Venture Capitalist Directors and Managerial Incentives*

Lubomir P. Litov
University of Oklahoma

Xia (Summer) Liu
University of Richmond

William L. Megginson
University of Oklahoma
University of International Business & Economics (Beijing)

Romora E. Sitorus
Indonesian Ministry for Economic Affairs

October 17, 2023

Abstract

We examine the effect of board members with venture capital experience (VC directors) on executive incentives at non-venture-backed public firms. VC directors serving on the compensation committee are associated with greater CEO risk-taking incentives (vega) and pay-for-performance sensitivity (delta). These effects are more substantial if VC directors are from highly reputable VC firms. Using availability of direct flights to VC hub cities and annual estimates of VC dry powder per industry as instruments, we show that these results are causal. In addition, VC directors are more focused on growth performance goals in CEO compensation contracts. We also document that prior finding of greater research intensity and innovation when VC directors serve on boards of public firms is partly explained by increased risk-taking incentives of the CEO instilled by such directors. Lastly, we find that having VC directors on nominating and/or governance committees is associated with a higher likelihood of forced CEO turnover.

JEL Classification: G24, G34, J33
EFM Classification: 110, 190, 810
Keywords: Executive compensation, Board of directors, Venture Capital experience

---

*Litov can be contacted at litov@ou.edu, Liu at sliu@richmond.edu, Megginson at wmegginson@ou.edu, and Sitorus at romora.sitorus@prakerja.go.id. We thank Aaron Burt, Felipe Cabezón (discussant), Nishant Dass, Ofer Eldar, Michael Ewens, Chitru Fernando, Katherine Guthrie, Jack He, Danial Hemmings (discussant), Yael Hochberg, Sara Holland, Pornsit Jiraporn, Egle Karmaziene (discussant), Krish Krishnan, Josh Lerner, Scott Linn, Song Ma, Shawn Mobbs, Raj Nahata, Florian Peters, Paul Pfleiderer, Jared Stanfield, Ajai Singh, Eshwar Venugopal (discussant), Alex Wagner, Runzu Wang, Noam Wasserman, Shao Xia (discussant), Yutong Xie, Pradeep Yadav, and seminar participants at Missouri State University, University of Oklahoma, University of Richmond, University of Scranton, Sofia University, the 2020 FMA Annual Meeting, the 2022 European FMA Annual Meeting, the 2022 World Finance Conference, the 2022 Conference on International Finance, Sustainable and Climate Finance and Growth at the Universita Degli Studi di Napoli, the 2022 FMCG Conference at Monash University, the 2023 6th Erasmus Corporate Governance Conference, the 2023 Conference on Empirical Legal Studies (CELS) at the University of Chicago Law School for helpful comments. We thank Jared Stanfield for code to calculate current delta and vega. All errors are our own.

Venture Capitalist Directors and Managerial Incentives

Abstract

We examine the effect of board members with venture capital experience (VC directors) on executive incentives at non-venture-backed public firms. VC directors serving on the compensation committee are associated with greater CEO risk-taking incentives (vega) and pay-for-performance sensitivity (delta). These effects are more substantial if VC directors are from highly reputable VC firms. Using availability of direct flight to VC hub cities and annual estimates of VC dry powder per industry as instruments, we show that these results are causal. In addition, VC directors are more focused on growth performance goals in CEO compensation contracts. We also document that prior finding of greater research intensity and innovation when VC directors serve on boards of public firms is partly explained by increased risk-taking incentives of the CEO instilled by such directors. Lastly, we find that having VC directors on nominating and/or governance committees is associated with a higher likelihood of forced CEO turnover.

JEL Classification: G24, G34, J33

EFM Classification: 110, 190, 810

Keywords: executive compensation, board of directors, venture capital experience

October 17, 2023

1. Introduction

Prior research has collectively shown that the use of high-powered incentives -- particularly performance-based executive compensation schemes in the form of restricted stock and option grants-- has increased considerably over the past three decades (Murphy, 1999; Perry and Zenner, 2000; Hall and Murphy, 2003; Goldman and Slezak, 2006; Edmans, Gabaix, and Jenter, 2017). Two important effects of this growth have been a significant rise in delta, the sensitivity of CEO wealth to stock price (Hall and Liebman, 1998; Jensen and Murphy, 1990), and a similar rise in vega, the sensitivity of CEO wealth to stock price volatility (Coles, Daniel, and Naveen, 2006). Earlier studies also document that venture capitalists (VCs) use both cash and equity compensation to align venture-backed startups' CEO incentives with those of the equity investors (Baker and Gompers, 1999; Hellmann, 2000; Hellmann and Puri, 2002; Hsu, 2004; Wasserman, 2006; Kaplan, Sensoy, and Strömberg, 2009; Puri and Zarutskie, 2012; Chemmanur, Krishnan, and Nandy, 2011; Bengtsson and Hand, 2011; Ewens, Nanda, and Stanton, 2020). There is, however, minimal evidence on whether the presence of board members with venture capital experience (hereafter VC directors) in publicly listed companies impacts the use of high-powered incentives in their executive compensation contracts.

We study the role of VC directors in designing executive compensation contracts in non-VC-backed publicly listed firms. We hypothesize that the appointment of VC directors is associated with stronger pay-risk (vega) and stronger pay-performance (delta) sensitivities. We find support for these hypotheses using executive compensation data over 1998 - 2018. To be more specific, we define a VC director as a director who has prior VC experience—he or she becomes employed by a VC firm *before* appointment as director in the public firm of interest. Our results show that the membership of VC directors in the compensation committee is associated with greater CEO vega and greater CEO delta after controlling for a series of factors and industry and year fixed effects. However, we do not find similar results if VC directors are on other board committees such as governance, audit, or nomination

committees. Our baseline results are robust after controlling for whether the company has beneficial ownership owned by a venture capital. Using the Lee, Pollock, and Jin (2011) VC reputation index, we also document that these effects are more substantial if VC directors are from highly reputable VC firms. Other cross-sectional analysis shows that these effects are more pronounced if firms have more robust governance, higher institutional ownership, lower CEO pay slice, younger CEO age, fewer business segments, or a lower percentage of independent board members. Regarding CEO pay components, having VC directors on the compensation committee is associated with higher excess compensation, higher total compensation, and higher option pay. After investigating CEO equity grants and performance goals, we find that the mechanism by which VC directors influence CEO incentives emphasizes growth and not profitability or market-based performance goals and more frequently uses absolute rather than relative performance goals. Furthermore, the size of performance peer firms with VC directors is significantly larger than firms without, supporting our finding that VC directors emphasize scale rather than short-term profitability. Lastly, we do a placebo test to show that VC directors add stronger CEO incentives through their expertise and experience, rather than VC affiliations which could be coincidental.

In our empirical framework, an identification problem may arise if VC directors are not randomly distributed among public companies' boards, and the presence of VC directors is related to the corporate demand for VC-specific financial expertise. For example, a corporate board wishing to set more aggressive corporate goals may do so by embedding such goals in the executives' incentives. It is also possible that such boards seek to hire VC directors to aid them in setting goals and designing executive compensation to achieve those objectives, indicating non-random appointments of VC directors (Hermalin and Weisbach, 2003; Sørensen, 2007; Wintoki, Linck, and Netter, 2012). To mitigate the endogeneity concerns, we use (i) instrument variable (IV) analysis in the Two-Stage Least

Squares (2SLS) and the dynamic Generalized Method of Moments (GMM) framework, and (ii) propensity matching methods.

First, in our IV analysis, we employ three groups of instruments. The first group of instruments is a set of indicators of annually available direct flights from a company's headquarters location to two main VC hub cities - San Francisco and Boston. Bernstein, Giroud, and Townsend (2016) show that the availability of direct flights can reduce venture capitalists' travel time and thus reduce VC monitoring costs. Therefore, having direct flights from VC hub cities to company headquarters is positively associated with the likelihood of appointing VC directors, while unrelated to CEO compensation design. The second group of instruments is constructed based on the industry-year level of VC dry powder, which is defined as the investible but un-invested VC capital that has been raised from funds' limited partners (Aggarwal et al. 2022). The rationale for using VC dry powder is that it captures the opportunity cost of venture capital executives in serving as directors on boards of non-venture backed public firms. Higher VC dry powder, therefore, indicates a greater opportunity cost of such external commitments and hence lower availability of venture capital executive officers for VC directorships. The third instrument is the location-year level supply of VC executives, which is constructed as the total number of unique VC executives available within 30 miles of a Compustat company's headquarter location. We use the number of VC executives as a proxy for VC expert supply. Applying the three groups of instruments to 2SLS and dynamic GMM framework, we show that our results are robust to the potential endogeneity concerns. Second, we utilize the propensity score matching (PSM) techniques to determine whether firms with VC directors have higher CEO vega and delta than firms without VC directors. Using a Logit model to estimate a firm's propensity to have VC director(s) on board as a function of control variables and industry and year fixed effects, we perform one-to-one matching with no replacement. The results from this matching procedure are consistent with our baseline results.

Our findings align with Celikyurt et al. (2014), who show that firms with VC director(s) have greater research and development intensity, higher innovation output, and increased deal activity with other VC-backed firms. They argue that venture capitalist innovation-specific expertise allows boards to better assess the merits of increasing research initiatives and set the appropriate strategic priorities for such initiatives. Consistent with this result, we show that one possible channel by which VC directors promote corporate innovation is increasing CEO incentives. Our results hold for both innovation inputs, measured by R&D intensity, and innovation outputs, measured by the number of patents and patent economic value (Kogan et al., 2017).

We also examine the impact of VC directors on CEO forced turnover and find that having one or more VC directors on the nomination and/or governance committees is associated with a higher likelihood of forced CEO turnover if firms have poor stock performance. This is consistent with Hochberg (2012), who documents that venture capital firms facilitate good corporate governance. We add new evidence that such an effect operates among non-VC-backed publicly-listed mature companies.

