br>(2.63)       |                                 |                                 |                                 |
| <i>INSTI</i>             | 0.014***<br>(11.61)             | 0.012***<br>(7.37)            | 0.011***<br>(7.80)               | 0.013***<br>(11.49)             |                                 |                                 |                                 |
| <i>PRIV</i>              | 0.062***<br>(3.54)              |                               |                                  | 0.073***<br>(3.98)              |                                 |                                 |                                 |
| <i>IMR</i>               | 0.008<br>(0.23)                 | -0.037<br>(-0.68)             | 0.041<br>(0.92)                  | 0.008<br>(0.24)                 |                                 |                                 |                                 |
| N                        | 7812                            | 3558                          | 4254                             | 7812                            |                                 |                                 |                                 |
| Adj_R <sup>2</sup>       | 0.396                           | 0.376                         | 0.413                            | 0.397                           |                                 |                                 |                                 |
| Panel B VC 支持与高管额外薪酬水平   |                                 |                               |                                  |                                 |                                 |                                 |                                 |
|                          | 全样本                             | 正向<br>额外薪酬                    | 正向<br>额外薪酬                       | 负向<br>额外薪酬                      | 负向<br>额外薪酬                      | 民营<br>企业                        | 国有<br>企业                        |
| <i>VC</i>                | <b>-0.028</b><br><b>(-0.40)</b> | <b>0.081</b><br><b>(1.35)</b> | <b>0.218***</b><br><b>(2.66)</b> | <b>-0.128</b><br><b>(-1.18)</b> | <b>-0.130</b><br><b>(-1.60)</b> | <b>-0.015</b><br><b>(-0.14)</b> | <b>-0.213</b><br><b>(-1.59)</b> |
| <i>IMR</i>               | -1.172<br>(-0.82)               | 0.878<br>(0.72)               | 2.601<br>(1.45)                  | -1.826<br>(-0.86)               | -6.618***<br>(-3.97)            | -3.999<br>(-1.63)               | -8.517***<br>(-3.50)            |
| <i>INSTI</i>             | 0.009***<br>(2.67)              | 0.008***<br>(3.16)            | 0.006<br>(1.97)                  | 0.010**<br>(2.34)               | 0.002<br>(0.45)                 | 0.008<br>(1.52)                 | -0.011<br>(-1.27)               |
| N                        | 7219                            | 3583                          | 1608                             | 1975                            | 3635                            | 1616                            | 2019                            |
| Adj_R <sup>2</sup>       | 0.317                           | 0.289                         | 0.256                            | 0.263                           | 0.297                           | 0.217                           | 0.242                           |

注：\*、\*\*、\*\*\*依次表示 10%、5%、1%的显著性水平。

同样利用配对样本组数据,重新根据模型(5)进行回归分析,结果(见表 12 Panel B)与表 10、表 11 的回归分析结果基本一致。只是可能由于样本量的减少,列(2)中的 VC 系数不够显著,基本表明表 10、表 11 的结果是稳健的。

其次,我们借鉴吴超鹏等(2012)的方法,以企业所在地 VC 的密度、以及企业是否在 1998 年后上市,<sup>10</sup> 作为 VC 的工具变量(通常企业所在地 VC 密度,企业是否在 1998 年后上市与一个公司是否被 VC 投资直接相关,但与公司的薪酬业绩敏感度以及高管的额外薪酬水平并没有直接相关性),采用 Heckman(1979)的两阶段模型来解决内生性问题。首先,采用 Probit 模型,利用工具变量估计公司选择 VC 投资时的 Inverse Mill's Ratio (*IMR*)。然后,在模型(2)、(5)中加入 *IMR* 后,进行回归分析。表 13 的 Panel A、Panel B 分别报告了 Heckman 工具变量法第二阶段回归分析的结果。两个表的结果也分别与表 6、表 7 以及表 10、表 11 结果基本一致,说明实证结果具有较强的稳健性。

## 六、 结论

风险投资行业在我国快速成长。在新兴与转型的市场经济背景下,风险投资在我国上市公司中是否发挥了正面的治理作用成为被广泛关注的话题。我们从上市公司高管薪酬合约的角度,结合上市公司产权特征,就风险投资机构对上市公司高管薪酬—业绩敏感度、额外薪酬水平的影响进行了理论分析并提出了相关假说,并利用 2002 至 2011 年 A 股数据,进行了实证检验。

我们发现整体上,风险投资的参与显著提高了被投资企业高管的薪酬—业绩敏感度,提高了高管的正向额外薪酬水平。在此基础上,我们进一步分析了上市公司控股股东的产权性质对 VC 作用力的影响。结果发现,风险投资能够显著提高民营企业高管薪酬—业绩敏感度以及正向的额外薪酬水平,对国有企业高管薪酬—业绩敏感度以及正向额外薪酬水平的提高,作用并不显著。从 VC 特征看,VC 声誉大小也会影响被投资企业高管薪酬—业绩敏感度:相对于低声誉的风险投资,高声誉的风险投资对上市公司高管薪酬—业绩敏感度影响力更强。最后,结合本文的研究结果,我们发现风险投资支持的企业其高管薪酬—业绩敏感度是造成这些企业较高额外薪酬的原因之一。

这些结论意味着促进风险投资事业的发展,不仅可以缓解企业融资约束的问题,更能通过风险投资积极参与公司治理的正面作用,促进我国企业公司治理水平的提升及健康发展。同时也意味着,政府的支持 VC 发展的时候,也需要深化国有企业的改革,这样才能为 VC 积极发挥治理作用提供必要的制度条件。此外,我们

---

<sup>10</sup> “上市公司是否在 1998 年以后上市”的工具变量,刻画的是 1998 年政协“一号提案”(《关于加快发展我国风险投资事业的几点意见》)政策出台后,VC 才开始迅速发展的这一政策效应,因此,在 1998 年以后公开上市的公司更可能吸引到风险投资。

的研究结论对于创业企业选择、吸引有声誉的风险投资机构达到提升公司治理水平的目的也有借鉴意义。

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

## 参考文献

- 陈工孟、俞欣、寇祥河，2011，“风险投资参与对中资企业首次公开发行折价的影响”，《经济研究》第5期：74-85。
- 陈信元、陈冬华、万华林、梁上坤，2009，“地区差异、薪酬管制与高管腐败”，《管理世界》第11期：130-143。
- 方军雄，2009，“我国上市公司的高管薪酬存在粘性吗”，《经济研究》第3期：110-123。
- 何国杰，2010年，《本土风险投资实务——广东省风险投资集团投资案例精选》，中山大学出版社。
- 刘凤委、孙铮、李增泉，2007，“政府干预、行业竞争与薪酬契约：来自国有上市公司的经验证据”，《管理世界》第9期：76-84。
- 卢锐、柳建华、许宁，2011，“内部控制、产权与高管薪酬业绩敏感度”，《会计研究》第10期：42-48。
- 权小锋、吴世农、文芳，2010，“管理层权力、私有收益与薪酬操纵”，《经济研究》第11期：73-87。
- 王会娟、张然，2012，“私募股权投资与被投资企业高管薪酬契约——基于公司治理视角的研究”，《管理世界》第9期：156-167。
- 吴超鹏、吴世农、程静雅、王璐，2012，“风险投资对上市公司投融资行为影响的实证研究”，《经济研究》第1期：105-119。
- 吴联生、林景艺、王亚平，2010，“薪酬外部公平性、股权性质与公司业绩”，《管理世界》第3期：117-126。
- 吴育辉、吴世农，2010，“高管薪酬：激励还是自利？——来自中国上市公司的证据”，《会计研究》第11期：40-48。
- 谢德仁、林乐、陈运森，2012，“薪酬委员会独立性与更高的经理人报酬—业绩敏感度”，《管理世界》第1期：121-140。
- 辛清泉，2009，“市场化改革、企业业绩与国有企业经理薪酬”，《经济研究》第11期：68-81。
- 辛清泉、林斌、王彦超，2007，“政府控制、经理薪酬与资本投资”，《经济研究》第8期：110-122。

- 张学勇、廖理, 2011, “风险投资背景与公司 IPO: 市场表现与内在机理”, 《经济研究》第 6 期: 118-132。
- 周嘉南、黄登仕, 2006, “上市公司高级管理层薪酬业绩敏感度与风险之间关系的实证检验”, 《会计研究》第 4 期: 44-50。
- Aghion, P. K. and Bohon, P. (1992), ‘An Imcomplete Contracts Approach to Financial Contracting’, *Review of Economic Studies* 59 (3): 473-494.
- Aggarwal, R. K. and Jorion, P. (2010), ‘The Performance of Emerging Hedge Funds and Managers’, *Journal of Financial Economics* 96 (2): 238-256.
- Aggarwal, R. K. and Samwick, A. (2006), ‘Empire-Builders and Shirkers: Investment, Firm Performance, and Managerial Incentives’, *Journal of Corporate Finance* 12 (3): 489-515.
- Antle, R. and Smith, A. (1986), ‘An Empirical Investigation of the Relative Performance Evaluation of Corporate Executives’, *Journal of Accounting Research* 24 (1): 1-39.
- Armstrong, C., Jagolinzer, A., and Larcker, D. (2010), ‘Chief Executive Officer Equity Incentives and Accounting Irregularities’, *Journal of Accounting Research* 48 (2): 225-271.
- Baker, M. and Gompers, P. A. (2003), ‘The Determinants of Board Structure and Function in Entrepreneurial Firms’, *Journal of Law and Economics* 46 (2): 569-598.
- Baker, M. and Gompers, P. A. (2004), ‘An Analysis of Executive Compensation, Ownership, and Control in Entrepreneurial Firms’, Working Paper, Harvard University.
- Barry, C. B., Muscarella, C. J., Peavy III, J. W., and Vetsuypens, M. R. (1990), ‘The Role of Venture Capital in the Creation of Public Companies: Evidence from the Going Public Process’, *Journal of Financial Economics* 27 (2): 447-471.
- Bebchuk, L. and Fried, J. (2004), *Pay without Performance*, Cambridge: Harvard University Press.
- Bertrand, M. and Mullainathan, S. (2001), ‘Are CEOs Rewarded for Luck? The Ones without Principals Are’, *Quarterly Journal of Economics* 116 (3): 901-932.
- Bruton, G. D. and Ahlstrom, D. (2003), ‘An Institutional View of China’s Venture Capital Industry Explaining the Differences between China and the West’, *Journal of Business Venturing* 18 (2): 233-259.
- Campbell III, T. L. and Frye, M. B. (2006), ‘Venture Capitalist Involvement and the Long-run Performance of IPOs’, *The Journal of Private equity* 10 (1): 7-17.
- Cheng, S. J. and Indjejikian, R. J. (2009), ‘The Market for Corporate Control and CEO Compensation: Complements or Substitutes?’, *Contemporary Accounting Research* 26 (3): 701-728.

- Core, J., Holthausen, R., and Larcker, D. (1999), 'Corporate Governance, Chief Executive Officer Compensation, and Firm Performance', *Journal of Financial Economics* 51 (3): 371-406.
- Cyr, L. A., Johnson, D. E., and Welbourne, T. M. (2000), 'Human Resources in Initial Public Offering Firms: Do Venture Capitalists Make a Difference', *Entrepreneurship: Theory and Practice* 25 (1): 77-91.
- Davila, A. and Foster, G. (2005), 'Management Accounting Systems Adoption Decisions: Evidence and Performance Implications from Early-Stage/Startup Companies', *The Accounting Review* 80 (4): 1039-1068.
- Dewatripont, M. and Tirole, J. (1994), 'A Theory of Debt and Equity: Diversity of Securities and Manager-Shareholder Congruence', *The Quarterly Journal of Economics* 109 (4): 1027-1054.
- Fried, V. H., Bruton, G. D., and Hisrich, R. D. (1998), 'Strategy and the Board of Directors in Venture Capital-backed Firms', *Journal of Business Venturing* 13 (6): 493-503.
- Gompers, P. (1995), 'Optimal Investment, Monitoring, and the Staging of Venture Capital', *Journal of Finance* 50 (5): 1461-1489.
- Gompers, P. (2010), 'Venture Capital', in Eckbo, B. E., *Handbook of Corporate Finance: Empirical Corporate Finance*, Amsterdam: North-holland Press, pp. 481-507.
- Hart, O. and Moore, J. (1994), 'A Theory of Debt Based on the Inalienability of Human Capital', *The Quarterly Journal of Economics* 109 (4): 841-879.
- Heckman, J. (1979), 'Sample Selection Bias as a Specification Error', *Econometrica* 47 (1): 153-161.
- Hellmann, T. and Puri, M. (2002), 'Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence', *The Journal of Finance* 57 (1): 169-197.
- Holmstrom, B. and Tirole, J. (1997), 'Financial Intermediation, Loanable Funds and the Real Sector', *The Quarterly Journal of Economics* 112 (3): 663-691.
- Holmstrom, B. (1979), 'Moral Hazard and Observability', *The Bell Journal of Economics* 10 (1): 74-91.
- Jay, C. H. and Lurat, S. (2003), 'Institutional Investors and Executive Compensation', *The Journal of Finance* 58 (6): 2351-2374.
- Jensen, M. C. and Murphy, K. J. (1990), 'Performance Pay and Top Management Incentives', *Journal of Political Economy* 98 (2): 225-264.
- Kaplan, S. and Stromberg, P. (2003), 'Financial Contracting Theory Meets the Real World: Evidence from Venture Capital Contracts', *Review of Economic Studies* 70 (2): 281-315.
- Kang, S., Kumar, P., and Lee, H. (2006), 'Agency and Corporate Investment: The Role