This paper reexamines the advisory roles of VC directors in non-venture-backed public firms to uncover the channels through which such directors affect executive compensation. We contribute to the existing literature in three ways. First, using more recent data on executive compensation, our research examines the role of VC directors in strategic decision-making in listed firms. In particular, our research explores the compensation channels through which directors with VC experience increase corporate risk-taking and complements the literature on how independent directors' characteristics influence executive compensation contracts.[1] Second, our findings contribute to

[1] Within an agency framework, independent directors on corporate boards serve key functions for organizations: selection, monitoring, remuneration, and retention of managers. The advisory role of independent directors on the board has a prominent place in the literature on CEO compensation. Faleye, Hoitash, and Hoitash (2011) show that directors' effectiveness lowers excess executive compensation. On the other hand, Coles, Daniel, and Naveen (2006) assert that Tobin's Q increases in board size and the fraction of insiders on the board. Along the same lines, Core, Holthausen, and Larcker (1999) find that CEO compensation is a decreasing function of the percentage of inside directors on the board.

understanding the relationship between boards of directors' expertise and executive compensation. More precisely, we discuss the differences in performance goal-setting when VC directors are involved with the compensation committee and show they emphasize growth objectives instead of profitability or stock price objectives. Third, we provide supporting evidence to Celikyurt et al. (2014) suggesting that VC directors improve executive incentives to innovate by changing the design of top management compensation schemes and increasing CEO monitoring, which may result in greater CEO turnover propensity following weak shareholder returns.

The paper is organized as follows. Section 2 reviews the literature and develops hypotheses. Section 3 describes the sample and measurement construction and presents sample summary statistics. Section 4 presents the main results and discusses robustness checks. Section 5 concludes.

2. Prior literature and hypothesis development

Corporate boards can add value to companies by monitoring and advising the executive team (Hermalin and Weisbach, 2003, Adams and Ferreira, 2007) and/or by formally setting executive compensation contracts. For example, Mobbs (2013) shows that board monitoring leads to higher CEO pay-performance sensitivity. Li and Srinivasan (2011) show that firms in which founders serve as a director have more high-powered incentives—higher pay-for-performance sensitivity, lower excess compensation, and higher CEO turnover-performance sensitivity—than other firms. Hallock (1997) shows that CEOs who reciprocally interlock their boards earn significantly higher compensation. Other studies investigate the effect of board structure on CEO compensation (Yermack, 1996; Angbazo and Narayanan, 1997; Core, Holthausen, and Larcker, 1999; Cyert, Kang, and Kumar, 2002; Vafeas, 2003; Bertrand and Mullainathan, 2001; Grinstein and Hribar, 2004; Chhaochharia and Grinstein, 2009; Laux and Laux, 2009; Guthrie, Sokolowsky, and Wan, 2012). Yet empirical assessments of the role of board structure on CEO compensation are often deemed inconclusive since board structure is an endogenous variable, determined by unobservable firm and

CEO characteristics that, in turn, affect CEO compensation (Thorburn, 1997; Hermalin and Weisbach, 2003).

Our article is also broadly related to the literature on board expertise and corporate policies. Fama and Jensen (1983) document that providing expertise is an essential role of corporate boards. Among more recent studies, Güner, Malmendier, and Tate (2008) examine how the financial knowledge of bankers on the board affects financing arrangements; Dass et al. (2014) find that directors from related industries significantly impact firm value/performance; and Celikyurt et al. (2014) explore how venture capital expertise affects corporate investment policies, especially R&D and innovation.

On the other hand, venture capitalists have substantial representation on the board of startups in their portfolios (Barry et al., 1990; Megginson and Weiss, 1991; Lerner, 1995) and provide monitoring to limit the opportunistic behavior of their portfolio firms' managers (Rajan, 1992; Admati and Pfleiderer, 1994; Gompers, 1995). In particular, venture capitalists play an essential role in small and private start-ups by performing critical services, including attracting talented executives through management recruiting and resolving compensation issues (Gorman and Sahlman, 1989). More recent studies show that VCs also play a significant monitoring role as directors of mature public companies (Bottazzi, Da Rin, and Hellmann, 2008). Celikyurt et al. (2014) document that 4.7% of Standard & Poor's (S&P) 1500 companies' directors have VC experience before board appointments.

Concerning the role of VC investors in unlisted VC-backed companies' boards of directors, prior theoretical literature has identified several ways that the investor/principal can mitigate conflicts of interest between the entrepreneur and an investor with the funds to finance the venture. As summarized by Kaplan and Strömberg (2003), VC investors may perform the following activities: (i) select profitable projects and promising entrepreneurs, (ii) create an incentives scheme that aligns the interest of entrepreneurs with those of investors, and (iii) monitor ongoing projects. VCs invest in

entrepreneurs who need financing to fund a promising project or company. VCs have strong incentives to maximize value but, at the same time, receive few or no private benefits of control. On the other hand, VCs typically receive at least 20 percent of the profits on their portfolios (Hart, 2001; Gompers and Lerner, 1999).

Several empirical studies document the impact of VCs on entrepreneurs' compensation. For example, by conducting a detailed analysis of 213 actual contracts between VCs and entrepreneurs, Kaplan and Strömberg (2003) document that VCs change the entrepreneur's equity compensation function, making it more sensitive to performance when incentive and asymmetric information problems are more severe while separating cash flow rights and control rights and making both dependent on verifiable measures of performance. Another example is Hellman and Puri (2002) who hand-collect a sample of 173 start-up firms from California's Silicon Valley and find that VC-financed firms are more likely to professionalize by adopting stock option plans and do so more expeditiously. Venture-backed firms are more likely and quicker to bring in CEOs from outside the firm. VCs also expect to be active in other areas, such as developing a business plan, assisting with acquisitions, facilitating strategic relationships with other companies, and/or designing employee compensation.

Based on the above literature, we hypothesize that mature non-venture-backed publicly listed firms with VC directors as compensation committee members should be associated with higher CEO vega and CEO delta compared with firms without VC directors on the compensation committee.

3. Variable measurement and sample selection

3.1. Sample selection

The data in this study are gathered from various sources. Data on board characteristics and board committees are from the Institutional Shareholder Services (ISS). Executive compensation data are from the Compustat ExecuComp. The initial sample contains companies at the intersection of the

two databases from 1998-2018. Venture capital data are collected from the Securities Data Company (SDC) VentureXpert. The IPOs and firm age data are collected from the SDC and Professor Jay Ritter's website following the procedure to link to conventional data sources (CRSP, Compustat) described by Lowry, Michaely, and Volkova (2017). Other firm-level information is obtained from CRSP and Compustat. As a primary screening, we exclude financial institutions (SIC codes between 6000 and 6999) and utilities (SIC codes 4900 and 4999) from the sample to attenuate the potential effect of industry-specific regulation on director appointments. The requirement of control data availability further reduces the sample size to 19,612 firm-year observations. After excluding VC-backed IPOs, we are left with 16,085 observations for 1,707 unique firms, among which 11,064 observations have CEO vega and CEO delta available.

3.2. Measurement of VC experience of directors

To identify directors with VC experience, we extend the approach of Celikyurt et al. (2014). First, we collect detailed director-level employment data from ISS between 1998 and 2018. ISS provides information on the primary employer's name, primary employment category, other employment titles, and each director's type of employment services. A director serving on the board of a non-venture-backed public firm in our sample is identified as a possible VC director if the keywords 'venture', 'capital', 'partner', 'fund', 'investor', 'angel', 'finance', 'financial', or 'management' is available in any of these data items, and we record the director as a possible candidate for being a VC director. Next, we link the director's primary employer name to the name of the venture capital firm in the SDC VentureXpert database using a fuzzy matching method similar to Bernstein, Giroud, and Townsend (2016). Moreover, we also check the biography of each of the possible VC directors from proxy statements. In particular, we check whether they have worked for a firm registered as a venture capital firm in the SDC VentureXpert database. Finally, in our data collection, we manually review the information to refine and evaluate whether the primary employer of each VC director is a

venture capital firm that invests in early-stage companies by reading the VC director employer firm's official information from several websites including www.crunchbase.com and www.bloomberg.com.[2]

Importantly, we only consider VC directors who have prior VC experience. If an existing director, at some point in time during his/her tenure with the sample firm, acquires affiliation with a VC firm, he/she is not assigned as a VC director, and we define them as "coincidental VC directors" instead. Later, in robustness checks, we show that the impact of VC directors does not come from the coincidental VC directors. The purpose of this requirement is to capture the incentive spillover effect that VC directors have and to precisely investigate the impact of VC experience rather than coincidental VC affiliation. In addition, if a director only has previous VC experience but is no longer at a VC firm while being a director, it is not considered a VC director for the following reasons. First, VC expertise is dynamic and primarily focused on the commercialization of novel technologies, so it could be less relevant when historic. Second, including past VC experience cases in the control group, and not including them into the treatment group, biases us toward finding no results if past VC expertise is similar in its implications for CEO compensation to concurrent expertise.

3.3. Measurement of executive compensation incentives

Following previous literature, we measure executives' equity portfolio vega as the change in the risk-neutral Black-Scholes value of the executive's current year option grant for a 1% change in the standard deviation of the underlying stock returns (Guay, 1999; Coles, Daniel, and Naveen, 2006, Low, 2009; Armstrong and Vashistha, 2012, Hayes, Lemmon, and Qiu, 2012). Similarly, we measure executives' equity portfolio delta as the change in the risk-neutral value of the executives' current year equity portfolio for a 1% change in the underlying stock price. We use the natural logarithm of both variables in our regression analysis since delta and vega are highly skewed.

[2] See Appendix B for more details about the matching procedure.

Table 1 presents summary statistics for the 16,085 firm-year observations. Panel A reports the presence of VC directors by year. The proportion of firms appointing VC directors to the board increases almost monotonically over time. For example, while 0.94% (0.40%) of the firms have at least one VC director on the board (on the compensation committee) in 1998, the ratio increases to 6.90% (3.37%) in 2018. Panel B describes the presence of VC directors by industry. Our sample covers all ten remaining Fama and French 12 industries since financial and utility firms are excluded in our initial screen. The telephone and television transmission industry has the highest percentage of firms with VC directors on board (9.57%), followed by the business equipment industry (6.67%). Firms in the consumer durables industry have the lowest propensity to have a VC director. On average, 4.68% (2.28%) of the firm-year observations in our sample have a VC director (VC director member of the compensation committee).

[Insert Table 1 about here]

Table 2 presents summary statistics on CEO compensation, CEO characteristics, board of directors' characteristics, firm characteristics, and other variables used in our regressions. Following past literature (Guay, 1999; Core and Guay, 1999; Coles, Daniel, and Naveen, 2006), we winsorize vega, delta, compensation variables, and other continuous control variables at the 1st and 99th percentile. On average, firms with VC directors on the compensation committee have higher total compensation incentives than firms without VC directors on the compensation committee. Total CEO compensation averages $5,943,182 (1000*e^8.69) for firms with VC directors on the compensation committee and $3,568,854 for firms without. Total CEO vega averages $34,813 per unit of stock volatility change for firms with VC directors on the compensation committee and $17,461 for firms without. Additionally, the Total CEO delta averages $36,234 per unit of stock price change for firms with VC directors on the compensation committee and $17,637 for firms without. Table 2 also provides summary statistics for the key control variables. On average, firms with VC

directors on the compensation committee have larger size, higher leverage, higher R&D intensity, younger age, lower profitability, and lower institutional ownership concentration.[3] Moreover, in Panel B, we can see that the firms with VC directors on the compensation committee have more board members and a greater percentage of independent directors.