- of Executive Compensation and Corporate Governance', *Journal of Business* 79 (3): 1127-1147.
- Ke, B., Rui, O., and Yu, W. (2012), 'Hong Kong Stock Listing and the Sensitivity of Managerial Compensation to Firm Performance in State-Controlled Chinese Firms', *Review of Accounting Study* 17 (1): 166-188.
- Kortum, S. and Lerner, J. (2000), 'Assessing the Impact of Venture Capital on Innovation', *Rand Journal of Economics* 31 (4): 674-692.
- Krishnan, C. N. V., Ivanov, V. I., Masulis, R.W., and Singh, A. K. (2011), 'Venture Capital Reputation, Post-IPO Performance, and Corporate Governance', *Journal of Financial and Quantitative Analysis* 46 (5): 1295-1333.
- Lambert, R. and Larcker, D. (1987), 'An Analysis of the Use of Accounting and Market Measures of Performance in Executive Compensation Contracts', *Journal of Accounting Research* 25 (Supplement): 85-125.
- Lazear, E. P. (1986), 'Salaries and Piece Rates', *Journal of Business* 59 (3): 405-431.
- Lerner, J. (1995), 'Venture Capitalists and the Oversight of Private firms', *The Journal of Finance* 50 (1): 301-318.
- Lerner, J. (1999), 'The Government as Venture Capitalist: The Long-Run Impact of the SBIR Program', *Journal of Business* 72 (3): 285-318.
- Murphy, K. (1985), 'Corporate Performance and Managerial Remuneration: An Empirical Analysis', *Journal of Accounting and Economics* 7 (1-3): 11-42.
- Nahata, R. (2008), 'Venture Capital Reputation and Investment Performance', *Journal of Financial Economics* 90 (2): 127-151.
- Rosenbaum, P. and Rubin, D. (1983), 'The Central Role of the Propensity Score in Observational Studies for Causal Effects', *Biometrika* 70 (1): 41-55.
- Ryan, H. and Wiggins, R. (2002), 'The Interactions between R&D Investment Decisions and Compensation Policy', *Financial Management* 31(1): 5-29.
- Shleifer, A. and Vishny, R. W. (1994), 'Politicians and Firms', *The Quarterly Journal of Economics* 109 (4): 995-1025.
- Shu, P. G., Yin, H. Y., Chiu, S. B., and Ho, F. S. (2011), 'The Reputation Effect of Venture Capital', *Review of Quantitative Finance and Accounting* 36 (4): 533-554.
- Suchard, J. A. (2009), 'The Impact of Venture Capital Backing on the Corporate Governance of Australian Initial Public Offerings', *Journal of Banking and Finance* 33 (4): 765-774.
- Titman, S. and Trueman, B. (1986), 'Information Quality and the Valuation of New Issues', *Journal of Accounting and Economics* 8 (2): 159-172.
- Wang, C. K., Wang, K., and Lu, Q. (2003), 'Effects of Venture Capitalists Participation in Listed Companies', *Journal of Banking and Finance* 27 (10): 2015-2034.

# Venture Capital, Property Rights, and Managerial Compensation Contracts<sup>1</sup>

Shuang Xue and Fengshou Tang<sup>2</sup>

Received 10<sup>th</sup> of April 2013   Accepted 6<sup>th</sup> of September 2013

© The Author(s) 2013. This article is published with open access by The Hong Kong Polytechnic University

## Abstract

This paper investigates the impact of venture capital on managers' compensation contracts. The results show that pay-performance sensitivity (PPS) is higher in venture-capital-backed companies than in non-venture-capital-backed companies. A higher PPS may bring managers of venture-capital-backed companies a higher extra emolument compared with that offered by other companies in the same industry. A further test shows that the positive effect of venture capital on PPS and extra emolument exists in (1) private enterprises rather than state-owned enterprises (SOEs) and (2) in firms backed by highly reputable venture capitalists (VCs) rather than in firms backed by VCs with a low reputation. The findings indicate that even after initial public offerings (IPOs), venture capital still has a positive impact on corporate governance and affects managerial compensation contracts.

**Keywords:** Venture Capital, Pay-Performance Sensitivity, Extra Emolument, Compensation Contract

**CLC Codes:** F276.6, F275, F830.5

---

<sup>1</sup> This research is funded by a National Natural Science Grant (Grant No: 71172143), a Key Social Science Research Institute Grant of the Ministry of Education (Grant No.: 12JJD790037), and the Program for New Century Excellent Talents in University (NCET-13-0893).

<sup>2</sup> Shuang Xue, School of Accountancy, Institute of Accounting and Finance, Shanghai University of Finance and Economics. Postal Code: 200433. Email: xuesh@mail.shufe.edu.cn. Fengshou Tang, School of Accountancy, Shanghai University of Finance and Economics; Zhejiang Wanli University. Email: tang\_fsh@163.com.



## I. Introduction

It is widely believed that the success of the venture capital industry is an important factor for innovation and economic growth. Both theoretical and empirical evidence from developed countries show that venture capitalists (VCs) are active investors (Barry *et al.*, 1990; Gompers, 1995; Lerner, 1999; Kortum and Lerner, 2000). Compared with other financial intermediaries, VCs can not only provide capital to investees but can also make use of their management experience and social networks to play an active role in investees' corporate governance and management in areas such as corporate strategy, capital structure arrangement, and human resource allocation (Fried *et al.*, 1998; Cyr *et al.*, 2000; Wang *et al.*, 2003; Davila and Foster, 2005).

In recent years, although the Chinese government has been encouraging the development of venture capitalism, there is little empirical evidence about VCs' role in investees' corporate governance and decision-making. Comparing the market performance of newly listed companies backed by VCs with that of companies not backed by VCs, Zhang and Liao (2011) find that foreign VCs are more prudent in project selection and that the corporate governance structure of their investees is more efficient. By comparing the underpricing of initial public offerings (IPOs) of Chinese firms in different capital market contexts, Chen *et al.* (2011) find that VCs in the mainland capital market have a stronger "grandstanding" motivation. So far, there have been few studies focusing on VCs' role in the post-IPO stage. The question of whether VCs still play an active role in the post-IPO stage has yet to be answered.<sup>3</sup>

Wu *et al.* (2012) investigate how VCs affect investees' investing and financing in the post-IPO stage and find that VCs can mitigate not only investees' overinvestment of free cash flow but also the problem of underinvestment due to a shortage of cash flow. Their paper is, to the best of our knowledge, the first to explore VCs' role in the post-IPO stage. What then is the channel through which VCs can affect their investees' investment policies? Since executive compensation contracts are an important mechanism through which a company's investment policy can be influenced (Ryan and Wiggins, 2002; Aggarwal and Samwick, 2006; Kang *et al.*, 2006; Xin *et al.*, 2007), can VCs guide investees' investment policy through the compensation arrangement for executives? This

---

<sup>3</sup> Wang and Zhang (2012) investigate the impact of private equity on an investee's executive compensation contracts. In their paper, they do not distinguish venture capital from general private equity (PE). In fact, the difference between venture capital and general PE not only exists in the concept but also in the motivation for investing and the endowment of resources. Compared to PE investors, VC investors not only screen valuable projects in which to invest but also focus on providing more value-added services to investees. The current policies of the Chinese Government also tend to distinguish VC from PE and to give more support to VC investors. In addition, Wang and Zhang (2012) focus on the impact of PE on investees during the pre-IPO stage. In contrast, our paper focuses on the role of venture capital for investees during the post-IPO stage.

paper tries to investigate the effect of VCs on investees' executive compensation contracts in order to shed light on the channel for VCs to affect investees' decision-making during the post-IPO stage.

In particular, we investigate the following questions under a Chinese institutional background:

(1) Do VCs affect executive compensation contracts or not?

(2) As the ownership of a company has a substantial impact on executive compensation contracts (Wu *et al.*, 2010), and in China, executive compensation in state-owned enterprises (SOEs) is under government control, is there any difference in terms of venture capital's impact on compensation contracts between private companies and SOEs?

(3) It is believed that reputation is a kind of effective substitution for other economic governance mechanisms when a formal mechanism, such as the law, is not efficient. Since China has a typical transitional economy, does the reputation of VCs have an impact on executive compensation contracts?

(4) What are the characteristics of the extra emolument of executive compensation in venture-capital-backed companies?

Executive compensation contracts are considered to be an important corporate governance mechanism which links managers' pay with firm performance and can constrain managers from shirking and abusing their firm's resources (Murphy, 1985; Jensen and Murphy, 1990). Pay-performance sensitivity (PPS) is an important measure for executive compensation contracts.

The determinants of Chinese executive compensation contracts have been widely explored in the literature. These determinants include risk (Zhou and Huang, 2011), managerial power (Fang, 2009; Xie *et al.*, 2012), internal control system (Lu *et al.*, 2011), market environment and government intervention (Liu *et al.*, 2007; Xin, 2009), and the participation of a private entity (Wang and Zhang, 2012). The level of extra emolument in executive compensation and its nature are other important measures for executive compensation contracts. Quan *et al.* (2011) provide an explanation of extra emolument from the perspective of executive power, and Wu *et al.* (2010) test the performance effect of extra emolument from the perspective of compensation fairness. There is almost no literature studying VCs' role in investees' executive compensation contracts.

In this paper, we try to answer these questions using a sample of companies listed in the Chinese market from 2002 to 2011. The results show that PPS is higher in venture-capital-backed companies than in non-venture-capital-backed companies. The further test shows that venture capital's impact on PPS exists in private enterprises rather than in SOEs. Highly reputable VCs have a more significant impact on PPS than VCs

with a low reputation. Furthermore, we also find that venture capital is significantly and positively related to the positive extra emolument of investees, which might indicate that VCs like to motivate executives positively. In short, these findings suggest that even after IPOs, VCs still have a positive impact on the corporate governance of their investees and affect investees' executive compensation.

Our study contributes to the literature in several ways. First, we extend the literature on executive compensation, especially that on institutional investors' influence on executive compensation. Jay and Lurat (2003) investigate the influence of the ownership concentration of outside institutional investors on executive compensation contracts. Wang and Zhang (2012) investigate private equity's influence on PPS, while we focus on VCs' influence on compensation contracts; VCs are believed to have more motivation and ability to affect their investees' corporate governance.

Second, this paper adds to the literature on the effect of VCs' reputation. Krishnan *et al.* (2011) and Shu *et al.* (2011) find that VCs' reputation has an effect on investees' performance. Wu *et al.* (2012) find empirical evidence on the effect of VCs' reputation on investees' financing constraints. In this article, we find that VCs' reputation has an effect on executive compensation contracts.

Third, our findings provide further insights into the existing evidence on VCs' behaviour. Wu *et al.* (2012) find that VCs can inhibit the overinvestment of their investees. Their argument is that VCs can provide more active monitoring of managers. Our findings may indicate that there is another channel through which VCs influence investees' investment policy: VCs can bring in more efficient incentive mechanisms, such as a higher PPS and a more competitive pay level relative to the industry, to guide managers' investment decisions. As a result, agency problems such as overinvestment are alleviated.

Lastly, our findings provide an alternative explanation on extra emolument. Quan *et al.* (2010) provide explanations for the phenomenon of extra emolument from the perspective of managerial power. However, we find that this phenomenon is probably a natural consequence of compensation stickiness and a strong incentive mechanism.

The remainder of the paper proceeds as follows. Section II presents a theoretical analysis of VCs' influence on executive compensation contracts and develops the empirical predictions. Section III describes the sample selection process, the data source, and the model specifications. Section IV presents our main empirical results. Section V presents multiple robustness checks. Section VI concludes the paper.

## **II. Theoretical Analysis and Hypothesis Development**

## 2.1 VCs' Influence on PPS

Jensen and Murphy (1990) argue that compensation contracts are an important mechanism for alleviating agency problems between investors and managers. The basic characteristic of this kind of contract is that it links managers' compensation with stockholders' benefits. The higher the sensitivity of managers' compensation to company performance, the more closely managerial benefits are related to shareholders' benefits. The particular compensation incentives include the performance-based bonus, the adjustment of basic salary, stock options, and the dismissal mechanism. The core aim of these incentives is to induce managers to maximise stockholders' wealth through increasing PPS.

However, in reality, executive compensation contracts tend to be rigged by managers, and thus such contracts are far from optimal. As a result, under some conditions, compensation contracts cannot be an efficient mechanism for alleviating agency problems; rather, they become a kind of agency problem. Bebchuk and Fried (2004) find that managers' power is positively related to managerial compensation. They argue that when the board is controlled by the Chief Executive Officer (CEO), the board can hardly bargain with managers over compensation. In fact, the CEO dominates the compensation determination process. As a result, the CEO's compensation is usually independent of firm performance. Bebchuk and Fried (2004) find that the more powerful the CEO, the less sensitive his/her compensation is to firm performance.

The nature of executive compensation contracts is dependent on the quality of corporate governance. Bertrand and Mullainathan (2001) argue that in poorly governed firms, managers essentially determine their own pay and are able to skim firm profits in the form of pay for luck. Skimming is less prevalent in firms that are well governed. There is evidence that managers are not overpaid in well-governed firms in the sense that stock options are a substitute for other forms of compensation. By contrast, in firms that are not well governed, stock options seem to be strictly additional compensation. Core *et al.* (1999) find that CEO compensation level is significantly related to the characteristics of the board and ownership structure. When the CEO is also the board president or when outside directors are appointed by the CEO, the CEO has a higher compensation level. Jay and Laurat (2003) find that institutional ownership concentration is positively related to PPS and negatively related to the level of compensation, which suggests that outside institutional investors, as a whole, can mitigate the agency problem between shareholders and managers.