At the director level, VC directors are, on average, three years younger and have significantly shorter (5.90 vs. 10.22 years) tenure than non-VC directors. They are also more likely to sit on multiple boards than non-VC directors. Overall, they represent about 0.5% of the pool of corporate directors in the sample. This fraction is significantly below the 4.7% documented in Celikyurt et al. (2014) in large part because we have a more conservative sampling of VC-directors that excludes VC-backed firms and excludes coincidental directors (as explained in Section 4.9 below.)

[Insert Table 2 about here]

4. Empirical Results

To explore the impact of VC directors on a firm's compensation policy, we first investigate whether VC directors affect CEO compensation incentives. Then, to more accurately examine the effect of VC directors on mature listed companies, we exclude VC-backed firms at their IPO stage in our regression analysis. The results using the total sample are similar and consistent with the results presented in the paper and are available upon request.

4.1. Baseline regression results

4.1.1. VC directors and CEO risk-taking incentives

We first estimate the impact of VC directors on CEO risk-taking incentives (vega). Notably, we estimate a panel regression shown as equation (1) in which the dependent variable is the natural logarithm of CEO vega for firm *i* in year *t+1*. The primary variables of interest are the VC directors

[3] In the unreported summary statistics of our full sample, 18% of firms are VC-backed at the time of their IPOs. VC-backed IPOs account for 31% of firms with VC directors on the compensation committee, and 18% of firms without.

on the compensation committee dummy, the number of VC directors on the compensation committee, or the percentage of VC directors on the compensation committee for firm *i* in year *t*. In addition, we control for several other determinants of executive compensation, including size, leverage, market-to-book ratio, ROA, research and development intensity, tangibility, stock return, stock volatility, firm age, CEO age, CEO tenure, CEO duality, independent board, board size, institutional ownership concentration, and total institutional ownership (Coles, Daniel, and Naveen, 2006; Hayes, Lemmon, and Qiu, 2012). Furthermore, we follow the prior literature (Celikyurt et al., 2014; Güner, Malmendier, and Tate, 2008; Hochberg, 2012) to include industry (Fama-French 48) fixed effects and year fixed effects to address the possibility that there are other omitted variables.[4] Finally, following Celikyurt et al. (2014), we also include state-level controls (educational attainment, per capita income, and per capita R&D expense) or state fixed effects where a firm is headquartered to account for the possibility that high managerial incentive firms and VC firms cluster in the same geographical areas. Throughout the study, all associated t-statistics are computed based on standard errors clustered at the firm level.

$$log\ (CEO\ Vega)_{i,t+1} = \alpha + \beta * VC\ Directorship_{i,t} + Controls_{i,t} + \gamma * Year\ dummies + \delta * Industry\ dummies + \varepsilon_{i,t} \quad (1)$$

Table 3 presents the regression results of equation (1). Column (1) reports that the coefficient of VC directors on the compensation committee dummy is 0.225 and statistically significant at the 1% level. This result indicates that CEOs in VC director firms receive higher risk-taking incentives than CEOs in non-VC director firms. In terms of economic magnitude, for a representative firm with CEO

[4] In our sample, the median of VC directors' tenure is 3 years (mean is 4.35 years), so it is difficult to produce consistent estimates using firm fixed effects, due to degrees of freedom per VC director being at most two, for half of the VC directors' sample. Moreover, when we require at least five years of tenure within sample to code VC director's presence, we obtain significant positive coefficient estimates of 1.014 (t=2.325, i.e., statistically significant at 5%) for vega and 0.958 (t=1.689, statistically significant at 10%) for delta if using the percent of VC directors on the compensation committee as the variable of interest. Additionally, after perusing the list of reasons to hire the VC-directors (from the DEF 14A disclosure) for all VC director cases in our sample, we do not find a mention of any specific reason for them to be hired for a particular firm characteristic or expertise related to such characteristic.

compensation held at the mean level of our sample, switching from a non-VC director firm to a VC director firm implies an increase in wealth-to-volatility sensitivity of approximately 23%. In column (2), the coefficient of the number of VC directors on the compensation committee is 0.225 and is significant at the 1% level. In column (3), the percentage of VC directors on the compensation committee is significantly positive (0.851) at the 1% level. In columns (4)-(6), we follow Celikyurt et al. (2014) and include state-level controls on educational attainment, per capita income, and per capita R&D expense. The results are similar in magnitude but even stronger. In columns (7)-(9), we use state fixed effects instead of state-level controls, and the results are again consistent. Our estimated coefficients are similar to those reported in earlier studies for other control variables. Firms with larger assets, market-to-book ratios, ROA, and R&D Intensity are associated with higher risk-taking incentives. These results show that the presence of VC directors on the compensation committee positively impacts CEO risk-taking incentives (vega). As controls, we include variables significant from prior literature (Coles, Daniel, and Naveen, 2006). As is standard in previous literature, we control for the CEO delta. The signs of the control variable coefficients for CEO tenure, firm sales, market-to-book ratio, book leverage, and R&D intensity are consistent with those in prior literature.

[Insert Table 3 about here]

4.1.2. VC directors and CEO pay-performance sensitivity

We perform a similar analysis for CEO pay-performance sensitivity (delta). Estimates of equation (2) contained in Table 4 are consistent with our prediction that CEO delta is positively associated with the presence of a VC director on the compensation committee.

$$log\ (CEO\ Delta)_{i,t+1} = \alpha + \beta * VC\ Directorship_{i,t} + Controls_{i,t} + \gamma * Year\ dummies + \delta * Industry\ dummies + \varepsilon_{i,t} \quad (2)$$

In terms of economic magnitude, for a representative firm with CEO compensation held at the mean level of our sample, switching from a non-VC director firm to a VC-director firm implies

an increase in the CEO wealth-to-price sensitivity by approximately 30%-31%, depending on control variables. Similar to Table 3, CEO delta results become stronger after adding state-level controls or state fixed effects. We also note that the coefficient estimates on the control variables are consistent with those in prior literature.

[Insert Table 4 about here]

However, is the impact of the VC director present only when they are part of the compensation committee? To test this, we explore whether having VC directors on other committees has a similar impact. Table 5 reports the effect of VC directors outside the compensation committee--such as on the audit, governance, or nomination committee--on the CEO vega and delta. All the coefficients of non-compensation VC directorship are insignificant, implying that the VC director effect on compensation is exclusively achieved through their compensation committee membership. Of note is that in columns (1) and (5) we see that the VC directors who do not have a compensation committee membership have no impact on the CEO vega and delta. These results further confirm that the major impact of VC directors on managerial incentives is through compensation contracts.

[Insert Table 5 about here]

4.2. The impact of VC reputation on CEO vega and CEO delta

It has been widely documented that VC reputation is an essential influence on VC investment. IPOs backed by more reputable VC firms are more likely to exit successfully, access the public market faster, and have better post-IPO firm performance. More reputable VCs also engage more in the corporate governance of their portfolio companies and have higher monitoring ability (Nahata, 2008; Krishnan et al. 2011; Chemmanur, Krishnan, and Nandy, 2011; among others). Therefore, we hypothesize that VC directors from more reputable VC firms have a stronger impact on CEO incentives. We examine this hypothesis using equation (3), where the variables of interest are the interaction terms between the *High VC Reputation* dummy variable and VC directorship variables. To

measure VC reputation, we assign a VC firm as a high reputation VC if its Lee-Pollock-Jin (2011) VC reputation index is 70 or higher.[5] Since the index is only available until 2010, we assign the 2010 index value to all following years.

$$log\ (CEO\ Vega\ or\ Delta)_{i,t+1} = \alpha + \beta_1 * High\ VC\ Reputation_{i,t} * VC\ Directorship_{i,t} + \beta_2 * VC\ Directorship_{i,t} + \beta_3 * High\ VC\ Reputation_{i,t} + Controls_{i,t} + \gamma * Year\ dummies + \delta * Industry\ dummies + \varepsilon_{i,t} \quad (3)$$

[Insert Table 6 about here]

We present the VC reputation results in Table 6. In Panel A columns (3)-(9) the unconditional effect of VC director's compensation committee membership is significant. The interaction term between *High VC Reputation* and VC directorship variables are all significant at a 1% level across different specifications in models (1)-(9). Taking column (1), for example, a VC director from a reputable VC firm will increase the CEO vega by 70% compared with a VC director from a non-reputable VC firm. Similarly, in Panel B, the impact of VC reputation on CEO delta is also highly significant. For example, in column (1), the increase of CEO delta is 104% higher in a firm with highly reputable VC directors than in a firm without. These findings are consistent with the prior literature and add new evidence that high reputation VCs are more involved in the corporate governance of non-VC-backed mature firms. Moreover, they show that VC directors' affiliation with higher reputation VCs has stronger effects on the CEO incentives such directors implement.

4.3. Cross-Sectional heterogeneity of VC directors' impact on executive compensation

Table 7 explores heterogeneity in the effect of VC directors on executive compensation. We consider variation in a series of factors that are correlated with directors' roles in the firm, such as

[5] We thank Professor Pollock for providing access to his data at https://www.timothypollock.com/vc-reputation-index.

corporate governance, institutional ownership, independent directors, number of business segments, and the extent of CEO power.