Do VCs have an incremental impact on managerial compensation contracts? We argue that there are two channels for VCs to affect compensation contracts: (1) VCs, as monitors, can actively involve themselves in corporate governance; (2) VCs can be

directly involved in managerial compensation contracts.

A great deal of literature supports the positive role of VCs in corporate governance. The role of VCs surpasses that of traditional financial intermediaries. VCs provide support, advice, and monitoring to enhance firm value (Gompers, 2010), and they fulfil their role mainly through their influence on corporate governance. Suchard (2009) finds that the board of director of a venture-capital-backed firm is more independent than that of a non-venture-capital-backed firm: for example, the former has more independent directors as well as more independent directors with industry experience. Lerner (1995) finds that venture capital institutions recruit, through their social networks, experts with industrial experience as independent directors to improve investees' corporate governance. Fried *et al.* (1998) find that the boards of venture-capital-backed firms play a more active role in corporate strategies than those of non-venture-capital-backed firms. Baker and Gompers (2004) find that VCs appear to be a counterweight to the CEO's control. VCs can reduce a CEO's power not only by diluting the CEO's shareholdings but also by appointing more outside directors to the board.

Although studies on venture capital's role in relation to investees mainly focus on the IPO period, there are a few studies where the emphasis is on the post-IPO stage. Baker and Gompers (2003) examine the IPO market in the US from 1978 to 1987 and find that the boards of venture-capital-backed firms have fewer insiders and more independent outside directors. Campbell and Frye (2006) examine changes in the corporate governance of venture-capital-backed firms after IPO and find that venture-capital-backed companies have a bigger and more independent board of directors after IPO.

Another way for VCs to affect managers' PPS is to participate in the compensation contracting process directly. Compensation contracts are an important mechanism for solving cooperation problems between VCs and investees.

Kaplan and Stromberg (2003) study the setting of venture capital investment contracts. They classify the potential agency problems of VC investments into four categories and provide the corresponding solutions:

(1) VCs are concerned that entrepreneurs will not work hard to maximise shareholders' value after an investment is made. The solution to this traditional agency problem (Holmstrom, 1979) is to link entrepreneurs' compensation to firm performance.

(2) Entrepreneurs know more about their own qualities/abilities than the VCs, who can design contracts with a higher PPS that good entrepreneurs will be more willing to accept (Lazear, 1986).

(3) VCs also understand that after an investment has been made, there may be some disagreements between themselves and the entrepreneurs. A solution to this problem is to

give control to the VCs in some situations and to the entrepreneurs in others (Aghion and Bohon, 1992; Dewatripont and Tirole, 1994).

(4) VCs are concerned that when an entrepreneur's human capital is particularly valuable to the company, the entrepreneur can hold a VC to ransom by threatening to leave the venture. VCs can reduce an entrepreneur's incentive to leave by vesting the entrepreneur's shares. The more severe the information problem, the tighter the contracts should be tied to performance. To sum up, contract provisions are dependent on the severity of the information asymmetry between the VC and the entrepreneur. As such problems increase, the founder's compensation will be more performance sensitive, VCs should have stronger control and liquidation rights, and vesting will be more pronounced.<sup>4</sup>

The evidence of VCs' active influence on investees' corporate governance comes mainly from developed economies where the VC industry is rather mature. In China, the VC industry is still in its early stages and has been developing with government guidance and support. In September 1985, the State Council approved the establishment of the China New Technology Venture Investment Corporation, the first Chinese firm specialising in venture investment. Since then, many local governments have established venture capital firms with the aim of hatching technology projects. At the same time, the increase in investment opportunities has also attracted many foreign VCs and promoted the development of private venture capital. Although differences in the market and institutional environment causes differences in VCs' investment behaviour between China and developed countries, evidence from several sources shows that Chinese VCs have been playing active roles in corporate governance and providing other value-added services. *The Research Report on Chinese VCs' Value-Added Services in 2009* shows that the main value-added services include strategic plan support, network expansion, human resource recruitment, and emotional support. Bruton and Ahlstrom (2003) interview 36 VCs from 24 venture capital firms in mainland China and Hong Kong and find that these VCs spend more time and effort overseeing their investees than their counterparts in the Western market. Some typical cases also reflect that VCs involve themselves in the design of their investees' compensation system no matter whether an investee is at the early or the late stage of its development. For example, soon after GuangDong Venture Investment Group invested in Tianbo Co. and became the third largest block shareholder in 2003, it provided a series of value-added services to Tianbo and established four systems, namely a performance appraisal system, a compensation management system,

---

<sup>4</sup> Whether VCs can still affect managerial compensation contracts after IPO is an empirical problem. Usually, the information environment in the venture capital industry will be greatly improved and the lock-up risk greatly reduced after IPO. But even after IPO, VCs may still have the motivation to influence executive compensation since there is a post-IPO lock-up period.

an overall budget system, and a stock options system. Similarly, after their investment in Hongtu Co., they urged the company to improve its appraisal and incentive mechanism. Apart from the above evidence from survey or case studies, some empirical studies also confirm that VCs play a positive role in the improvement of corporate governance in Chinese listed companies. Zhang and Liao (2011) find that VCs can affect the corporate governance structure and that different types of VC have different influences. In particular, they find that foreign VCs have a more positive impact on corporate governance than non-foreign VCs. Both foreign-venture-capital-backed companies and mixed-venture-capital-backed companies have a bigger board, a higher percentage of expert directors, and a smaller shareholding percentage of the controlling shareholder. In short, VCs in China can enhance firm value through improving corporate governance.

In sum, VCs can not only affect managers' compensation contracts by means of improving corporate governance but can also directly take part in the contracting process. Through these channels, VCs can increase the degree of incentive in managers' compensation contracts. On the basis of these arguments, we propose the following hypothesis:

**Hypothesis 1: Managerial PPS in venture-capital-backed companies is higher than that in non-venture capital-backed companies.**

The impact of VCs on investees' corporate governance might be contingent on the nature of the investee, one aspect of which is the characteristic of the controlling shareholder.

There are obvious differences in the managerial compensation determining mechanism between private companies and SOEs. Apart from gaining profits, SOEs also have social and political objectives. In addition, industry protection and government control also limit the ability of the market mechanism to shape compensation contracts in SOEs (Xin, 2009). Unlike compensation in private enterprises, compensation in SOEs is under government regulation. For example, on 16 September 2009, six ministries of the State Council jointly issued the *Guidance on Further Regulating Compensation of Executives in Central Government Controlled Companies* to restrict the compensation structure and limit the compensation levels of executives in SOEs controlled by the central government. The regulation of compensation reflects not only the government's pursuit of profits but also many of the government's social objectives, such as social fairness, full employment, and alleviating financial deficits (Chen *et al.*, 2009). As a result, a high PPS compensation contract between the government and managers in SOEs may not be the optimal option. On the other hand, as Shleifer and Vishny (1994) and Cheng and Indjejikian (2009) point out, government intervention and public opinion can

restrict managers' selfish behaviour, and this moderates the demand for costly compensation schemes. Obviously, compared with managers of private enterprises, SOE managers face more pressure as a result of government intervention and public opinion.

Under this institutional environment, VCs' motivation for investing in private enterprises might be different from their motivation for investing in SOEs, which involves a different role for VCs in investees' corporate governance. So we predict that the impact of VCs on managerial compensation contracts in private firms is different from that in SOEs; that is, when investing in private firms, VCs make profits not only by selecting valuable private projects but also by actively involving themselves in investees' corporate governance. In contrast, when considering SOEs, VCs would rather select a good SOE to invest in than be involved in corporate governance.<sup>5</sup> In addition, compensation in SOEs tends to be regulated by the government.

In conclusion, VCs have a stronger motivation and a greater ability to impact PPS in private firms than in SOEs. We therefore propose the following hypothesis:

**Hypothesis 2: VCs have a stronger impact on managerial PPS in private firms than in SOEs.**

## 2.2 The Impact of VC Reputation on PPS

Nahata (2008) finds that highly reputable VCs will spend more time monitoring their investees. Krishnan *et al.* (2011) find that reputable VCs will take part in corporate governance more actively after IPO (e.g., hold more ownership stakes in the company and more directorships on the board) and have a positive impact on the long-term performance of investees. Relative to VCs with a low reputation, highly reputable VCs are more capable of managing projects, which makes the marginal cost of participating in corporate governance smaller. In addition, while reputation is a symbol of a VC's capability, it is also a symbol of the bargaining power of a VC in contracting between a VC and an investee. Thus, a reputable VC will have more impact on the improvement of corporate governance. Baker and Gompers (2004) find that the probability that a founder remains in the CEO position at the time of IPO decreases as VC reputation increases.

---

<sup>5</sup> In the current context of China, the motivations of VCs to invest in SOEs may include the following: (1) Some VCs are sponsored directly or indirectly by the government. (2) Foreign or private VCs need local governments to offer information on projects or to facilitate cooperation between VCs and entrepreneurs. From our interviews with the officers of local Science and Technology Bureaus and Chambers of Commerce, we know that most VCs hope that the local governments can recommend projects to them. Bruton and Ahlstron (2003) find that VCs in China tend to construct networks with local governments to control the risks of a project. A good relationship with the government can keep them from being involved in commercial fraud. This is the difference between the Chinese venture capital industry and its Western counterparts. (3) Even if VCs keep at arm's length with local governments, they will also select promising SOE projects.



Gompers (2010) finds that both the quality and the exit of a VC will impact corporate governance. The monitoring of CEOs will drop after a high-quality VC exits. To sum up, we propose the following hypothesis:

**Hypothesis 3: Managerial PPS is higher in companies backed by highly reputable VCs than in companies backed by VCs with a low reputation.**

### 2.3 Venture Capital and Managerial Extra Emolument

It is worth further exploring whether managerial PPS is correlated to compensation level, and if it is, how are they correlated? Given that VCs can increase PPS, how does the compensation level in venture-capital-backed companies compare to that in non-venture-capital-backed companies?

In theory, when the performance of a venture-capital-backed company is poor, high PPS will mean that its manager will receive a negative extra emolument relative to the industry benchmark. In contrast, when the performance is good, high PPS will mean that the manager will receive a positive extra emolument.

In reality, VCs expect to improve their investees' performance rapidly in the short term. It is optimal for VCs to provide positive incentives for managers to work hard; that is, given the stickiness of compensation (Fang, 2009), VCs would rather fire a manager than punish him/her by reducing compensation when his/her performance is not ideal. So we predict that venture-capital-backed companies provide a higher positive extra emolument, whereas there is no significant difference in terms of negative extra emoluments between venture-capital-backed companies and non-venture-capital-backed companies.

Similarly, as argued above, since VCs' influence on managerial PPS differs between private enterprises and SOEs, their influence on extra emoluments will also differ. We therefore develop the following hypothesis:

**Hypothesis 4: Venture-capital-backed companies provide higher positive extra emoluments than non-venture-capital-backed companies, and this mainly happens in privately owned firms.**

## III. Sample Selection and Research Design

### 3.1 Sample Selection

We draw our sample from Chinese A-share companies listed between 2002 and 2011. The original sample consists of 16,190 firm-years, 7,812 of which remain after deleting

firm-years with companies under special treatment (ST), financial companies, newly listed companies, and companies with missing variables. The financial data and compensation data are taken from the CSMAR database developed by GTA IT Co., Ltd.

In order to identify the venture-capital-backed firms, we first identify them according to the names of the top 10 shareholders in the CSMAR database. If the name of a shareholder includes such words as “venture”, “capital”, “venture capital”, “venture fund”, or “innovation” and “innovation fund”, then we identify these shareholders as venture capital institutions. Second, we check them with the Zdatabase to confirm that they are included in that database. If they are not found in the Zdatabase, we further confirm whether these institutions are engaged in venture capital investment by reading other materials such as company websites, prospectuses, and the venture capital yearbook. Through this double-check process, we obtain 152 venture capital firms, involving 728 firm-years, in the top shareholders of listed companies between 2002 and 2011. In order to analyse the impact of VCs rather than controlling shareholders on executive compensation contracts, we further delete 43 firm-years in which VCs are the biggest shareholders. Another 21 firm-years with data missing are deleted. Finally, 664 observations involving 146 VC institutions and 247 firms are retained. The identification process used to select the venture-capital-backed sample is shown in Table 1.

**Table 1** Venture-capital-backed Sample Selection Process

|  |      |
|--|------|
| Firms whose names include the words “venture”, “capital”, “venture capital”, “venture fund”, or “innovation” and “innovation fund” | 1590 |
| Excluding:   |      |
| Observations that are not included in the Zdatabase and cannot be identified as venture-capital-backed firms using other materials | 862  |
| Observations where the biggest shareholder is a VC   | 43   |
| Observations with missing variables  | 21   |
| Venture-capital-backed firm-years  | 664  |

## 3.2 Model Specification and Variable Definitions

### 3.2.1 VCs and Managerial PPS

In order to test hypotheses 1 and 2, we follow the existing literature on managerial PPS (Ke *et al.*, 2012; Xin, 2009; Fang, 2009) and specify Model (1). Then, we add *VC*, a dummy variable of venture-capital-backed firms, and its interaction item,

$VC*PERFORMANCE$ , into Model (1) to get Model (2).

$$LNPA Y_{i,t} = \beta_0 + \beta_1 PERFORMANCE_{i,t} + CONTROL_{i,t} + \sum YEAR_t + \sum IND_j + \varepsilon_{i,t} \quad (1)$$

$$LNPA Y_{i,t} = \beta_0 + \beta_1 PERFORMANCE_{i,t} + \beta_2 VC_{i,t} + \beta_3 VC_{i,t} \times PERFORMANCE_{i,t} + CONTROL_{i,t} + \sum YEAR_t + \sum IND_j + \varepsilon_{i,t} \quad (2)$$

In Model (1),  $LNPA Y_{i,t}$ , the dependent variable, is the logarithm of executive compensation, which is measured by the sum of the annual pay of the top three directors. In robustness tests, it is also measured as the annual pay of the CEO or the sum of the annual pay of the top three executives. For the independent variables, performance is measured by the return on equity ( $ROE$ , the ratio of net profit before non-recurring losses and gains to net assets).<sup>6</sup> In robustness tests, it is also measured by the return on total assets ( $ROA$ ). Control variables include the logarithm of total assets at the end of the year ( $SIZE$ ), the ratio of the market value of equity to the book value of equity ( $TQ$ ), leverage ( $LEV$ , the ratio of total liabilities to total assets), the shareholding percentage of the biggest shareholder ( $FRSHD$ ), the shareholding percentage of institutional shareholders except VCs ( $INSTI$ ), the size of the board ( $BDS$ ), the duality of president and CEO ( $CBD$ ), the percentage of independent directors ( $OUTDIR$ ), and the dummy variable of private enterprise ( $PRIV$ ). In addition,  $YEAR_t$  and  $IND_j$  are used to control for the effect of year and industry, respectively.