Specifically, we test whether the magnitude of the VC directors' effect on CEO incentives varies depending on the E index (Bebchuk, Cohen, and Ferrell, 2009), institutional ownership (He, Huang, and Zhao, 2019), CEO pay slice (Bebchuk, Cremers, and Peyer, 2011), CEO age, number of business segments (Jiraporn et al., 2006), and independent board members (Knyazeva, Knyazeva, and Masulis, 2013). We categorize all firms into groups either below or above the median of the abovementioned factors by year and report the results in Table 7. In models (1) and (2) of both panels, we find that the VC directors' impact on CEO vega and delta is more pronounced for firms with a lower E index, indicating that VC directors install stronger CEO risk-taking incentives in better-governed non-VC backed firms. This is consistent with the findings in Hochberg (2012) that public firms backed by VCs have better governance that enhances the reputation of the sponsor VC. In models (3) and (4), we find that VC directors' impact on CEO incentives is stronger if firms have higher institutional ownership. One interpretation of this finding is that institutional investors value the opinions of VC directors in their voting decisions. In terms of CEO pay slice, which is defined as the proportion of the CEO total compensation in the total compensation of the top five highest-paid executives, a lower pay slice implies a lower ability of the CEO to extract rents, thus indicating better governance quality. Consistent with Hochberg (2012) therefore, the results from models (5) and (6) show that VC directors' impact is stronger when the CEO pay slice is lower. This is also consistent with the Bebchuk, Cremers, and Peyer (2011) finding that firms with lower CEO pay slice have better performance. Other results show that VC directors have a more substantial impact on CEO vega and delta in firms with younger CEO age, fewer business segments, and a lower percentage of independent board members.

[Insert Table 7 about here]

4.4. VC directors and the level of CEO compensation

Other than examining CEO vega and delta, we also explore the impact of VC directors on various CEO compensation components, including total compensation, excess compensation, cash pay, stock pay, option pay, inside debt, and termination pay. In Table 8, we document that the firms with VC directors on the compensation committee, on average, change CEO compensation by increasing the level of excess compensation, total compensation, and option compensation.[6] The increase in total and excess compensation is consistent with the prior observation that VC-director firms are also larger ones.

[Insert Table 8 about here]

4.5. VC directors and CEO performance goals

To explore how VC directors influence CEO incentives, we investigate the performance goals of CEO equity grants. First, we collect all the CEO equity grants' absolute and relative performance goals from the ISS Incentive Lab dataset. A grant can have one or more performance goals, and each performance goal can have one or more measurement periods. Second, we categorize all performance goals into three groups based on goal metrics. Group one are profitability metrics, including "EPS", "EBITDA", "earnings", "ROIC", "ROE", "EBT", "profit margin", "EBIT", "FFO" (funds from operations), "EVA", "ROA", "net income", "ROI", "NOI", "gross profit", "ROC", "ROS", or "cost reduction"; group two are growth metrics, including "sales", "operating income", "cashflow", "gross revenues", "same store sales", "IPO of subsidiary", "book value", "sales contracts", or "working capital"; and group three are stock market-based metrics, including "stock price" and "total shareholder returns" (TSR); all other metrics go to the unassigned group.[7] Notably, for all three groups, we include both the level and the growth of the relevant metrics (e.g., we include in group two

[6] When we examine option pay using pre-2006 and post-2006 (including 2006) subsamples, option pay is more significant in pre-2006 subsamples.
[7] See Appendix D for the distribution and categorization of absolute and relative performance goals.

sales level and sales growth as performance goals). Third, we construct a grant-level sample, and define three goal groups' indicators as one if a grant has at least one performance goal with a metric in the respective group in a given fiscal period, and zero otherwise.

In Table 9 Panel A, Part I, we use the grant-level sample and regress the goal group indicators on the VC directorship variables. Since our grant goals panel could include more than one grant per firm, we include CEO fixed effects instead of industry fixed effects. We further include a year fixed effect. Firms with VC directors on the compensation committees are more likely to use growth goals and are less likely to set profitability or market-based goals. These findings are consistent with Puri and Zarutskie (2012), who show that the critical firm characteristic on which VCs focus is scale or potential for scale, rather than short-term profitability. When we look at individual goals (instead of groups of goals), we confirm that VC director focuses exclusively on "sales" goals. Importantly, in comparing profitability and growth goals alone, we find that VC directors do not trade these goals off (i.e., there is no substitution of greater growth goals' likelihood for lower profitability goals' likelihood). These findings are further confirmed in Panel A, Part II, whereby we relate the principal component of the top three (in numerosity) growth goals (sales, operating income, and cash flows) and the top three profitability goals (EPS, earnings and EBITDA) goals. Our results are confirmed and also statistically stronger, as expected, given that the principal component per goal group can capture the common components within each group.

In Panel B, we investigate the likelihood of VC directors using absolute and relative performance goals. *Absolute Goals* is defined as one if a grant has at least one absolute performance goal, and zero otherwise. *Relative Goals* is defined as one if a grant has at least one relative performance goal, and zero otherwise. In models (1)-(6), we include all the grants, and we find that VC directors tend to stay away from relative goals. In models (7)-(9), we remove the grants with both absolute and relative performance goals, and we find that when choosing between absolute and relative goals, VC

directors are more likely to use absolute goals. These results suggest that VC directors are more likely to use absolute rather than relative performance goals, therefore making the CEO bear the industry risk consistent with VC compensation practices for startups with founders bearing the firm's idiosyncratic risk.[8]

[Insert Table 9 about here]

4.6. Addressing endogeneity concerns

4.6.1. Instrument variable analysis

Most corporate decisions are nonrandom. In our context, VC directors on the compensation committee may be elected by the firms that decide to improve CEO compensation, and the CEO network might influence firm's compensation decision. To control for such potential endogeneity issues, we employ three groups of instruments in the 2SLS model and the dynamic GMM model.

The first group of instruments is firm-year level indicators of whether there are direct flights from a company's headquarters location to the two main VC hub cities - San Francisco and Boston (Giroud, 2013; Bernstein, Giroud, and Townsend, 2016). The rationale for using direct flight indicators is that venture capitalists can reduce travel time and thus have lower monitoring costs if there are direct flights available between VC firms' locations and company headquarters' locations, and therefore companies are more likely to have VC directors on board. Moreover, the availability of direct flights does not directly affect companies' compensation design. To construct such indicators, first, we collect the zip code data of all US domestic airports from the Federal Aviation Administration (FAA) website. Second, for each company's headquarter, we list all airports within 50 miles of the headquarters location by zip code match and then select the top five home airports by traffic. Third,

[8] We also examine whether VC directors selectively pick peer group companies (Bizjak, Lemmon and Ngyuen, 2011). We do not find such evidence using peer group data for benchmark compensation comparisons or peer group data for relative performance goals. However, using annual industry peer groups, we do find that firms with VC directors are of larger size as compared to peers.

we use the form T-100 aviation segment data collected from the Bureau of Transportation Statistics (BTS) website and get the direct flights with the origin (destination) being one of the headquarter's home airports and the destination (origin) being San Francisco or Boston. For any firm-year, we define the direct flight indicator as one if there are direct flights in all twelve months in a year, both from a home airport to a hub city and from a hub city to a home airport, and zero otherwise. If a company's headquarters is within driving distance (100 miles) of the two hub cities[9], we create two driving distance indicators and assign them the value of one, respectively.

The second group of instruments is based on the industry-year level VC dry powder, which is the investible but un-invested VC capital within a given industry year (Aggarwal et al. 2022). We posit that the dry powder captures the opportunity cost of VC experts. Suppose there is more committed capital to invest in an industry, a VC expert may have a higher opportunity cost to join a board of a non-portfolio firm than spending time and effort on advising and monitoring portfolio companies.

We note that the dry powder may be correlated with compensation incentives on the industry-year level; therefore, we create an alternative instrument, the location-year level supply of VC executives. To construct such an instrument, we first collect the VC executives data from VentureXpert, and match VC executives to the portfolio companies their firm invests in. Next, we count the unique number of VC executives[10] who have invested in a portfolio company over the past five years. Finally, we count the total number of unique VC executives who have invested in a portfolio company headquartered within 30 miles of a Compustat company's headquarters location and use this as a proxy for VC expert supply.

[9] We calculate the distance between a company's headquarters' zipcode and the zipcode of the US Postal Service main office in a hub city.

[10] There are 431 job titles in the VentureXpert executives database, and among those we only consider 140 job titles. The top five titles we consider include Managing Director, Principal, General Partner, Managing Partner, and Co-Founder, and those observations account for 71% of the sample we select; full details of the list are available upon request.

In Panel A of Table 10, we report the 2SLS analysis main results for both vega and delta. In the first stage, we regress the endogenous VC directorship variables on a group of instruments, including direct flight indicator from/to San Francisco, direct flight indicator from/to Boston, VC dry power, VC dry powder squared, and driving distance indicators to San Francisco and Boston. In the second stage, we regress CEO vega or delta on estimated VC directorship variables together with the baseline and state-level controls. The second stage results are consistent with our baseline results in Tables 3 and 4. The Cragg-Donald F-stats indicate that our instruments pass the weak instrument test. The Kleibergen-Paap p-values show that the models are not under-identified.

In Panel A, we produce non-robust Sargan tests of overidentification. We note that all six tests are over-identified, and discover that the overidentification is due to the indicator for a direct flight to and from San Francisco to the headquarters of the firm in focus. This implies that firms in locations with direct flights to San Francisco not only tend to have a greater supply of VC directors but also that such firms tend to have higher vegas to start with. To evaluate if the system is overidentified, we remove the direct flight to San Francisco indicator and re-estimate. To be able to estimate a robust Sargan test, it is required that we remove clustering. The Sargan test results using the non-clustered standard errors are reported in the last row of Panel A. Our results (unreported) are unchanged, and all Sargan tests indicate no overidentification.

In Panel B, for robustness, we replace industry fixed effects with firm fixed effects. An instrumented VC director variable has greater variability due to the use of predetermined control variables that are firm-specific. It thus allows us to examine the impact of VC directors using firm fixed effects. Our results survive after adding firm fixed effects, especially for CEO vega.

Next, we notice that in the first stage, the coefficient of VC dry powder is significantly negative, and the coefficient of VC dry powder squared is significantly positive. The first result is consistent with our expectation that VC dry powder may capture the opportunity cost of VC experts. The second

result indicates that VC experts are more likely to be on board only if the investor interest in this industry (i.e., annual dry powder) is extremely high.

In Panel C of Table 10, we continue the IV analysis with a dynamic GMM model.[11] The coefficients of VC directorship variables across the various specifications are consistently positive, and mostly statistically significant. If our instruments are valid, this indicates that our main result is robust to incorporating simultaneous dynamic endogeneity and unobservable heterogeneity.

For robustness, in Appendix E, we present the 2SLS results using the alternative instrument, location-year supply of VC executives. We start with the model whereby VC dry powder and VC dry powder squared in Panel A of Table 10 are replaced by the VC executives supply. We find that the results are robust for CEO vega, and the models are not over-identified even with clustering.[12] Next, we add back the dry powder and dry powder squared to the first stage and find significant results for both CEO vega and CEO delta. Finally, we tabulate the second set of results in Appendix E. In Panel B of Appendix F, we also show that our results hold if applying the alternative instruments to the GMM model.

To confirm our results on performance goals presented in section 4.5 are robust to potential endogeneity concerns, we apply the IV analysis framework to examine the likelihood of VC directors utilizing growth oriented performance goals as opposed to profitability or market oriented goals. In unreported results, we employ a group of instruments[13] and find evidence that our findings documented in section 4.5 hold for IV analysis. The Sargan p-value of all models is above 0.30, indicating that the models are not over-identified. However, we note that F-stats for excluded

[11] Appendix F Panel A shows the first stage results of the main GMM model. The instruments we employ here include the direct flight indicator from/to San Francisco, the direct flight indicator from/to Boston, VC dry powder squared, and the minimum distance from company headquarter to any of the top 50 VC cities in the US.
[12] The t-values of the coefficients in the second stage range from 1.69 to 1.71 for vega, and from 1.45 to 1.58 for delta; the the Sargan p-values range from 0.31 to 0.55. Detailed results are available upon request.
[13] In addition to the main instruments reported in Panel A, we also include the minimum distance to top 50 VC cities, VC firm density by state, VC-backed company density by state, VC firm density by metropolitan statistical area (MSA), and VC-backed company density by MSA.

instruments are below 1.0, and Cragg-Donald F-statistics are below 3.0, indicating that the evidence is relatively weak.

[Insert Table 10 about here]

4.6.2. Heckman selection model analysis

To control for potential self-selection bias, we follow Campa and Kedia (2002) to employ a two-stage Heckman (1979) selection model using the maximum likelihood estimates. In Table 11, we employ the same instruments used in the primary IV analysis. These results are consistent with our baseline results and thus can mitigate self-selection concerns.

[Insert Table 11 about here]

4.6.3. Matched sample analysis

Next, we employ the propensity score matching (PSM) method, which has become a standard and commonly employed methodology for making causal inferences using observational data that are not produced by controlled experimental settings (e.g., Rosenbaum and Rubin, 1983, 1984). In our setting, we use the firms with VC directors on board as treated firms. We match the treated and control firms based on the fiscal year, industry, firm size, CEO vega at time t-1, CEO delta at time t-1, and further control variables[14]. The purpose is to broadly control for firm characteristics and other unobservable factors that may affect the possibility of appointing a VC director. We show in Appendix G that the treated and control groups are indistinguishable along most of the observable control variables particularly the lag CEO vega and the lag CEO delta.

Table 12 reports the panel data estimates using the matched sample. Our findings align with those obtained in the baseline panel regressions. Taking column (1) in Panels A and B, for example, the presence of VC directors on the compensation committee increases CEO vega (delta) by 21%

[14] Other controls in the PSM procedure include leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, and firm age.

(30%). We also note that the results are robust to a battery of fixed effects and controls. For example, in columns (1)-(3) we repeat our main specifications from Table 3 models (1)-(3) with industry and year fixed effects and baseline and no state-level controls. In columns (4)-(6) we include the state controls and in columns (7)-(9) we exclude state controls and include state fixed effects. Overall, our results are consistent across all specifications and are particularly increased in significance when we add controls for state fixed effects. The robust results suggest that the non-random assignment of VC directors to the compensation committee does not explain our findings.

[Insert Table 12 about here]

4.7. The impact of VC directors on corporate innovation

By examining the board appointments of VC directors on mature public firms, Celikyurt et al. (2014) illustrate that VCs play a broader role than just providing finance, monitoring, and advice for small private firms. In particular, they document that VC directors serving on the board of mature public firms promote corporate innovation, which is measured by R&D intensity and innovation outputs. We argue that such impact can be partly explained by increased CEO risk-taking incentives instilled by VC directors. We use the specification in equation (4) to examine the effect of the interaction between the VC director indicator and CEO vega or delta. The dependent variable is R&D intensity or an innovation outcome measure based on patenting activity. Following Celikyurt et al. (2014), we control for size, leverage, market-to-book ratio, ROA, intangible assets, firm age, board size, and Tobin's Q. If VC directors influence corporate innovation partly through increasing CEO incentives, the interaction term between the VC director indicator and CEO vega or delta should be positive and significant.

$$Innovation\ Measures_{i,t+1} = \alpha + \beta_1 * VC\ Director\ on\ Comp.Committee_{i,t} * log(CEO\ Vega\ or\ Delta)_{i,t} + \beta_2 * VC\ Director\ on\ Comp.Committee_{i,t} + \beta_3 *$$

$$log(CEO\ Vega\ or\ Delta)_{i,t} + Controls_{i,t} + \gamma * Year\ dummies + \delta * Industry\ dummies + \varepsilon_{i,t} \quad (4)$$

First, in Table 13, we present the results of R&D intensity, which is calculated as R&D expense scaled by total assets. The interaction terms of VC director's dummy and CEO vega or delta are significantly positive at the 5% level, indicating that the positive impact of VC directors on R&D intensity is stronger when CEOs have higher incentives.

[Insert Table 13 about here]

Next, we examine the impact of VC directors on several innovation output measures. The *Patent Count* is the number of patents that a firm files in year *t+1*. The *Forward Five-year Citations* is the sum of citations from year *t+1* to year *t+5* after a patent is filed. The *Innovation Value* (real and nominal) is the innovation's economic value in year t+1 developed by Kogan et al. (2017). The *Forward Five-year Innovation Value* (real and nominal) is the sum of innovation's economic value from year *t+1* to year *t+5*. The data on patents, citations, and innovation value are collected from Kogan et al. (2017)[15] and the PatentView website.[16] Because corporate R&D investment takes years to generate innovation outcomes, we use the lagged CEO vega to investigate the impact of CEO incentives on innovation output. Specifically, the lagged CEO vega is calculated as the average of CEO vega from year t-3 to year t-1. Following Celikyurt et al. (2014), we employ the Tobit models to account for the truncation bias in the patent data. Following Hall, Jaffe, and Trajtenberg (2001), all measures are adjusted for year and industry to correct for truncation in the patent data. For example, the number of patents is adjusted by dividing the number of patents obtained by firm *i* in year *t* by the mean number of patents in the same industry-year cohort to which firm *i* belongs. Similar adjustments are made for all other output measures.

[15] Data available at https://github.com/KPSS2017/Technological-Innovation-Resource-Allocation-and-Growth-Extended-Data.

[16] PatentView website provides the patent citation data by year.

[Insert Table 14 about here]

The results presented in Table 14 show that the interaction term is statistically significant in five out of six measures in both panels. For example, compared to a firm without VC directors, a firm with VC directors has more patents issued per year, and a significant portion of this increase is through stronger CEO incentives. Similarly, the real economic value of innovation increases if a firm has VC directors, and a significant portion of this increase comes through higher CEO vega and delta. These results further confirm that the impact of VC directors on corporate innovation is stronger when CEOs have higher incentives. Therefore, higher risk-taking incentives are one possible channel through which VC directors influence corporate innovation in mature public firms. In passing, we remark that the controls in Table 14 exclude R&D intensity, annual stock return and annual stock volatility, CEO age, CEO tenure, CEO duality, percent of independent board members, institutional ownership concentration and institutional ownership total, as well as CEO delta.

In unreported results, we also examine how the interaction of VC directorship and CEO performance goals affects R&D intensity. We find weak evidence that R&D intensity tends to be stronger if VC directors utilize growth performance goals, as opposed to profitability or market-oriented goals.[17]

4.8. The impact of VC directors on CEO forced turnover

To further explore the presence of VC directors on corporate governance, we examine whether the likelihood of forced CEO turnover is higher if firms have VC board members. We collect the forced CEO turnover data from Professor Florian Peters' website.[18] Given that CEO forced turnovers are more likely to happen during a bad performance period (Peters and Wagner, 2014, Jenter and Kanaan, 2015), we interact the VC director dummy variables with the abnormal stock return, as

[17] The t-values of the interaction terms are 1.28, 1.19, and 1.18 for the three VC directorship variables, respectively. Detailed results are available upon request.
[18] We thank Professor Peters for providing access to his data at https://www.florianpeters.org/data/.

shown in equation (5). *Abnormal return* is the industry and year adjusted excess return calculated by subtracting the S&P 500 annual return from the annual stock raw return. Rather than focusing on the compensation committee, we examine how VC directors impact the nomination and/or governance committees.

$$CEO\ Forced\ Turnover_{i,t} = \alpha + \beta_1 * VC\ Directorship_{i,t} * Abnormal\ Return_{i,t} + \beta_2 * VC\ Directorship_{i,t} + \beta_3 * Abnormal\ Return_{i,t} + Controls_{i,t} + \gamma * Year\ dummies + \delta * Industry\ dummies + \varepsilon_{i,t} \quad (5)$$

[Insert Table 15 about here]

Results from equation (5) are presented in Table 15. Having VC directors on the nomination and/or governance committee is associated with a higher possibility of forced CEO turnover when firms have bad stock performance. Economically, compared with a firm without VC directors on the nomination and/or governance committee, a firm having such directors is 5% more likely to have a forced CEO turnover conditional on abnormal performance. These findings further confirm that VCs provide monitoring to mature public firms and facilitate their corporate governance.

4.9. Robustness checks

An important difference between Celikyurt et al. (2014) and our paper is that we define VC directors as those who have VC experience *before* they are appointed as directors. In contrast, ordinary directors who, at some point in time during their tenure with the company, acquire affiliation with a VC firm are not considered as VC directors in our analysis. We define those as "coincidental" VC directors. Coincidental VC directors do not convey the same concept, and therefore, we expect no effect from those VC directors on executive compensation.

In Table 16, we show the placebo tests of our baseline regressions if 1) only coincidental VC directors are included in the analysis, and 2) if both coincidental VC directors and the VC directors with prior VC experience are included. We find that the effect only comes through VC directors who

have prior VC experience, indicating that the impact of VC directors on CEO incentives is indeed through their VC expertise, rather than their coincidental VC affiliation.