$VC_{i,t}$  is a dummy variable which takes the value of 1 if there is a venture capital institution among the top 10 shareholders but this institution is not the biggest shareholder in year  $t$ , and 0 otherwise. We are interested in the sign and the significance of the coefficient of the interaction term  $VC_{i,t} \times PERFORMANCE_{i,t}$ . On the basis of hypotheses 1 and 2, we expect that  $\beta_3$  is positive, especially in private enterprises.

At the same time, in order to test Hypothesis 3, we classify VCs into two categories: the high-reputation group and the low-reputation group. The reputation of a venture

---

<sup>6</sup> Corporate performance can be measured as accounting performance or stock performance. Although stock return is critical to shareholders, it is not an optimal measure of managers' performance (Aggarwal and Jorion, 2010) because it can be disturbed by many factors out of managers' control. As a result, accounting performance has more impact on managers' salary and bonus (Lambert and Larcker, 1987; Antle and Smith, 1986). In China, the volatility of the stock market is much higher than it is in developed countries and stock return is not a reliable indicator of managers' performance. The sensitivity of pay to stock return is low in Chinese listed firms (Quan *et al.*, 2010; Wu *et al.*, 2010). So, the existing literature on Chinese markets usually uses accounting performance as a measure of managers' performance (Fang, 2009; Xie *et al.*, 2012; Lu *et al.*, 2011). Furthermore, stock options, as a manager incentive tool, are not popular in China. So, in this paper, we also use accounting performance to measure managers' performance.

capital institution reflects its market power, management ability, and investment performance. We measure the reputation of a venture capital institution by its annual ranking in the venture capital industry, which is determined by the Zero2IPO Group.<sup>7</sup> Specifically, a venture capital institution is regarded as reputable if it is among the top 10 shareholders and as non-reputable otherwise.

In order to test Hypothesis 3, we establish Model 3:

$$\begin{aligned} LNPAY_{i,t} = & \beta_0 + \beta_1 PERFORMANCE_{i,t} + \beta_2 REPUT_{i,t} \\ & + \beta_3 REPUT_{i,t} \times PERFORMANCE_{i,t} + CONTROL_{i,t} \\ & + \sum YEAR_t + \sum IND_j + \varepsilon_{i,t} \end{aligned} \quad (3)$$

$REPUT_{i,t}$  is a dummy variable which equals 1 if the VC is reputable in year  $t$  and 0 otherwise. We are interested in the coefficient of the interaction variable  $REPUT_{i,t} \times PERFORMANCE_{i,t}$ . We expect that  $\beta_3$  is positive.

### 3.2.2 VCs and Managerial Extra Emolument

In order to test Hypothesis 4, we need to calculate managerial extra emolument. As in Core *et al.* (1999) and Wu *et al.* (2010), we construct the following model to obtain extra emolument ( $UF$ ); the definitions of the variables in this model are identical to those in Model (1):

$$\begin{aligned} LNPAY_t = & \beta_0 + \beta_1 SIZE_t + \beta_2 LEV_t + \beta_3 ROE_t + \beta_4 ROE_{t-1} \\ & + \beta_5 CBD_t + \beta_6 BDS_t + \beta_7 PRIV_t + \beta_8 TOPSHARE_t + \varepsilon \end{aligned} \quad (4)$$

Specifically, we first estimate the normal payment of executives, and then we estimate the residual, which is defined as the extra emolument of executives ( $UF$ ).

After calculating the extra emolument, we develop Model (5) following Quan (2010):

$$UF_{i,t} = \beta_0 + \beta_1 VC_{i,t} + CONTROL_{i,t} + \sum YEAR_t + \sum IND_j + \varepsilon_{i,t} \quad (5)$$

In Model (5), the dependent variable is extra emolument ( $UF$ ) and the independent variable is  $VC$ . We are interested in the coefficient of  $VC$ . The control variables include performance variables ( $ROE$  and  $RETURN$ ), ownership characteristics variables ( $FRSHD$ ,  $INSTI$ , and  $PRIV$ ), corporate governance variables ( $CBD$ ,  $BDS$ , and  $OUTDIR$ ), and local average wage level ( $EREA WAGE$ ).  $YEAR$  and  $IND$  are also controlled for.

<sup>7</sup> This annual ranking is based on overall performance, such as the fund amount, the performance of fundraising, the number of investment projects, the number of projects exited, and return on investment.

We summarise all of the variables and their definitions in Table 2. To control for the influence of outliers, we winsorise all of the continuous variables at 1 per cent.

**Table 2 Variable Definitions**

| Variable        | Definition  |
|-----------------|---|
| <i>LNPAY</i>    | Managerial cash pay, which is measured as the natural logarithm of the annual pay of the top three directors in year $t$  |
| <i>ROE</i>      | The ratio of net profit after non-recurring losses and gains to net assets  |
| <i>VC</i>       | A dummy variable that equals 1 if a VC is among the top 10 shareholders but not the biggest shareholder, and 0 otherwise. |
| <i>SIZE</i>     | The natural logarithm of the total assets   |
| <i>LEV</i>      | The ratio of total liabilities to total assets  |
| <i>TQ</i>       | The ratio of the market value of equity to the book value of equity   |
| <i>INSTI</i>    | Ownership percentage of institutional shareholders  |
| <i>FRSHD</i>    | Ownership percentage of the biggest shareholder   |
| <i>OUTDIR</i>   | The percentage of independent directors on the board  |
| <i>CBD</i>      | Dummy variable for chairman-CEO duality, coded 1 if the CEO is also the chairman of the board and 0 otherwise.            |
| <i>BDS</i>      | Size of the board, which equals the number of members on the board.   |
| <i>PRIV</i>     | A dummy variable which equals 1 if the firm is privately owned and 0 otherwise.   |
| <i>TOPSHARE</i> | Percentage of managerial shareholding   |
| <i>RETURN</i>   | Annual return on stocks   |
| <i>GROWTH</i>   | The rate of sales growth.   |
| <i>EREAWAGE</i> | The annual per capita wage of the local area where the listed company is registered                                       |
| <i>REPU</i>     | The dummy variable of VC reputation which equals 1 if the VC is reputable and 0 otherwise.                                |
| <i>YEAR</i>     | Dummy variable for year   |
| <i>IND</i>      | Dummy variable for industry   |

## IV. Empirical Results and Analysis

### 4.1 Descriptive Statistics of VC Investment during Post-IPO Period

Table 3 presents the descriptive statistics of VCs' shareholdings and investment duration after IPO. The mean (median) of VCs' shareholding is 4.65 per cent (3.08 per

cent), with the maximum being 22.5 per cent and the minimum being 0.04 per cent. The average ranking of VCs in investees' top 10 shareholders list is about 5, and the median is 4. Although VCs are not among the top three shareholders, they can influence corporate governance not only through their ownership but also through their networks and ability and their involvement in management.

Since we examine VCs' impact on managerial compensation contracts during the post-IPO period of investees, we need to examine whether there is any substantial change in VCs' shareholdings after IPO. First, some factors might make VCs' behaviour change after IPO: for example, relative to the pre-IPO period, there are more monitoring mechanisms for listed firms after IPO. Second, VCs' ownership in investees tends to be diluted after IPO. One may argue that the incentive for VCs' active monitoring becomes weak due to the free riding effect after IPO. However, we find that although the average of VC ownership is reduced moderately after IPO, VCs' ranking in the top 10 shareholders remains stable (the median rank is 4 in both the pre-IPO and post-IPO periods). Furthermore, the external governing mechanism is not very efficient in Chinese capital markets, and so the monitoring role of VCs will not be weakened sharply during the post-IPO period.

Table 3 also presents the statistics on VCs' investment duration. The maximum investment duration is 13 years, the minimum is 1 year, and the mean and median are 3.41 and 2 years, respectively. This indicates that a large number of venture capital institutions maintain ownership for a long time, even after their investees' IPO. They have a strong motivation to involve themselves in investees' corporate governance to improve firm value even after IPO.

**Table 3 VC Ownership in Investees after IPO: Descriptive Statistics**

| Variable                       | Mean | Median | Std.<br>Deviation | Min  | Max   | Observations |
|--------------------------------|------|--------|-------------------|------|-------|--------------|
| Ownership (%)                  | 4.65 | 3.08   | 4.46              | 0.04 | 22.50 | 664          |
| Ownership rank                 | 4.77 | 4.00   | 2.33              | 2.00 | 10.00 | 664          |
| Investment Duration<br>(years) | 3.41 | 2.00   | 2.80              | 1.00 | 13.00 | 664          |

## 4.2 VCs and Managerial PPS

### 4.2.1 Descriptive Statistics of Main Variables

Panel A in Table 4 presents the descriptive statistics of the main variables. We notice that the mean ownership of executives in listed firms is relatively low, only 0.017 per

cent (see *TOPSHARE* in Panel A). This reflects that cash compensation is still the dominant form of compensation for executives. This is the reason why most studies on Chinese managers' compensation focus on cash payment.

We analyse the effect of VCs on managerial compensation by comparing the mean (median) of firm characteristics, performance, and managerial compensation of venture-capital-backed firms with that of non-venture-capital-backed firms. Panel B of Table 4 shows the results. There is no obvious difference in the mean (median) of compensation level and *ROE* between venture-capital-backed firms and non-venture-capital-backed firms. This indicates that VCs might have a moderate effect on the absolute level of executive compensation and that the performance of venture-capital-backed firms is not necessarily better than that of non-venture-capital-backed firms. The leverage of venture-capital-backed firms is lower than that of non-venture-capital-backed firms. The size of venture-capital-backed firms is smaller than that of non-venture-capital-backed firms, and the *TQ* of venture-capital-backed firms is higher than that of non-venture-capital-backed firms, which indicates that VCs tend to invest in firms with higher growth. In addition, there are some other differences in shareholder characteristics (e.g., the ownership of the largest shareholder and the ownership of institutional investors). So, there are some systemic differences in firm characteristics and shareholders between the two groups. We control for these variables in the following regression analysis.

**Table 4 Descriptive Statistics of Main Variables**

| Panel A         | Total sample |        |        |                |        |        |
|-----------------|--------------|--------|--------|----------------|--------|--------|
| Variable        | Obs          | Mean   | Median | Std. Deviation | Min    | Max    |
| <i>LNPAY</i>    | 7812         | 13.643 | 13.684 | 0.835          | 10.736 | 15.433 |
| <i>VC</i>       | 7812         | 0.085  | 0      | 0.279          | 0      | 1      |
| <i>ROE</i>      | 7812         | 0.063  | 0.076  | 0.169          | -1.225 | 0.374  |
| <i>SIZE</i>     | 7812         | 21.698 | 21.609 | 1.105          | 18.671 | 24.911 |
| <i>LEV</i>      | 7812         | 0.481  | 0.499  | 0.185          | 0.008  | 0.994  |
| <i>TQ</i>       | 7812         | 1.665  | 1.245  | 1.158          | 0.549  | 21.896 |
| <i>INSTI</i>    | 7812         | 5.283  | 1.567  | 8.118          | 0.000  | 66.196 |
| <i>FRSHD</i>    | 7812         | 38.876 | 37.890 | 16.123         | 3.690  | 86.420 |
| <i>OUTDIR</i>   | 7812         | 0.354  | 0.333  | 0.052          | 0.000  | 0.800  |
| <i>BDS</i>      | 7812         | 9.494  | 9.000  | 1.966          | 5.000  | 15.000 |
| <i>CBD</i>      | 7812         | 0.869  | 1      | 0.337          | 0      | 1      |
| <i>PRIV</i>     | 7812         | 0.455  | 0      | 0.498          | 0      | 1      |
| <i>TOPSHARE</i> | 7812         | 0.017  | 0.000  | 0.067          | 0.000  | 0.754  |

| Panel B         | Venture-capital-backed firms vs. non-venture-capital-backed firms |        |             |        |        |             |
|-----------------|---|--------|-------------|--------|--------|-------------|
|                 | Mean  |        |             | Median |        |             |
| Variable        | Non-VC  | VC     | Difference  | Non-VC | VC     | Difference  |
| <i>LNPAY</i>    | 13.640  | 13.686 | (-0.046)    | 13.680 | 13.839 | (-0.159)    |
| <i>ROE</i>      | 0.062   | 0.071  | (-0.009)    | 0.076  | 0.076  | (0.000)     |
| <i>SIZE</i>     | 21.756  | 21.073 | (0.683)***  | 21.630 | 20.925 | (0.705)***  |
| <i>LEV</i>      | 0.491   | 0.377  | (0.114)***  | 0.503  | 0.362  | (0.141)***  |
| <i>TQ</i>       | 1.639   | 1.947  | (-0.308)*** | 1.236  | 1.788  | (-0.552)*** |
| <i>INSTI</i>    | 5.354   | 4.526  | (0.828)**   | 1.530  | 2.439  | (-0.909)*   |
| <i>FRSHD</i>    | 39.385  | 33.386 | (5.999)***  | 38.110 | 32.710 | (5.400)***  |
| <i>OUTDIR</i>   | 0.353   | 0.357  | (-0.004)    | 0.333  | 0.333  | (0.000)     |
| <i>BDS</i>      | 9.516   | 9.266  | (0.250)**   | 9.000  | 9.000  | 0           |
| <i>CBD</i>      | 0.882   | 0.733  | (0.149)***  | 1      | 1      | 0           |
| <i>PRIV</i>     | 0.429   | 0.742  | (-0.313)*** | 0      | 1      | (-1)***     |
| <i>TOPSHARE</i> | 0.010   | 0.089  | (-0.079)*** | 0.000  | 0.000  | 0           |
| N               | 7148  | 664    |             | 7148   | 664    |             |

Note: T-tests for the means and Wilcoxon tests for the medians between venture-capital-backed-firms and non-venture-capital-backed firms. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

#### 4.2.2 Correlation Analysis

In Table 5, we report the correlation matrix, with Pearson (Spearman) correlations being presented above (below) the diagonal. It is noted that the natural logarithm of executive compensation is correlated with *ROE*, *TQ*, *SIZE*, *INSTI*, *FRSHD*, *OUTDIR*, *BDS*, *CBD*, and *PRIV*, which indicates that it is necessary to control for these variables in the regression.

In addition, although *LNPAY* is significantly correlated with *INSTI* (the coefficient is 0.424), *VC* is not significantly correlated with *INSTI* (the coefficients are -0.008 for Spearman and 0.017 for Pearson). *INSTI* is positively correlated with *SIZE*. However, *VC* is negatively correlated with *SIZE*. This reflects that VCs are obviously different from other institutional investors in terms of choice of investment. It also implies that it is valuable to study VCs separately. At the same time, it suggests that if we find that VCs have a significant influence on managers' compensation, we need not worry that the finding is driven by other institutional investors. In general, the correlations between an independent variable and other control variables are relatively low. So, there is no obvious multicollinearity problem in the following regressions.



Table 5 Correlation Matrix

| Variable | LNPAY     | VC        | ROE       | SIZE      | LEV       | TQ        | INSTI    | FRSHD     | OUTDIR    | CBD       | BDS       | PRIV      |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|
| LNPAY    | 1         | 0.015     | 0.297***  | 0.405***  | 0.016     | 0.183***  | 0.326*** | -0.049*** | 0.109***  | -0.039*** | 0.070***  | 0.112***  |
| VC       | 0.018*    | 1         | 0.001     | -0.070*** | -0.077*** | 0.037***  | -0.008   | -0.055*** | 0.015     | -0.054*** | -0.010    | 0.067***  |
| ROE      | 0.415***  | 0.003     | 1         | 0.174***  | -0.206*** | 0.144***  | 0.277*** | 0.105***  | 0.017     | -0.006**  | 0.029***  | 0.018     |
| SIZE     | 0.399***  | -0.072*** | 0.235***  | 1         | 0.338***  | -0.195*** | 0.195*** | 0.241***  | 0.065***  | 0.107***  | 0.229***  | -0.142*** |
| LEV      | 0.018     | -0.076*** | -0.075*** | 0.349***  | 1         | -0.253*** | -0.019*  | -0.015    | 0.032***  | 0.079***  | 0.065***  | -0.042*** |
| TQ       | 0.270***  | 0.067***  | 0.320***  | -0.191*** | -0.260*** | 1         | 0.340*** | -0.161*** | 0.072***  | -0.073*** | -0.108*** | 0.249***  |
| INSTI    | 0.424***  | 0.017     | 0.529***  | 0.331***  | -0.047*** | 0.453***  | 1        | -0.095*** | 0.020*    | -0.018*   | 0.015     | 0.054***  |
| FRSHD    | -0.036**  | -0.053*** | 0.132***  | 0.213***  | -0.021*   | -0.185*** | -0.007   | 1         | -0.016    | 0.069***  | 0.038***  | -0.291*** |
| OUTDIR   | 0.110***  | 0.008     | 0.021*    | 0.066***  | 0.043**   | 0.091***  | 0.067*** | -0.034*** | 1         | -0.045*** | -0.243*** | 0.094***  |
| CBD      | -0.038*** | -0.054*** | -0.021*   | 0.106***  | 0.078***  | -0.094*** | -0.024** | 0.065***  | -0.044*** | 1         | 0.105***  | -0.130*** |
| BDS      | 0.057***  | -0.006    | 0.012     | 0.202***  | 0.065***  | -0.117*** | 0.030**  | 0.025**   | -0.184*** | 0.114***  | 1         | -0.187*** |
| PRIV     | 0.106***  | 0.067***  | 0.073***  | -0.138*** | -0.043*** | 0.298***  | 0.088*** | -0.295*** | 0.068***  | -0.130*** | -0.193*** | 1         |

Note: Pearson (Spearman) correlations are presented above (below) the diagonal. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

### 4.2.3 Regression Analysis

#### (1) VC Backing, Investees' Characteristics, and PPS

To analyse the effect of VCs on managerial PPS, we regress models (1) and (2), respectively. Table 6 reports the results. Column (1) shows that the coefficient on *ROE* is positive and significant at the 1 per cent level. In Model (2), we add *VC* and its interaction item with *ROE* to Model (1). The regression result in column (2) shows that the coefficient on *ROE* is still significantly positive and the coefficient on the interaction variable *VC\*ROE* is positively significant at the 5 per cent level. This indicates that the PPS of venture-capital-backed firms is higher than that of non-venture-capital-backed firms. In addition, the coefficients on the control variables are consistent with previous studies (Ke *et al.*, 2012; Fang, 2009). In sum, VCs improve the PPS of investees, which is consistent with the prediction of Hypothesis 1.

**Table 6 VC Backing and Managerial PPS**

| <i>LNPAY</i>       | (1)                  | (2)                             |
|--------------------|----------------------|---------------------------------|
| <i>VC</i>          |                      | -0.055<br>(-1.15)               |
| <i>ROE</i>         | 0.733***<br>(15.60)  | 0.720***<br>(15.20)             |
| <i>VC*ROE</i>      |                      | <b>0.710**</b><br><b>(2.21)</b> |
| <i>SIZE</i>        | 0.277***<br>(29.43)  | 0.277***<br>(29.38)             |
| <i>LEV</i>         | -0.258***<br>(-5.44) | -0.260***<br>(-5.48)            |
| <i>TQ</i>          | 0.033***<br>(3.95)   | 0.033***<br>(3.91)              |
| <i>FRSHD</i>       | -0.003***<br>(-6.50) | -0.003***<br>(-6.53)            |
| <i>INSTI</i>       | 0.011***<br>(10.94)  | 0.011***<br>(10.94)             |
| <i>BDS</i>         | 0.024***<br>(6.12)   | 0.024***<br>(6.13)              |
| <i>CBD</i>         | -0.09***<br>(-4.45)  | -0.09***<br>(-4.39)             |
| <i>OUTDIR</i>      | 0.508***<br>(3.42)   | 0.507***<br>(3.41)              |
| <i>PRIV</i>        | 0.046***<br>(2.71)   | 0.046***<br>(2.71)              |
| Constant           | 6.754***<br>(31.98)  | 6.766***<br>(31.92)             |
| <i>YEAR, IND</i>   | Yes                  | Yes                             |
| N                  | 7812                 | 7812                            |
| Adj R <sup>2</sup> | 0.434                | 0.436                           |

Note: For each model, t-statistics are provided in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Hypothesis 2 predicts that VCs' effect on PPS is different between private enterprises and SOEs. To test this hypothesis, we classify all of the samples into two subsamples according to the ownership nature of their ultimate controlling shareholders. If the ultimate controlling shareholder is an individual, we classify it as a private firm; if the ultimate controlling shareholder is owned by the government or government agencies, we classify it as an SOE. We then run separate regressions for these two subsamples.

Table 7 reports the results. Regression (1) shows that for private enterprises, the coefficient on  $VC*ROE$  is positive and significant at the 1 per cent level. However, Regression (2) shows that for SOEs, the coefficient on  $VC*ROE$  is not different from 0. The result in Regression (3) shows that the coefficient on the interaction variable  $Priv*VC*ROE$  is significantly positive at the 1 per cent level. This indicates that VCs have a greater effect on managerial PPS in private enterprises than in SOEs, which is consistent with the prediction of Hypothesis 2.

## (2) VCs' Characteristics and PPS

VCs' involvement and bargaining power in investees' decision-making depends on their capability. Investees may have different motivations for having VCs as their shareholders. When a reputable venture capital institution becomes a shareholder, the investee can benefit from the VC's management experience and improve corporate governance. So, we predict that VC reputation has a positive effect on managerial PPS.

To study the effect of VC reputation on the relation between VCs and PPS, we first classify the sample into the low-reputation-VC backed group and the high-reputation-VC backed group. Then we add the interaction term  $REPU*ROE$  into the regression of the total sample. Table 8 shows the results. PPS is higher for the high-reputation-VC backed group (5.888) than that for the low-reputation-VC backed group. In Regression (3), the coefficient on  $REPU*ROE$  is significantly positive at the 10 per cent level. This indicates that reputable VCs have higher influential power over managerial compensation contracts; as a result, managerial PPS improves. The empirical results in Table 8 are consistent with the prediction of Hypothesis 3.

## 4.3 VC Backing and Managerial Extra Emolument

### 4.3.1 Descriptive Statistics and Correlation Analysis

Panel A in Table 9 reports the descriptive statistics of the variables in Model (5). It is noticed that the mean (median) of managerial extra emolument ( $UF$ ) in the sample firms is low, but from its maximum, minimum, and standard deviation, we can see that there is a large dispersion.

Panel B in Table 9 shows that the mean of managerial extra emolument in venture-capital-backed firms (0.051) is greater than that in non-venture-capital-backed

firms (-0.043). However, there is no significant difference in total compensation between the two groups, which indicates that it is the higher PPS in venture-capital-backed firms that makes their extra emolument higher than that in non-venture-capital-backed firms.

**Table 7 VCs, Investees' Ownership Structure, and PPS**

| <i>LNPAY</i>        | (1)<br>Private firms       | (2)<br>SOEs               | (3)<br>Total sample        |
|---------------------|----------------------------|---------------------------|----------------------------|
| <i>VC</i>           | -0.138**<br>(-2.11)        | -0.026<br>(-0.33)         | -0.014<br>(-0.17)          |
| <i>ROE</i>          | 0.566***<br>(8.62)         | 0.885***<br>(12.76)       | 0.866***<br>(12.89)        |
| <i>VC*ROE</i>       | <b>1.710***<br/>(3.42)</b> | <b>-0.233<br/>(-0.55)</b> | <b>-0.152<br/>(-0.35)</b>  |
| <i>PRIV*ROE</i>     |                            |                           | -0.265***<br>(-3.07)       |
| <i>PRIV*VC</i>      |                            |                           | -0.122<br>(-1.19)          |
| <i>PRIV*VC*ROE</i>  |                            |                           | <b>1.912***<br/>(2.93)</b> |
| <i>SIZE</i>         | 0.299***<br>(20.30)        | 0.273***<br>(21.92)       | 0.277***<br>(29.39)        |
| <i>LEV</i>          | -0.308***<br>(-4.32)       | -0.208***<br>(-3.22)      | -0.261***<br>(-5.50)       |
| <i>TQ</i>           | 0.032***<br>(3.17)         | 0.060***<br>(3.58)        | 0.033***<br>(3.95)         |
| <i>FRSHD</i>        | -0.002***<br>(-3.27)       | -0.003***<br>(-5.79)      | -0.003***<br>(-6.59)       |
| <i>INSTI</i>        | 0.010***<br>(6.65)         | 0.010***<br>(7.38)        | 0.011***<br>(10.78)        |
| <i>BDS</i>          | 0.029***<br>(4.37)         | 0.022***<br>(4.35)        | 0.025***<br>(6.21)         |
| <i>CBD</i>          | -0.143***<br>(-4.91)       | -0.035<br>(-1.03)         | -0.097***<br>(-4.45)       |
| <i>OUTDIR</i>       | 0.566**<br>(2.50)          | 0.400**<br>(2.01)         | 0.493***<br>(3.32)         |
| <i>PRIV</i>         |                            |                           | 0.060***<br>(3.42)         |
| Constant            | 7.010***<br>(21.83)        | 6.924***<br>(23.97)       | 6.703***<br>(31.44)        |
| <i>YEAR, IND</i>    | Yes                        | Yes                       | Yes                        |
| N                   | 3558                       | 4254                      | 7812                       |
| Adj_ R <sup>2</sup> | 0.411                      | 0.456                     | 0.435                      |

Note: For each model, t-statistics are provided in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