[Insert Table 16 about here]

To that matter, we remark further that our sampling of VC directorships differs materially from Celikyurt et al. (2014). First, we exclude in our tests VC-backed firms as the VC directorships in such firms may be a consequence of the VC sponsorship in its early life. Second, we exclude any VC directors that are coincidental, acquiring a VC affiliation after the public firm's board membership start date. Our conservative approach causes a substantial reduction in the number of unique firms with VC directors in our regression sample (i.e., 104). Therefore, we verify that our results are consistent when we include coincidental directors and when we include VC-backed firms in line with Celikyurt et al. (2014). For example, when we include VC-backed firms, and non-coincidental directors exclusively, the number of unique firms with VC directors is raised to 147. The results are in the Appendix C Panels A and B and consistent with our main specifications. Taking model (1) for example, CEO vega (delta) increases by 18% (21%) if a firm has a VC director on the compensation committee. Similarly, when we include both coincidental and non-coincidental VC directors in non-VC-backed firms, the number of unique firms with VC directors is raised to 234, and the results are again consistent with the main specifications. As presented in Appendix C Panels C and D, CEO vega (delta) increases by 13% (16%) if a firm has a VC director on the compensation committee. Lastly, when we include both (i) VC-backed and non-VC-backed firms, and (ii) coincidental and non-coincidental VC directors, there are in total 395 unique firms with VC directors. The results are presented in the Appendix C Panels E and F and are consistent with our main findings. CEO vega (delta) increases by 11% (15%) if a firm has a VC director on the compensation committee.

In addition, to control for potential venture capital ownership in non-VC-backed firms, we extract beneficial ownership information from DEF14A filings and create an indicator equaling one

if at least one beneficial owner is a venture capital. In unreported results, we confirm that adding this additional control variable does not alter our baseline results.

To explore whether certain qualifications of VC directors have more pronounced impact on CEO incentives, we extract the director introduction section from proxy statements for all VC directors and manually check their qualification descriptions. We are particularly interested in two types of qualifications – technology related and strategic related. We create an indicator for each type and interact them with the VC directorship measures in our baseline model. However, the interaction terms in the regressions are not statistically significant, indicating that technology or strategy experience do not appear to be influential to CEO incentives.

5. Conclusions

We analyze how VC directors affect the executive compensation policies of mature public firms. Our results indicate that firms with VC directors on the compensation committee are more likely to increase CEO risk-taking incentives and pay-performance sensitivity. On average, having one or more VC directors on the compensation committee increases the CEO vega by 23% and increases CEO delta by 30%. Such effects are more pronounced if directors are from highly reputable VC firms. The increase in CEO vega and delta is more significant when firms have better governance, higher institutional ownership, a higher CEO pay slice, fewer business segments, and a lower percentage of independent board members. The mechanism by which VC directors influence CEO incentives is to emphasize growth rather than profitability performance goals and use absolute performance goals more frequently than relative goals. The increased CEO incentives – in the presence of VC director(s) – also lead to increased corporate innovation, which is a possible channel to explain the results in Celikyurt et al. (2014). In addition, the positive impact of VC directors on corporate governance is confirmed by the higher likelihood of forced CEO turnover when VC directors are on board.

Our work contributes to the literature on the effect of director experience on corporate policy. Several fruitful avenues exist for future research. One would be to consider the value of VC directors in other settings, such as securities offerings that require helps from venture capitalist.

References

Adams, R. B., Ferreira, D. (2007). A theory of friendly boards. *Journal of Finance*, 62(1), 217-250.

Admati, A. R., Pfleiderer, P. (1994). Robust financial contracting and the role of venture capitalists. *Journal of Finance*, 49(2), 371-402.

Aggarwal, D., Eldar, O., Hochberg, Y., Litov, L. (2022). The rise of dual-class stock IPOs, *Journal of Financial Economics*, forthcoming.

Angbazo, L., Narayanan, R. (1997). Top management compensation and the structure of the board of directors in commercial banks. *Review of Finance*, 1(2), 239-259.

Armstrong, C. S., Vashishtha, R. (2012). Executive stock options, differential risk-taking incentives, and firm value. *Journal of Financial Economics*, 104(1), 70-88.

Baker, M. P., Gompers, P. A. (1999). Executive ownership and control in newly public firms: the role of venture capitalists. Harvard Business School Working Paper.

Barry, C. B., Muscarella, C. J., Peavy Iii, J. W., 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., Cohen, A., and Ferrell, A. (2009). What matters in corporate governance? *Review of Financial Studies*, 22(2), 783-827.

Bebchuk, L., Cremers, M., and Peyer. U. (2011). The CEO pay slice. *Journal of Financial Economics*, 102(1), 199-221.

Bengtsson, O., Hand, J. R. (2011). CEO compensation in venture-backed firms. *Journal of Business Venturing*, 26(4), 391-411.

Bernstein, S., Giroud, X., Townsend, R. R. (2016). The impact of venture capital monitoring. *Journal of Finance*, 71(4), 1591-1622.

Bertrand, M., Mullainathan, S. (2001). Are CEOs rewarded for luck? The ones without principals are. *The Quarterly Journal of Economics*, 116(3), 901-932.

Bizjak, J., Lemmon, M., Nguyen, T. (2011). Are all CEOs above average? An empirical analysis of compensation peer groups and pay design. *Journal of Financial Economics*, 100(3), 538-555.

Bottazzi, L., Da Rin, M., Hellmann, T. (2008). Who are the active investors? Evidence from venture capital. *Journal of Financial Economics*, 89(3), 488-512.

Campa, J.M., and Kedia, S. (2002). Explaining the diversification discount. *Journal of Finance*, 57(4), 1731-1762

Celikyurt, U., Sevilir, M., Shivdasani, A. (2014). Venture capitalists on boards of mature public firms. *Review of Financial Studies*, 27(1), 56-101.

Chemmanur, T. J., Krishnan, K., Nandy, D. K. (2011). How does venture capital financing improve efficiency in private firms? A look beneath the surface. *Review of Financial Studies*, 24(12), 4037-4090.

Chhaochharia, V., Grinstein, Y. (2009). CEO compensation and board structure. *Journal of Finance*, 64(1), 231-261.

Coles, J. L., Daniel, N. D., Naveen, L. (2006). Managerial incentives and risk-taking. *Journal of Financial Economics*, 79(2), 431-468.

Core, J. E., Holthausen, R. W., Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics*, 51(3), 371-406.

Core, J., Guay, W. (1999). The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics*, 28(2), 151-184.

Cyert, R. M., Kang, S. H., Kumar, P. (2002). Corporate governance, takeovers, and top-management compensation: Theory and evidence. *Management Science*, 48(4), 453-469.

Dass, N., Kini, O., Nanda, V., Onal, B., Wang, J. (2014). Board expertise: Do directors from related industries help bridge the information gap? *Review of Financial Studies*, 27(5), 1533-1592.

DiNardo, J., Lee, D. S. (2004). Economic impacts of new unionization on private sector employers: 1984–2001. *Quarterly Journal of Economics*, 119(4), 1383-1441.

Edmans, A., Gabaix, X., Jenter, D. (2017). Executive compensation: A survey of theory and evidence. *The Handbook of the Economics of Corporate Governance* (Vol. 1, pp. 383-539). North-Holland.

Ewens, M., Nanda, R., Stanton, C. (2020). The evolution of CEO compensation in venture capital-backed startups. Harvard Business School Working paper.

Fama, E. F., Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics*, 26(2), 301-325.

Faleye, O., Hoitash, R., Hoitash, U. (2011). The costs of intense board monitoring. *Journal of Financial Economics*, 101(1), 160-181.

Giroud, X. (2013). Proximity and investment: Evidence from plant-level data. *The Quarterly Journal of Economics*, 128 (2), 861-915.

Goldman, E., Slezak, S. L. (2006). An equilibrium model of incentive contracts in the presence of information manipulation. *Journal of Financial Economics*, 80(3), 603-626.

Gompers, P. A. (1995). Optimal investment, monitoring, and the staging of venture capital. *Journal of Finance*, 50(5), 1461-1489.

Gompers, P. A., Ishii, J. L., Metrick, A. (2003). Corporate Governance and Equity Prices. *Quarterly Journal of Economics,* 118 (1), 107-156.

Gompers, P., & Lerner, J. (1999). An analysis of compensation in the US venture capital partnership. *Journal of Financial Economics*, 51(1), 3-44.

Gorman, M., Sahlman, W. A. (1989). What do venture capitalists do? *Journal of Business Venturing*, 4(4), 231-248.

Grinstein, Y., Hribar, P. (2004). CEO compensation and incentives: Evidence from M&A bonuses. *Journal of Financial Economics*, 73(1), 119-143.

Guay, W. R. (1999). The sensitivity of CEO wealth to equity risk: an analysis of the magnitude and determinants. *Journal of Financial Economics*, 53(1), 43-71.

Güner, A. B., Malmendier, U., Tate, G. (2008). Financial expertise of directors. *Journal of Financial Economics*, 88(2), 323-354.

Guthrie, K., Sokolowsky, J., Wan, K. M. (2012). CEO compensation and board structure revisited. *Journal of Finance*, 67(3), 1149-1168.

Hall, B. H., Jaffe, A. B., Trajtenberg, M. (2001). The NBER patent citations data file: Lessons, insights and methodological tools. NBER Working Paper.

Hall, B. J., Liebman, J. B. (1998). Are CEOs really paid like bureaucrats? *Quarterly Journal of Economics*, 113(3), 653-691.

Hall, B. J., Murphy, K. J. (2003). The trouble with stock options. *Journal of Economic Perspectives*, 17(3), 49-70.

Hallock, K. F. (1997). Reciprocally interlocking boards of directors and executive compensation. *Journal of Financial and Quantitative Analysis*, 32(3), 331-344.

Hart, O. (2001). Financial contracting. *Journal of Economic Literature*, 39(4), 1079-1100.

Hayes, R. M., Lemmon, M., Qiu, M. (2012). Stock options and managerial incentives for risk taking: Evidence from FAS 123R. *Journal of Financial Economics*, 105(1), 174-190.

He, J. J., Huang, J., Zhao, S. (2019). Internalizing governance externalities: The role of institutional cross-ownership. *Journal of Financial Economics*, 134 (2), 400-418.

Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica*, 153-161.

Hellmann, T. (2000). Contracting over Future Ownership Choices: IPOs, Acquisitions and Convertible Securities in Venture Capital. *Journal of Financial Economics*, 81, 649-679.

Hellmann, T., Puri, M. (2002). Venture capital and the professionalization of start-up firms: Empirical evidence. *Journal of Finance*, 57(1), 169-197.

Hermalin, B. E., Weisbach, M. S. (2003). Boards of directors as an endogenously determined institution: A survey of the economic literature. *Economic Policy Review*, 9(1).

Hochberg, Y.V. (2012). Venture capital and corporate governance in the newly public firm. *Review of Finance*, 16(2), 429-480.