**Table 8 VC Reputation and Managerial PPS**

| <i>LNPAY</i>       | (1)                         | (2)                          | (3)                  |
|--------------------|-----------------------------|------------------------------|----------------------|
|                    | Low-reputation-VC<br>backed | High-reputation-VC<br>backed | Total sample         |
| <i>ROE</i>         | 1.696***<br>(6.30)          | 5.888***<br>(3.42)           | 1.787***<br>(6.71)   |
| <i>REPU</i>        |                             |                              | -0.149<br>(-0.94)    |
| <i>REPU*ROE</i>    |                             |                              | 2.573*<br>(1.81)     |
| <i>SIZE</i>        | 0.141***<br>(3.42)          | -0.231<br>(-1.29)            | 0.118***<br>(2.98)   |
| <i>LEV</i>         | -0.197<br>(-1.01)           | 0.417<br>(0.40)              | -0.230<br>(-1.22)    |
| <i>TQ</i>          | 0.0528<br>(1.24)            | -0.186<br>(-1.57)            | 0.0108<br>(0.28)     |
| <i>FRSHD</i>       | -0.007***<br>(-2.74)        | -0.013<br>(-1.24)            | -0.008***<br>(-3.59) |
| <i>INSTI</i>       | 0.011**<br>(2.19)           | 0.025<br>(1.03)              | 0.013***<br>(2.64)   |
| <i>BDS</i>         | 0.013<br>(0.67)             | 0.168<br>(1.45)              | 0.020<br>(1.09)      |
| <i>CBD</i>         | -0.281***<br>(-3.37)        | -0.554**<br>(-2.38)          | -0.277***<br>(-3.63) |
| <i>OUTDIR</i>      | 2.302***<br>(3.17)          | 1.844<br>(0.53)              | 2.100***<br>(3.02)   |
| <i>PRIV</i>        | 0.001<br>(0.02)             | 0.252<br>(0.87)              | 0.024<br>(0.35)      |
| Constant           | 9.981<br>(10.67)            | 17.236<br>(3.92)             | 9.940<br>(11.27)     |
| <i>YEAR, IND</i>   | Yes                         | Yes                          | yes                  |
| Adj_R <sup>2</sup> | 0.397                       | 0.311                        | 0.385                |
| N                  | 517                         | 147                          | 664                  |

Note: For each model, t-statistics are provided in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

**Table 9 Descriptive Statistics of Variables**

| Panel A   |        |          |            |          |          |            |
|---|--------|----------|------------|----------|----------|------------|
| Variable  | Obs*   | Mean     | Median     | Std      | Min      | Max        |
| <i>UF</i>   | 7219   | -0.039   | -0.008     | 0.728    | -3.425   | 2.986      |
| <i>RETURN</i>   | 7219   | 0.495    | 0.162      | 1.070    | -0.909   | 16.119     |
| <i>GROWTH</i>   | 7219   | 0.410    | 0.170      | 6.035    | -0.999   | 400.677    |
| <i>EREAWAGE</i>   | 7219   | 28224.41 | 26404.00   | 12621.88 | 10397.00 | 66115.00   |
| Panel B Venture-capital-backed firm vs. Non-venture-capital-backed firm |        |          |            |          |          |            |
|   | Mean   |          |            | Median   |          |            |
|   | Non-VC | VC       | difference | Non-VC   | VC       | difference |
| <i>UF</i>   | -0.043 | 0.051    | (-0.094)** | -0.009   | 0.043    | (-0.052)   |
| <i>LNPAY</i>  | 13.638 | 13.666   | (-0.028)   | 13.685   | 13.848   | (-0.163)   |
| N   | 6604   | 615      |            | 6604     | 615      |            |

\* Observations in this table are fewer than those in Table 4 due to missing values when computing *UF*.

\*\* denotes significance at the 5% level.

The results from the correlation analysis of the main variables also show that *UF* is positively correlated with *VC*, revealing that *VC* backing is correlated with managerial extra emolument (to save space, the correlation matrix is not reported herein). Moreover, the correlation coefficients among the variables are moderately small, indicating that there is no serious multicollinearity in the regression of Model (5).

#### 4.3.2 Regression Analysis

##### (1) VCs and Managerial extra Emolument

Panel A in Table 10 presents the regression results based on Model (5). Regression (2) shows that the coefficient of *VC* is not significantly different from 0. However, when we classify the sample into two groups according to the sign of *UF* and run respective regressions, the coefficient of *VC* in the positive *UF* subsample is significantly positive. The coefficient of *VC* in the negative *UF* subsample is negative, but insignificant. These findings imply that the higher level of positive extra emolument in venture-capital-backed firms comes from a stronger positive incentive than that given to peers in the same industry. In sum, these findings are consistent with the prediction of Hypothesis 4.

To confirm that the high positive extra emolument is due to the positive incentive, we further test whether VCs enforce different incentive strategies according to the relative performance of investees. We compare a firm's performance in each year to the median performance of its industry. If its performance is higher (lower) than the median, it is

classified into the high (low) performance subsample. Panel B in Table 10 shows that in the high performance group, the coefficient of  $VC*ROE$  is significantly positive. When regressed with the total sample, the coefficient of  $HIGH*VC*ROE$  is significantly positive ( $HIGH$  is a dummy variable which equals 1 when the sample is in the high performance group and 0 otherwise). These findings suggest that the stronger positive incentive enforced by VCs is a reason for the higher extra emolument in venture-capital-backed companies.

**Table 10 VC Backing and Managerial extra Emolument**

| Panel A     |              | Dependent variable: $UF$ |                |               |  |
|-------------|--------------|--------------------------|----------------|---------------|--|
|             | (1)          | (2)                      | (3)            | (4)           |  |
|             | Total sample | Total sample             | Positive $UF$  | Negative $UF$ |  |
| $VC$        |              | <b>0.005</b>             | <b>0.081**</b> | <b>-0.035</b> |  |
|             |              | (0.15)                   | (2.53)         | (-0.90)       |  |
| $ROE$       | 1.055***     | 1.054***                 | 0.366***       | 0.530***      |  |
|             | (8.29)       | (8.29)                   | (3.45)         | (3.82)        |  |
| $RETURN$    | 0.019*       | 0.019*                   | 0.033***       | 0.003         |  |
|             | (1.75)       | (1.75)                   | (3.45)         | (0.30)        |  |
| $SIZE$      | -0.320***    | -0.320***                | -0.123***      | -0.142***     |  |
|             | (-35.69)     | (-35.67)                 | (-13.95)       | (-15.07)      |  |
| $LEV$       | -0.029***    | -0.029***                | -0.018***      | -0.007***     |  |
|             | (-11.63)     | (11.63)                  | (-6.00)        | (-3.65)       |  |
| $GROWTH$    | -0.000       | -0.000                   | -0.000         | 0.000         |  |
|             | (-0.74)      | (-0.74)                  | (-0.05)        | (0.08)        |  |
| $EREA WAGE$ | 0.000***     | 0.000***                 | 0.000***       | 0.000***      |  |
|             | (15.02)      | (15.02)                  | (4.83)         | (6.79)        |  |
| $INSTI$     | 0.008***     | 0.008***                 | 0.003***       | 0.003***      |  |
|             | (7.86)       | (7.86)                   | (4.08)         | (3.50)        |  |
| $PRIV$      | -0.131***    | -0.131***                | -0.042***      | -0.032*       |  |
|             | (-7.52)      | (-7.52)                  | (-2.77)        | (-1.79)       |  |
| $CBD$       | 0.116***     | 0.116***                 | 0.001          | 0.083***      |  |
|             | (4.99)       | (4.99)                   | (0.06)         | (3.60)        |  |
| $BDS$       | 0.002        | 0.002                    | -0.001         | 0.003         |  |
|             | (0.49)       | (0.49)                   | (-0.47)        | (0.77)        |  |
| $OUTDIR$    | 0.387**      | 0.387**                  | 0.294**        | 0.086         |  |
|             | (2.50)       | (2.50)                   | (2.11)         | (0.57)        |  |
| $FRSHD$     | -0.004***    | -0.004***                | -0.001**       | -0.002***     |  |
|             | (-8.83)      | (-8.82)                  | (-2.52)        | (-4.09)       |  |
| Constant    | 6.350***     | 6.349***                 | 2.993***       | 2.296***      |  |
|             | (30.89)      | (30.87)                  | (14.54)        | (11.00)       |  |
| $YEAR, IND$ | Yes          | Yes                      | Yes            | Yes           |  |
| N           | 7219         | 7219                     | 3584           | 3635          |  |
| Adj_ $R^2$  | 0.266        | 0.266                    | 0.105          | 0.169         |  |

**Panel B** VC backing and positive incentive

|                    | Dependent variable: <i>LNPAY</i> |                                  |                           |
|--------------------|----------------------------------|----------------------------------|---------------------------|
|                    | (1)<br>Low performance<br>group  | (2)<br>High performance<br>group | Total sample              |
| <i>VC</i>          | 0.095<br>(1.63)                  | 0.206<br>(1.14)                  | 0.159**<br>(2.89)         |
| <i>ROE</i>         | 0.285***<br>(4.99)               | 1.514***<br>(8.55)               | 0.718***<br>(15.16)       |
| <i>VC*ROE</i>      | <b>0.417</b><br>(1.14)           | <b>2.332*</b><br>(1.77)          | <b>0.039</b><br>(0.11)    |
| <i>HIGH*VC*ROE</i> |                                  |                                  | <b>2.567***</b><br>(3.83) |
| <i>SIZE</i>        | 0.250***<br>(17.51)              | 0.286***<br>(23.20)              | 0.277***<br>(29.43)       |
| <i>LEV</i>         | -0.234***<br>(-3.48)             | -0.549***<br>(-8.04)             | -0.270***<br>(-5.69)      |
| <i>TQ</i>          | 0.024**<br>(2.01)                | -0.003<br>(-0.33)                | -0.003***<br>(3.64)       |
| <i>FRSHD</i>       | -0.003***<br>(-4.71)             | -0.005***<br>(-7.60)             | -0.003***<br>(-6.66)      |
| <i>INSTI</i>       | 0.007***<br>(3.36)               | 0.006***<br>(5.24)               | 0.011***<br>(10.88)       |
| <i>CBD</i>         | -0.057*<br>(-1.85)               | -0.121***<br>(-4.12)             | -0.093***<br>(-4.30)      |
| <i>BDS</i>         | 0.027***<br>(4.79)               | 0.023***<br>(4.18)               | 0.024***<br>(6.09)        |
| <i>OUTDIR</i>      | 0.557**<br>(2.76)                | 0.392*<br>(1.86)                 | 0.494***<br>(3.33)        |
| <i>PRIV</i>        | 0.044*<br>(1.84)                 | -0.018<br>(-0.78)                | 0.046**<br>(2.71)         |
| Constant           | 6.784***<br>(21.68)              | 6.722***<br>(24.33)              | 6.483***<br>(30.94)       |
| <i>YEAR, IND</i>   | Yes                              | Yes                              | Yes                       |
| N                  | 3900                             | 3912                             | 7812                      |
| Adj R <sup>2</sup> | 0.426                            | 0.425                            | 0.435                     |

Note: For each model, t-statistics are provided in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

## (2) VC Backing, Property Rights, and Managerial extra Emolument

We further examine whether VCs have a different effect on managerial extra emolument in private enterprises and SOEs. Table 11 reports the results of the regression. The results show that for private enterprises, the coefficient of *VC* is positively significant in the positive *UF* group and not significant in the negative *UF* group. For SOEs, the



coefficients of *VC*, no matter whether in the positive *UF* group or not, are not different from 0. In sum, these findings suggest that VCs have a great effect on private enterprises' incentive system, especially when *UF* is positive. The results in Table 11 are also consistent with Hypothesis 4.

**Table 11 VC Backing, Property Rights, and Managerial extra Emolument**

|                    | Private firm              |                           | SOE                       |                           |
|--------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                    | (1)<br>Positive <i>UF</i> | (2)<br>Negative <i>UF</i> | (3)<br>Positive <i>UF</i> | (4)<br>Negative <i>UF</i> |
| <i>VC</i>          | 0.143***<br>(3.15)        | -0.005<br>(-0.10)         | 0.020<br>(0.42)           | -0.094<br>(-1.60)         |
| <i>ROE</i>         | 0.120<br>(0.77)           | 0.583***<br>(2.71)        | 0.623***<br>(3.96)        | 0.634***<br>(3.40)        |
| <i>RETURN</i>      | 0.038***<br>(2.71)        | -0.000<br>(-0.04)         | 0.026**<br>(2.02)         | 0.015<br>(0.94)           |
| <i>SIZE</i>        | -0.088***<br>(-6.31)      | -0.155***<br>(-10.76)     | -0.153***<br>(-12.81)     | -0.138***<br>(-10.78)     |
| <i>LEV</i>         | -0.020***<br>(-2.85)      | -0.012***<br>(-3.81)      | -0.018***<br>(-5.47)      | -0.003<br>(-1.26)         |
| <i>GROWTH</i>      | 0.000<br>(0.14)           | -0.000<br>(-0.05)         | -0.002<br>(-0.19)         | 0.001<br>(0.28)           |
| <i>EREA WAGE</i>   | 0.000*<br>(1.93)          | 0.000***<br>(3.64)        | 0.000***<br>(5.21)        | 0.000***<br>(5.73)        |
| <i>INSTI</i>       | 0.003**<br>(2.53)         | 0.005***<br>(3.27)        | 0.004***<br>(3.39)        | 0.001<br>(1.23)           |
| <i>CBD</i>         | -0.014<br>(-0.49)         | 0.078**<br>(2.45)         | 0.016<br>(0.54)           | 0.103***<br>(2.95)        |
| <i>BDS</i>         | 0.006<br>(1.04)           | 0.007<br>(1.18)           | -0.009**<br>(-1.99)       | -0.001<br>(-0.37)         |
| <i>OUTDIR</i>      | 0.285<br>(1.29)           | 0.127<br>(0.54)           | 0.251<br>(1.35)           | 0.071<br>(0.35)           |
| <i>FRSHD</i>       | -0.001*<br>(-1.72)        | -0.001<br>(-1.50)         | -0.001**<br>(-2.52)       | -0.002***<br>(-3.85)      |
| Constant           | 2.073***<br>(6.18)        | 2.449***<br>(7.46)        | 3.815***<br>(13.87)       | 2.301***<br>(8.13)        |
| <i>YEAR, IND</i>   | Yes                       | Yes                       | Yes                       | Yes                       |
| N                  | 1609                      | 1616                      | 1975                      | 2019                      |
| Adj_R <sup>2</sup> | 0.180                     | 0.142                     | 0.149                     | 0.209                     |

Note: For each model, t-statistics are provided in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

## V. Robustness Tests

To make sure that our results are robust, we conduct a series of robustness tests.

### 1. Alternative Definitions of Variables

We use alternative measures for executive compensation. Instead of using the annual pay of the three top directors in firm-year regressions, we use the CEO's annual pay or the annual pay of the top three executives. In addition, we also use *ROA* as an alternative measure of accounting performance. In these robustness checks, our conclusions are essentially similar to those reported herein.

### 2. Endogeneity Tests

There is a potential endogeneity problem in our earlier results. The regression results of VCs' impact on managerial compensation may be driven by reverse causality: that is, VC institutions select investees which inherently have relatively high PPS or extra emolument. To test the possible reverse causality, we employ two methods to solve the problem. First, we construct a control group using the propensity score matching (PSM) method to check the potential endogeneity problem (Rosenbaum and Rubin, 1983; Armstrong *et al.*, 2010). In the PSM process, a propensity score for each firm is estimated, and then a venture-capital-backed firm is matched with a non-venture-capital-backed firm according to the proximity of their propensity scores.

We follow Wang and Zhang (2012) and use Model (6) to estimate a firm's propensity to attract venture capital score.<sup>8</sup> We then match a venture-capital-backed firm with a non-venture-capital-backed firm that has a similar propensity score. The regression results of Model (6) show that cash holding, firm age, the holding of the largest shareholder, and the firm's location are related significantly with the VC backing propensity score.<sup>9</sup> We match each venture-capital-backed firm with a non-venture-capital-backed firm.

$$VC = \beta_0 + \beta_1 BV + \beta_2 PROFIT + \beta_3 QRATIO + \beta_4 OCYCLE + \beta_5 CASH + \beta_6 LEV + \beta_7 SIZE + \beta_8 AGE + \beta_9 PRIV + \beta_{10} FRSHD + \beta_{11} LOCAL + \varepsilon \quad (6)$$

Using the matched samples, we run regressions according to models (1) and (2), respectively. The results (see Table 12 Panel A) are essentially similar to those in Tables 6

<sup>8</sup> The variables in Model (6) are defined as follows: *BV* is the ratio of equity book value to total assets; *PROFIT* is the ratio of operating profit to operating assets; *QRATIO* is the quick ratio; *OCYCLE* is the operating cycle, which is the logarithm of the sum of inventory turnover ratio and receivable turnover ratio; *CASH* is the sum of cash and cash equivalents scaled by assets; *AGE* is the number of years after IPO; *LOCAL* is a dummy variable which equals 1 if a firm's place of registration is one of the five provinces (Beijing, Shanghai, Guangdong, Jiangsu, and Zhejiang) and 0 otherwise. Other variables are as defined in Table 2.

<sup>9</sup> To save space, the results of the regression are not reported herein.

and 7, which suggests that the results in Tables 6 and 7 are robust.

**Table 12 Robustness Checks — PSM Method**

| <b>Panel A</b> VC backing and managerial PPS |                           |                           |                        |                           |
|--|---------------------------|---------------------------|------------------------|---------------------------|
|  | Total sample              | Private enterprises       | SOEs                   | Total sample              |
| <i>VC</i>                                    | -0.018<br>(-0.38)         | -0.149*<br>(-1.90)        | 0.065<br>(1.03)        | 0.064<br>(1.00)           |
| <i>ROE</i>                                   | 0.899***<br>(8.71)        | 0.933***<br>(6.47)        | 0.867***<br>(5.67)     | 0.827***<br>(5.44)        |
| <b><i>VC*ROE</i></b>                         | <b>1.057***</b><br>(2.98) | <b>2.397***</b><br>(4.14) | <b>0.176</b><br>(0.39) | <b>0.181</b><br>(0.39)    |
| <i>PRIV*ROE</i>                              |                           |                           |                        | 0.128<br>(0.66)           |
| <i>PRIV*VC</i>                               |                           |                           |                        | -0.194**<br>(-1.97)       |
| <b><i>PRIV*VC*ROE</i></b>                    |                           |                           |                        | <b>2.256***</b><br>(3.13) |
| <i>INSTI</i>                                 | 0.011***<br>(5.37)        | 0.012***<br>(3.48)        | 0.012***<br>(4.21)     | 0.011***<br>(5.29)        |
| <i>PRIV</i>                                  | 0.013<br>(0.42)           |                           |                        | -0.018<br>(-0.49)         |
| N  | 2334                      | 1247                      | 1087                   | 2334                      |
| Adj_R <sup>2</sup>                           | 0.405                     | 0.415                     | 0.356                  | 0.408                     |

  

| <b>Panel B</b> VC Backing and Extra Emolument |                    |                           |                           |                   |                           |                           |                   |     |
|---|--------------------|---------------------------|---------------------------|-------------------|---------------------------|---------------------------|-------------------|-----|
|   | (1)<br>All sample  | (2)<br>Positive <i>UF</i> | (3)<br>Positive <i>UF</i> |                   | (5)<br>Negative <i>UF</i> | (6)<br>Negative <i>UF</i> |                   | (7) |
|   |                    |                           | Private Enterprise        | SOE               |                           | Private Enterprise        | SOE               |     |
| <i>VC</i>                                     | -0.009<br>(-0.14)  | 0.076<br>(1.28)           | 0.187**<br>(2.45)         | -0.150<br>(-1.42) | -0.109<br>(-1.33)         | 0.006<br>(0.06)           | -0.206<br>(-1.49) |     |
| <i>INSTI</i>                                  | 0.009***<br>(2.96) | 0.008***<br>(3.19)        | 0.007**<br>(2.36)         | 0.008**<br>(2.05) | 0.003<br>(0.83)           | 0.008*<br>(1.68)          | -0.009<br>(-1.06) |     |
| N   | 1960               | 1054                      | 513                       | 541               | 960                       | 473                       | 433               |     |
| Adj_R <sup>2</sup>                            | 0.331              | 0.293                     | 0.296                     | 0.245             | 0.258                     | 0.228                     | 0.251             |     |

Note: For each model, t-statistics are provided in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively. To save space, the coefficients on the other control variables in Panel B are omitted.

**Table 13 Robustness Test — Instrument Variable Method**

| <b>Panel A VC Backing and Executive PPS</b>              |                          |                           |                          |                           |                      |                   |                      |
|--|--------------------------|---------------------------|--------------------------|---------------------------|----------------------|-------------------|----------------------|
|  | (1)                      | (2)                       | (3)                      | (4)                       |                      |                   |                      |
|  | Total sample             | Private                   | SOE                      | Total sample              |                      |                   |                      |
|  |                          | enterprise                |                          |                           |                      |                   |                      |
| <i>VC</i>  | -0.012<br>(-0.21)        | -0.073<br>(-0.94)         | 0.017<br>(0.18)          | 0.007<br>(0.08)           |                      |                   |                      |
| <i>ROE</i>   | 0.728***<br>(14.69)      | 0.596***<br>(8.65)        | 0.842***<br>(11.79)      | 0.834***<br>(11.96)       |                      |                   |                      |
| <i>VC*ROE</i>  | <b>0.882**</b><br>(2.56) | <b>1.769***</b><br>(3.31) | <b>-0.046</b><br>(-0.10) | <b>0.051</b><br>(0.11)    |                      |                   |                      |
| <i>PRIV*ROE</i>  |                          |                           |                          | -0.195**<br>(-2.16)       |                      |                   |                      |
| <i>PRIV*VC</i>   |                          |                           |                          | -0.089<br>(-0.75)         |                      |                   |                      |
| <i>PRIV*VC*ROE</i>                                       |                          |                           |                          | <b>1.841***</b><br>(2.63) |                      |                   |                      |
| <i>INSTI</i>   | 0.014***<br>(11.61)      | 0.012***<br>(7.37)        | 0.011***<br>(7.80)       | 0.013***<br>(11.49)       |                      |                   |                      |
| <i>PRIV</i>  | 0.062***<br>(3.54)       |                           |                          | 0.073***<br>(3.98)        |                      |                   |                      |
| <i>IMR</i>   | 0.008<br>(0.23)          | -0.037<br>(-0.68)         | 0.041<br>(0.92)          | 0.008<br>(0.24)           |                      |                   |                      |
| N  | 7812                     | 3558                      | 4254                     | 7812                      |                      |                   |                      |
| Adj_R <sup>2</sup>                                       | 0.396                    | 0.376                     | 0.413                    | 0.397                     |                      |                   |                      |
| <b>Panel B VC Backing and Managerial Extra Emolument</b> |                          |                           |                          |                           |                      |                   |                      |
|  | Total                    | Positive                  | Positive                 | Negative                  | Negative             |                   |                      |
|  | sample                   | UF                        | UF                       | UF                        | UF                   |                   |                      |
|  | (1)                      | (2)                       | (3)                      | (4)                       | (5)                  | (6)               | (7)                  |
|  |                          |                           | Private                  | SOE                       |                      | Private           | SOE                  |
|  |                          |                           | enterprise               |                           |                      | enterprise        |                      |
| <i>VC</i>  | -0.028<br>(-0.40)        | 0.081<br>(1.35)           | 0.218***<br>(2.66)       | -0.128<br>(-1.18)         | -0.130<br>(-1.60)    | -0.015<br>(-0.14) | -0.213<br>(-1.59)    |
| <i>IMR</i>   | -1.172<br>(-0.82)        | 0.878<br>(0.72)           | 2.601<br>(1.45)          | -1.826<br>(-0.86)         | -6.618***<br>(-3.97) | -3.999<br>(-1.63) | -8.517***<br>(-3.50) |
| <i>INSTI</i>   | 0.009***<br>(2.67)       | 0.008***<br>(3.16)        | 0.006<br>(1.97)          | 0.010**<br>(2.34)         | 0.002<br>(0.45)      | 0.008<br>(1.52)   | -0.011<br>(-1.27)    |
| N  | 7219                     | 3583                      | 1608                     | 1975                      | 3635                 | 1616              | 2019                 |
| Adj_R <sup>2</sup>                                       | 0.317                    | 0.289                     | 0.256                    | 0.263                     | 0.297                | 0.217             | 0.242                |

Note: For each model, t-statistics are provided in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

At the same time, we run regressions according to Model (5) with the matched samples. The results (in Table 12 Panel B) are consistent with the results in Tables 10 and 11. The fact that the coefficient of *VC* in regression (2) is not significant may be due to the reduction of the sample in the matching process. The other results are consistent with those in Tables 10 and 11.

Moreover, we follow Wu *et al.* (2012), taking the intensity of venture capital in a firm's location and whether the firm went public after 1998 as instruments.<sup>10</sup> In general, the two instrumental variables are directly related to the investee's probability of successfully attracting venture capital but are not related to PPS or extra emolument. We follow Heckman (1979), using a two-stage method to resolve endogeneity. First, using the instrumental variables, we estimate the Inverse Mill's Ratio (*IMR*) of an investee's selection of a VC. Second, *IMR* is added to models (2) and (5), respectively. Panels A and B in Table 13 present the second stage regression results. The results are also consistent with the results in Tables 6 and 7 and Tables 10 and 11, which adds to our confidence that the main empirical findings are robust. It is noted that although the coefficient of *IMR* is significant in some cases in the second stage regressions, this does not imply the inefficiency of our instrument variables.

## VI. Conclusion

In recent years, a rapid growth in the venture capital industry has been witnessed in China. In an emerging and transitional economy, whether VCs have been playing a positive role in investees' corporate governance is still an open question. From the perspective of top executive compensation, we analyse the impact of VCs on managerial PPS and extra emolument. To conduct empirical tests, we use the data from A-share firms in Chinese capital markets from 2002 to 2011.

We find that managerial PPS and extra emolument in venture-capital-backed firms are significantly higher than those in non-venture-backed firms. Furthermore, we analyse the impact of the nature of an investee's controlling shareholder on the effect of VCs and find that VCs can significantly increase managerial PPS and positive extra emolument in private enterprises, but not in SOEs. We also find that VC reputation has a marginal effect on the managerial PPS of investees; specifically, a reputable VC has a greater impact on managerial PPS. Finally, our findings indicate that the higher PPS in venture-capital-backed firms is one of the main reasons why these firms exhibit higher

---

<sup>10</sup> The reason why we select the event of whether or not the company went public after 1998 as an instrument variable is that in 1998, the *Guidance on Speeding up the Development of the VC Industry* was promulgated and put into effect. Since then, the venture capital industry has been growing rapidly.

extra emoluments.

These findings suggest that not only can the development of the venture capital industry alleviate the financing constraints of investees, it can also improve investees' corporate governance and make them grow healthily. VC institutions tend to actively involve themselves in the corporate governance and management of investees. Our findings also have another two implications: (1) To take advantage of VCs' role in corporate governance, it is necessary to reform SOEs to make room for VC involvement. (2) Our findings offer some empirical support to pioneering enterprises. If they intend to improve their corporate governance, it is better for them to absorb reputable VCs.