Hsu, D. H. (2004). What do entrepreneurs pay for venture capital affiliation? *Journal of Finance*, 59(4), 1805-1844.

Jensen, M. C., Murphy, K. J. (1990). Performance pay and top-management incentives. *Journal of Political Economy*, 98(2), 225-264.

Jenter, D., Kanaan, F. (2015). CEO turnover and relative performance evaluation. *Journal of Finance,* 70(5), 2155-2184.

Jiraporn, P., Kim, Y. S., Davidson, W. N., Singh, M. (2006). Corporate governance, shareholder rights and firm diversification: An empirical analysis. *Journal of Banking & Finance*, 30(3), 947-963

Kaplan, S. N., Sensoy, B. A., Strömberg, P. (2009). Should investors bet on the jockey or the horse? Evidence from the evolution of firms from early business plans to public companies. *Journal of Finance*, 64(1), 75-115.

Kaplan, S. N., Strömberg, P. (2003). Financial contracting theory meets the real world: An empirical analysis of venture capital contracts. *Review of Economic Studies*, 70(2), 281-315.

Knyazeva, A., Knyazeva, D., Masulis, R. W. (2013). The supply of corporate directors and board independence. *Review of Financial Studies*, 26(6), 1561-1605.

Kogan, L., Papanikolaou, D., Seru, A., Stoffman, N. (2017). Technological innovation, resource allocation, and growth. *Quarterly Journal of Economics*, 132(2), 665-712.

Krishnan, C. N. V., Ivanov, V. I., Masulis, R. W., Singh, A. K. (2011) Venture capital reputation, post-IPO performance, and corporate governance. *Journal of Financial and Quantitative Analysis*, 46(5), 1295-1333.

Laux, C., Laux, V. (2009). Board committees, CEO compensation, and earnings management. *The Accounting Review*, 84(3), 869-891.

Lee, P.M., Pollock, T.G., Jin, K. (2011). The contingent value of venture capitalist reputation for entrepreneurial firms. *Strategic Organization*, 9(1), 33-69.

Lerner, J. (1995). Venture capitalists and the oversight of private firms. *Journal of Finance*, 50(1), 301-318.

Li, F., Srinivasan, S. (2011). Corporate governance when founders are directors. *Journal of Financial Economics*, 102(2), 454-469.

Low, A. (2009). Managerial risk-taking behavior and equity-based compensation. *Journal of Financial Economics*, 92(3), 470-490.

Lowry, M., Michaely, R., Volkova, E. (2017). Initial public offerings: A synthesis of the literature and directions for future research. *Foundations and Trends in Finance*.

Ma, S. (2020). The life cycle of corporate venture capital. *Review of Financial Studies*, 33(1), 358-394.

Megginson, W.L., Weiss, K.A. (1991). Venture capitalist certification in initial public offerings. *Journal of Finance,* 46(3), 879-903.

Mobbs, S. (2013). CEOs under fire: The effects of competition from inside directors on forced CEO turnover and CEO compensation. *Journal of Financial and Quantitative Analysis*, 48(3), 669-698.

Murphy, K. J. (1999). Executive compensation. *Handbook of Labor Economics*, 3, 2485-2563.

Nahata, R. (2008). Venture capital reputation and investment performance. *Journal of Financial Economics*, 90(2), 127-151.

Perry, T., Zenner, M. (2000). CEO compensation in the 1990's: Shareholder alignment or shareholder expropriation. *Wake Forest Law Review*, 35, 123.

Peters, F., Wagner, A. (2014). The executive turnover risk premium. *Journal of Finance,* 69(4), 1529-1563.

Puri, M., Zarutskie, R. (2012). On the life cycle dynamics of venture-capital-and non-venture-capital-financed firms. *Journal of Finance*, 67(6), 2247-2293.

Rajan, R. G. (1992). Insiders and outsiders: The choice between informed and arm's-length debt. *Journal of Finance*, 47(4), 1367-1400.

Rosenbaum, P. R., Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41-55.

Rosenbaum, P. R., Rubin, D. B. (1984). Reducing bias in observational studies using subclassification on the propensity score. *Journal of the American Statistical Association*, 79(387), 516-524.

Sørensen, M. (2007). How smart is smart money? A two-sided matching model of venture capital. *Journal of Finance*, 62(6), 2725-2762.

Thorburn, K. S. (1997). Comment on 'Top management compensation and the structure of the board of directors in commercial banks. *Review of Finance*, 1(2), 261-264.

Vafeas, N. (2003). Further evidence on compensation committee composition as a determinant of CEO compensation. *Financial Management*, 32(2), 53-70.

Wasserman, N. (2006). Stewards, agents, and the founder discount: Executive compensation in new ventures. *Academy of Management Journal*, 49(5), 960-976.

Wintoki, M. B., Linck, J. S., Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, 105(3), 581-606.

Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40(2), 185-211.

[dataset] Center for Research of Stock Prices (CRSP) at the University of Chicago Booth School of Business, accessed through Wharton Research Data Services, https://wrds-www.wharton.upenn.edu/

[dataset] CEO Forced Turnover Data by Florian Peters, https://www.florianpeters.org/data/

[dataset] Compustat-Capital IQ, Wharton Research Data Services, https://wrds-www.wharton.upenn.edu/

[dataset] Compustat-CRSP Merged Database, Wharton Research Data Services, https://wrds-www.wharton.upenn.edu/

[dataset] Entrenchment Index by Lucian Bebchuk, http://www.law.harvard.edu/faculty/bebchuk/data.shtml

[dataset] French, K., 2021, Data Library, https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[dataset] Institutional Shareholder Services (ISS), Wharton Research Data Services, https://wrds-www.wharton.upenn.edu/

[dataset] IPO Data by Jay R. Ritter https://site.warrington.ufl.edu/ritter/ipo-data/

[dataset] KPSS2017 Technological Innovation Resource Allocation and Growth Extended Data, https://github.com/KPSS2017/Technological-Innovation-Resource-Allocation-and-Growth-Extended-Data

[dataset] Lee-Pollock-Jin VC Reputation Index by Timothy G. Pollock, https://www.timothypollock.com/vc-reputation-index

[dataset] National Science Foundation, https://www.nsf.gov/

[dataset] PatentView, https://patentsview.org/

[dataset] Securities Data Corporation Platinum Initial Public Offerings Database, Thomson Reuters.

[dataset] Securities Data Corporation Platinum VentureXpert Database, Thomson Reuters.

[dataset] Thomson/Refinitiv, Wharton Research Data Services, https://wrds-www.wharton.upenn.edu/

[dataset] United States Bureau of Economic Analysis, https://www.bea.gov/

[dataset] United States Census Bureau, https://www.census.gov/

Table 1 – Sample distribution by year and industry

This table provides the summary statistics of the full sample (including firms that are VC-backed at their IPO stage) from 1998 to 2018. Panel A provides the sample distribution by fiscal year, and Panel B provides the sample distribution by the Fama-French 12 industries. See Appendix A for variable definitions.

Panel A: Distribution of observations by year

Year	Number of Observations	With VC Directors (%)	With VC directors on Compensation Committee (%)
1998	743	0.94	0.40
1999	715	1.40	0.70
2000	754	2.52	0.93
2001	799	3.75	2.00
2002	785	3.31	1.53
2003	788	4.06	2.41
2004	779	4.62	2.31
2005	756	3.97	1.98
2006	732	5.19	1.91
2007	795	4.40	1.76
2008	800	4.75	2.13
2009	806	5.09	2.23
2010	790	5.70	3.42
2011	793	5.17	3.15
2012	761	5.39	3.02
2013	785	5.73	3.06
2014	762	6.04	3.15
2015	765	6.01	2.61
2016	765	6.27	2.35
2017	760	6.97	3.42
2018	652	6.90	3.37
Total	16,085	4.68	2.28

Panel B: Distribution of observations by industry

Fama-French 12 Industry	Number of Firms	With VC Directors (%)	With VC directors on Compensation Committee (%)
Business Equipment	2520	6.67	2.74
Chemicals and Allied Products	841	4.16	0.83
Consumer Durables	643	2.18	1.09
Consumer Nondurables	1462	4.51	2.74
Healthcare, Medical Equipment, and Drugs	1319	5.08	2.81
Manufacturing	2960	4.19	2.40
Oil, Gas, and Coal	978	4.81	3.37
Other	2453	3.14	1.51
Telephone and Television Transmission	439	9.57	6.38
Wholesale, Retail, and Some Services	2470	4.53	1.54
Total	16,085	4.68	2.28

Table 2 - Summary statistics of the firm, board and director characteristics

This table provides the summary statistics of the firm, board, and director characteristics from 1998 to 2018 in Panel A and B, respectively. Column (10) presents the difference between column (8) and column (5). See Appendix A for variable definitions. The ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Firm Statistics

	All Sample			With VC Directors on Compensation Committee			Without VC Directors on Compensation Committee			Difference
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CEO Total Compensation (Logarithm)	16,074	8.19	1.01	367	8.69	0.80	15,707	8.18	1.01	-0.52***
CEO Vega (Logarithm)	11,064	2.88	1.60	247	3.55	1.37	10,817	2.86	1.60	-0.68***
CEO Delta (Logarithm)	11,064	2.88	1.60	247	3.59	1.44	10,817	2.87	1.60	-0.72***
Size (Logarithm)	16,085	7.71	1.50	367	8.33	1.35	15,718	7.69	1.50	-0.64***
Leverage	16,085	0.20	0.16	367	0.23	0.18	15,718	0.20	0.15	-0.03***
Market-to-Book Ratio	16,085	3.11	3.26	367	3.20	2.76	15,718	3.11	3.27	-0.09
ROA	16,085	0.05	0.09	367	0.04	0.09	15,718	0.05	0.09	0.01***
R&D Intensity	16,085	0.02	0.04	367	0.03	0.04	15,718	0.02	0.04	-0.01***
Tangibility	16,085	0.28	0.22	367	0.23	0.21	15,718	0.28	0.22	0.04***
Stock Return	16,085	0.13	0.44	367	0.13	0.44	15,718	0.13	0.44	0
Stock Volatility	16,085	0.39	0.18	367	0.37	0.16	15,718	0.39	0.18	0.02**
Firm Age (Logarithm)	16,085	2.74	0.83	367	2.61	0.95	15,718	2.74	0.83	0.13***
CEO Age (Logarithm)	16,085	4.04	0.12	367	4.04	0.11	15,718	4.04	0.12	0.01
CEO Tenure (Logarithm)	16,085	1.87	0.78	367	1.78	0.73	15,718	1.88	0.78	0.09**
CEO Duality	16,085	0.63	0.48	367	0.54	0.50	15,718	0.63	0.48	0.09***
Institutional Ownership Concentration	16,085	0.06	0.05	367	0.05	0.04	15,718	0.06	0.05	0.01**
Institutional Ownership Total	16,085	0.77	0.20	367	0.79	0.18	15,718	0.77	0.20	-0.02*
Patent Count	16,085	36.62	244.91	367	52.61	209.60	15,718	36.25	245.66	-16.37
Forward 5-yr Citations	16,085	100.82	1259.71	367	150.41	697.82	15,718	99.66	1269.85	-50.75
Innovation Value (Nominal)	16,085	560.47	2837.41	367	723.35	2507.79	15,718	556.66	2844.61	-166.68
Innovation Value (Real)	16,085	1209.81	5791.00	367	1662.98	5708.26	15,718	1199.23	5792.67	-463.75
CEO Forced Turnover	16,085	0.02	0.14	367	0.02	0.15	15,718	0.02	0.14	-0.01
High VC Reputation	16,085	0.00	0.05	367	0.02	0.14	15,718	0.00	0.04	-0.02***