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

## References

- Aggarwal, R. K. and Jorion, P. (2010), 'The Performance of Emerging Hedge Funds and Managers', *Journal of Financial Economics* 96 (2): 238-256.
- Aggarwal, R. K. and Samwick, A. (2006), 'Empire-Builders and Shirkers: Investment, Firm Performance, and Managerial Incentives', *Journal of Corporate Finance* 12 (3): 489-515.
- Aghion, P. K. and Bohon, P. (1992), 'An Incomplete Contracts Approach to Financial Contracting', *Review of Economic Studies* 59 (3): 473-494.
- Antle, R. and Smith, A. (1986), 'An Empirical Investigation of the Relative Performance Evaluation of Corporate Executives', *Journal of Accounting Research* 24 (1): 1-39.
- Armstrong, C., Jagolinzer, A., and Larcker, D. (2010), 'Chief Executive Officer Equity Incentives and Accounting Irregularities', *Journal of Accounting Research* 48 (2): 225-271.
- Baker, M. and Gompers, P. A. (2003), 'The Determinants of Board Structure and Function in Entrepreneurial Firms', *Journal of Law and Economics* 46 (2): 569-598.
- Baker, M. and Gompers, P. A. (2004), '*An Analysis of Executive Compensation, Ownership, and Control in Entrepreneurial Firms*', Working Paper, Harvard University.
- Barry, C. B., Muscarella, C. J., Peavy III, J. W., and Vetsuypens, M. R. (1990), 'The Role of Venture Capital in the Creation of Public Companies: Evidence from the

- Going Public Process', *Journal of Financial Economics* 27 (2): 447-471.
- Bebchuk, L. and Fried, J. (2004), *Pay without Performance*, Cambridge: Harvard University Press.
- Bertrand, M. and Mullainathan, S. (2001), 'Are CEOs Rewarded for Luck? The Ones without Principals Are', *Quarterly Journal of Economics* 116 (3): 901-932.
- Bruton, G. D. and Ahlstrom, D. (2003), 'An Institutional View of China's Venture Capital Industry Explaining the Differences between China and the West', *Journal of Business Venturing* 18 (2): 233-259.
- Campbell, T. L. and Frye, M. B. (2006), 'Venture Capitalist Involvement and the Long-run Performance of IPOs', *The Journal of Private Equity* 10 (1): 7-17.
- Chen, G., Yu, X., and Kou, X. (2011), 'Fengxian Touzi Canyu dui Zhongzi Qiye Shouci Gongkai Fahang Jiejia de Yingxiang' (Influence of Venture Capital Participation on IPO Underpricing of Chinese-Capital-Backed Enterprises), *Jingji Yanjiu* (Economic Research Journal), Issue 5: 74-85.
- Chen, X., Chen, D., Wan, H., and Liang, S. (2009), 'Diqu Chayi, Xinchou Guanzhi yu Gaoguan Fubai' (Regional Difference, Compensation Regulation, and Managerial Corruption), *Guanli Shijie* (Management World), Issue 11: 130-143.
- Cheng, S. J. and Indjejikian, R. J. (2009), 'The Market for Corporate Control and CEO Compensation: Complements or Substitutes?', *Contemporary Accounting Research* 26 (3): 701-728.
- Core, J., Holthausen, R., and Larcker, D. (1999), 'Corporate Governance, Chief Executive Officer Compensation, and Firm Performance', *Journal of Financial Economics* 51 (3): 371-406.
- Cyr, L. A., Johnson, D. E., and Welbourne, T. M. (2000), 'Human Resources in Initial Public Offering Firms: Do Venture Capitalists Make a Difference?', *Entrepreneurship: Theory and Practice* 25 (1): 77-91.
- Davila, A. and Foster, G. (2005), 'Management Accounting Systems Adoption Decisions: Evidence and Performance Implications from Early-Stage/Startup Companies', *The Accounting Review* 80 (4): 1039-1068.
- Dewatripont, M. and Tirole, J. (1994), 'A Theory of Debt and Equity: Diversity of Securities and Manager-Shareholder Congruence', *The Quarterly Journal of Economics* 109 (4): 1027-1054.
- Fang, J. (2009), 'Woguo Shangshi Gongsi de Gaoguan Xinchou Cunzai Nianxing ma?' (Does Top Management Compensation Stickiness Exist in Chinese Listed Companies?), *Jingji Yanjiu* (Economic Research Journal), Issue 3: 110-123.
- Fried, V. H., Bruton, G. D., and Hisrich, R. D. (1998), 'Strategy and the Board of Directors in Venture Capital-backed Firms', *Journal of Business Venturing* 13 (6):

493-503.

Gompers, P. (1995), 'Optimal Investment, Monitoring, and the Staging of Venture Capital', *Journal of Finance* 50 (5): 1461-1489.

Gompers, P. (2010), 'Venture Capital', in Eckbo, B. E., *Handbook of Corporate Finance: Empirical Corporate Finance*, Amsterdam: North-holland Press, pp. 481-507.

Hart, O. and Moore, J. (1994), 'A Theory of Debt Based on the Inalienability of Human Capital', *The Quarterly Journal of Economics* 109 (4): 841-879.

He, G. (2010), *Bentu Fengxian Touzi Shiwu – Guangdongsheng Fengxian Touzi Jituan Touzi Anli Jingxuan* (Local Venture Capital Investment Practice – A Collection of Investment Cases by Venture Capital Investment Groups in Guangdong Province), Sun Yat-sen University Press.

Heckman, J. (1979), 'Sample Selection Bias as a Specification Error', *Econometrica* 47 (1): 153-161.

Hellmann, T. and Puri, M. (2002), 'Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence', *The Journal of Finance* 57 (1): 169-197.

Holmstrom, B. (1979), 'Moral Hazard and Observability', *The Bell Journal of Economics* 10 (1): 74-91.

Holmstrom, B. and Tirole, J. (1997), 'Financial Intermediation, Loanable Funds and the Real Sector', *The Quarterly Journal of Economics* 112 (3): 663-691.

Jay, C. H. and Laurat, S. (2003), 'Institutional Investors and Executive Compensation', *The Journal of Finance* 58 (6): 2351-2374.

Jensen, M. C. and Murphy, K. J. (1990), 'Performance Pay and Top Management Incentives', *Journal of Political Economy* 98 (2): 225-264.

Kang, S., Kumar, P., and Lee, H. (2006), 'Agency and Corporate Investment: The Role of Executive Compensation and Corporate Governance', *Journal of Business* 79 (3): 1127-1147.

Kaplan, S. and Stromberg, P. (2003), 'Financial Contracting Theory Meets the Real World: Evidence from Venture Capital Contracts', *Review of Economic Studies* 70 (2): 281-315.

Ke, B., Rui, O., and Yu, W. (2012), 'Hong Kong Stock Listing and the Sensitivity of Managerial Compensation to Firm Performance in State-Controlled Chinese Firms', *Review of Accounting Study* 17 (1): 166-188.

Kortum, S. and Lerner, J. (2000), 'Assessing the Impact of Venture Capital on Innovation', *Rand Journal of Economics* 31 (4): 674-692.

Krishnan, C. N. V., Ivanov, V. I., Masulis, R.W., and Singh, A. K. (2011), 'Venture Capital Reputation, Post-IPO Performance, and Corporate Governance', *Journal of Financial and Quantitative Analysis* 46 (5): 1295-1333.



- Lambert, R. and Larcker, D. (1987), 'An Analysis of the Use of Accounting and Market Measures of Performance in Executive Compensation Contracts', *Journal of Accounting Research* 25 (Supplement): 85-125.
- Lazear, E. P. (1986), 'Salaries and Piece Rates', *Journal of Business* 59 (3): 405-431.
- Lerner, J. (1995), 'Venture Capitalists and the Oversight of Private firms', *The Journal of Finance* 50 (1): 301-318.
- Lerner, J. (1999), 'The Government as Venture Capitalist: The Long-Run Impact of the SBIR Program', *Journal of Business* 72 (3): 285-318.
- Liu, F., Sun, Z., and Li, Z. (2007), 'Zhengfu Ganyu, Hangye Jingzheng yu Xinchou Qiyue: Laizi Guoyou Shangshi Gongsi de Jingyan Zhengju' (Government Intervention, Industry Competition, and Compensation Contracts: Empirical Evidence from State-owned Listed Companies), *Guanli Shijie* (Management World), Issue 9: 76-84.
- Lu, R., Liu, J., and Xu, N. (2011), 'Neibu Kongzhi, Chanquan yu Gaoguan Xinchou Yeji Mingandu' (Internal Control, Ownership, and Executive Pay-Performance Sensitivity), *Kuaiji Yanjiu* (Accounting Research), Issue 10: 42-48.
- Murphy, K. (1985), 'Corporate Performance and Managerial Remuneration: An Empirical Analysis', *Journal of Accounting and Economics* 7 (1-3): 11-42.
- Nahata, R. (2008), 'Venture Capital Reputation and Investment Performance', *Journal of Financial Economics* 90 (2): 127-151.
- Quan, X., Wu, S., and Wen, F. (2010), 'Guanliceng Quanli, Siyou Shouyi yu Xinchou Caozong' (Managerial Power, Private Gains, and Compensation Manipulation), *Jingji Yanjiu* (Economic Research Journal), Issue 11: 73-87.
- Rosenbaum, P. and Rubin, D. (1983), 'The Central Role of the Propensity Score in Observational Studies for Causal Effects', *Biometrika* 70 (1): 41-55.
- Ryan, H. and Wiggins, R. (2002), 'The Interactions between R&D Investment Decisions and Compensation Policy', *Financial Management* 31(1): 5-29.
- Shleifer, A. and Vishny, R. W. (1994), 'Politicians and Firms', *The Quarterly Journal of Economics* 109 (4): 995-1025.
- Shu, P. G., Yin, H. Y., Chiu, S. B., and Ho, F. S. (2011), 'The Reputation Effect of Venture Capital', *Review of Quantitative Finance and Accounting* 36 (4): 533-554.
- Suchard, J. A. (2009), 'The Impact of Venture Capital Backing on the Corporate Governance of Australian Initial Public Offerings', *Journal of Banking and Finance* 33 (4): 765-774.
- Titman, S. and Trueman, B. (1986), 'Information Quality and the Valuation of New Issues', *Journal of Accounting and Economics* 8 (2): 159-172.
- Wang, C. K., Wang, K., and Lu, Q. (2003), 'Effects of Venture Capitalists Participation

- in Listed Companies’, *Journal of Banking and Finance* 27 (10): 2015-2034.
- Wang, H. and Zhang, R. (2012), ‘Simu Guquan Touzi yu Beitouzi Qiye Gaoguan Xinchou Qiyue – Jiyu Gongsi Zhili Shijiao de Yanjiu’ (Private Equity Investment and Investee Executive Compensation Contracts – A Study from the Perspective of Corporate Governance), *Guanli Shijie* (Management World), Issue 9: 156-167.
- Wu, C., Wu, S., Cheng, J., and Wang, L. (2012), ‘Fengxian Touzi dui Shangshi Gongsi Tourongzi Xingwei Yingxiang de Shizheng Yanjiu’ (An Empirical Study on the Influence of Venture Capital Investment on the Investment and Financing Behaviour of Listed Companies), *Jingji Yanjiu* (Economic Research Journal), Issue 1: 105-119.
- Wu, L., Lin, J., and Wang, Y. (2010), ‘Xinchou Waibu Gongpingxing, Guquan Xingzhi yu Gongsi Yeji’ (Compensation External Fairness, Equity Structure, and Corporate Performance), *Guanli Shijie* (Management World), Issue 3: 117-126.
- Wu, Y. and Wu, S. (2010), ‘Gaoguan Xinchou: Jili Haishi Zili? – Laizi Zhongguo Shangshi Gongsi de Zhengju’ (Executive Compensation: Incentives or Self-Interests? – Evidence from Listed Firms in China), *Kuaiji Yanjiu* (Accounting Research), Issue 11: 40-48.
- Xie, D., Lin, L., and Chen, Y. (2012), ‘Xinchou Weiyuanhui Dulixing yu Genggaode Jingliren Baochou-Yeji Mingandu’ (Compensation Committee Independence and Higher Executive Pay-Performance Sensitivity), *Guanli Shijie* (Management World), Issue 1: 121-140.
- Xin, Q. (2009), ‘Shichanghua Gaige, Qiye Yeji yu Guoyou Qiye Jingli Xinchou’ (Marketisation Reform, Corporate Performance, and SOE Executive Compensation), *Jingji Yanjiu* (Economic Research Journal), Issue 11: 68-81.
- Xin, Q., Lin, B., and Wang, Y. (2007), ‘Zhengfu Kongzhi, Jingli Xinchou yu Ziben Touzi’ (Government Control, Executive Compensation, and Capital Investment), *Jingji Yanjiu* (Economic Research Journal), Issue 8: 110-122.
- Zhang, X. and Liao, L. (2011), ‘Fengxian Touzi Beijing yu Gongsi IPO: Shichang Biaoxian yu Neizai Jili’ (Background of Venture Capital Investment and Firm IPO: Market Performance and Internal Mechanism), *Jingji Yanjiu* (Economic Research Journal), Issue 6: 118-132.
- Zhou, J. and Huang, D. (2006), ‘Shangshi Gongsi Gaoji Guanliceng Xinchou Yeji Mingandu yu Fengxian Zhijian Guanxi de Shizheng Jianyan’ (An Empirical Study on the Relationship between Executive Pay-Performance Sensitivity and Risks of Listed Companies), *Kuaiji Yanjiu* (Accounting Research), Issue 4: 44-50.