Panel B: Board Statistics

	All Sample			With VC Directors on Compensation Committee			Without VC Directors on Compensation Committee			Difference
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Board Size	16,085	9.24	2.18	367	9.65	2.41	15,718	9.23	2.17	-0.41***
Number of VC Directors on Board	16,085	0.04	0.21	367	1.00	0.00	15,718	0.02	0.15	-0.98***
% VC Directors on Board	16,085	0.01	0.03	367	0.12	0.06	15,718	0.00	0.02	-0.12***
% Independent Directors on Board	16,085	0.74	0.16	367	0.76	0.14	15,718	0.74	0.16	-0.02***
Number of VC Directors on Compensation Committee	16,085	0.02	0.15	367	1.03	0.16	15,718	0.00	0.00	-1.03***
% VC Directors on Compensation Committee	16,085	0.01	0.04	367	0.28	0.10	15,718	0.00	0.00	-0.28***

Panel C: Director Statistics

	All Sample			VC Directors			Non-VC Directors			Difference
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age	267,196	61.29	8.46	1,261	58.65	8.46	265,935	61.30	8.46	2.65***
Tenure	267,143	10.20	7.76	1,259	5.90	3.88	265,884	10.22	7.77	4.32***
Multiple Boards	267,438	0.47	0.50	1,261	0.59	0.49	266,177	0.47	0.50	-0.12***
Number of Other Board Seats Held	267,324	0.83	1.11	1,261	1.07	1.13	266,063	0.83	1.11	-0.24***

Table 3 - The effect of the presence of VC director on the compensation committee on CEO risk-taking incentives (vega)

This table shows the effect of the presence of VC directors on the compensation committee on CEO risk-taking incentives (vega) using the non-VC-backed firm sample from 1998 to 2018. The dependent variable is the natural logarithm of CEO vega in year t+1. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	CEO Vega $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.225***			0.236***			0.234***		
	(2.643)			(2.725)			(2.817)		
Number of VC Directors on Comp. Committee		0.225***			0.236***			0.234***	
		(2.882)			(2.965)			(3.058)	
% VC Director on Comp. Committee			0.851***			0.877***			0.859***
			(3.567)			(3.589)			(3.596)
Size	0.321***	0.321***	0.320***	0.321***	0.321***	0.321***	0.328***	0.328***	0.327***
	(18.205)	(18.202)	(18.161)	(17.949)	(17.946)	(17.906)	(17.861)	(17.859)	(17.823)
Leverage	-0.363***	-0.364***	-0.364***	-0.362***	-0.363***	-0.363***	-0.390***	-0.391***	-0.391***
	(-3.427)	(-3.432)	(-3.435)	(-3.356)	(-3.361)	(-3.363)	(-3.574)	(-3.581)	(-3.583)
Market-to-Book Ratio	0.030***	0.030***	0.030***	0.030***	0.030***	0.030***	0.032***	0.032***	0.032***
	(4.978)	(4.979)	(4.988)	(4.819)	(4.821)	(4.828)	(5.110)	(5.111)	(5.118)
ROA	0.864***	0.865***	0.869***	0.854***	0.855***	0.859***	0.817***	0.818***	0.821***
	(4.698)	(4.704)	(4.720)	(4.597)	(4.603)	(4.618)	(4.381)	(4.386)	(4.401)
R&D Intensity	2.255***	2.258***	2.266***	2.304***	2.307***	2.317***	2.297***	2.299***	2.310***
	(5.214)	(5.219)	(5.237)	(5.250)	(5.256)	(5.275)	(4.950)	(4.953)	(4.975)
Tangibility	-0.099	-0.097	-0.095	-0.134	-0.132	-0.130	-0.143	-0.141	-0.139
	(-1.021)	(-0.999)	(-0.980)	(-1.384)	(-1.362)	(-1.344)	(-1.418)	(-1.395)	(-1.381)
Stock Return	-0.098***	-0.098***	-0.098***	-0.095***	-0.095***	-0.094***	-0.092***	-0.092***	-0.092***
	(-3.007)	(-3.007)	(-3.002)	(-2.871)	(-2.872)	(-2.866)	(-2.786)	(-2.787)	(-2.782)
Stock Volatility	-0.561***	-0.560***	-0.561***	-0.560***	-0.559***	-0.560***	-0.542***	-0.541***	-0.542***
	(-5.647)	(-5.639)	(-5.646)	(-5.606)	(-5.597)	(-5.604)	(-5.386)	(-5.378)	(-5.387)
Firm Age	0.014	0.015	0.015	0.016	0.016	0.017	0.010	0.010	0.011
	(0.854)	(0.871)	(0.908)	(0.919)	(0.937)	(0.974)	(0.586)	(0.605)	(0.642)
CEO Age	-0.284**	-0.284**	-0.282**	-0.271**	-0.270**	-0.269**	-0.297**	-0.296**	-0.294**
	(-2.301)	(-2.296)	(-2.279)	(-2.175)	(-2.169)	(-2.154)	(-2.366)	(-2.359)	(-2.344)

CEO Tenure	-0.022	-0.022	-0.022	-0.028	-0.029	-0.029	-0.022	-0.023	-0.023
	(-1.125)	(-1.127)	(-1.129)	(-1.426)	(-1.429)	(-1.430)	(-1.121)	(-1.123)	(-1.125)
CEO Duality	0.065**	0.064**	0.065**	0.061**	0.061**	0.062**	0.060**	0.060**	0.061**
	(2.236)	(2.230)	(2.243)	(2.121)	(2.114)	(2.130)	(2.061)	(2.054)	(2.072)
% Independent Board	0.512***	0.512***	0.513***	0.492***	0.492***	0.494***	0.481***	0.481***	0.483***
	(4.939)	(4.936)	(4.951)	(4.740)	(4.737)	(4.753)	(4.599)	(4.597)	(4.614)
Board Size	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
	(0.824)	(0.836)	(0.857)	(0.785)	(0.798)	(0.819)	(0.808)	(0.819)	(0.840)
Institutional Ownership Concentration	-0.725*	-0.723*	-0.716*	-0.800*	-0.798*	-0.792*	-0.764*	-0.763*	-0.757*
	(-1.742)	(-1.737)	(-1.721)	(-1.919)	(-1.914)	(-1.899)	(-1.845)	(-1.842)	(-1.829)
Institutional Ownership Total	0.266***	0.268***	0.268***	0.271***	0.273***	0.273***	0.293***	0.294***	0.294***
	(2.811)	(2.827)	(2.828)	(2.849)	(2.867)	(2.865)	(3.098)	(3.115)	(3.108)
Log(1+Delta)	0.376***	0.376***	0.376***	0.376***	0.375***	0.375***	0.370***	0.370***	0.370***
	(20.176)	(20.167)	(20.189)	(19.997)	(19.987)	(20.012)	(19.559)	(19.549)	(19.576)
State Educational Attainment				0.088	0.089	0.081			
				(0.577)	(0.578)	(0.525)			
State per-capita Income				-0.302	-0.305	-0.296			
				(-1.503)	(-1.516)	(-1.467)			
State R&D per Capita				0.022	0.022	0.022			
				(1.199)	(1.206)	(1.202)			
Observations	9,535	9,535	9,535	9,398	9,398	9,398	9,398	9,398	9,398
Adjusted R-squared	0.526	0.526	0.526	0.524	0.524	0.524	0.525	0.525	0.525
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Table 4 - The effect of the presence of VC director on the compensation committee on CEO pay-performance sensitivity (delta)

This table shows the effect of the presence of VC directors on the compensation committee on CEO pay-performance sensitivity (delta) using the non-VC-backed firm sample from 1998 to 2018. The dependent variable is the natural logarithm of CEO delta in year t+1. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	CEO Delta $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.301**			0.313**			0.306**		
	(2.313)			(2.394)			(2.473)		
Number of VC Directors on Comp. Committee		0.311**			0.323***			0.318***	
		(2.550)			(2.633)			(2.715)	
% VC Director on Comp. Committee			1.131***			1.158***			1.127***
			(3.195)			(3.233)			(3.283)
Size	0.491***	0.491***	0.490***	0.490***	0.490***	0.490***	0.495***	0.495***	0.495***
	(24.622)	(24.619)	(24.597)	(24.295)	(24.293)	(24.269)	(24.322)	(24.321)	(24.304)
Leverage	-0.473***	-0.474***	-0.474***	-0.471***	-0.472***	-0.472***	-0.538***	-0.539***	-0.539***
	(-3.199)	(-3.205)	(-3.208)	(-3.140)	(-3.147)	(-3.147)	(-3.562)	(-3.571)	(-3.572)
Market-to-Book Ratio	0.047***	0.047***	0.047***	0.047***	0.047***	0.047***	0.049***	0.049***	0.049***
	(5.748)	(5.749)	(5.756)	(5.581)	(5.583)	(5.588)	(5.916)	(5.917)	(5.921)
ROA	1.360***	1.362***	1.365***	1.353***	1.354***	1.358***	1.295***	1.296***	1.300***
	(6.029)	(6.035)	(6.049)	(5.942)	(5.948)	(5.961)	(5.696)	(5.702)	(5.715)
R&D Intensity	4.329***	4.330***	4.342***	4.385***	4.387***	4.400***	4.269***	4.269***	4.285***
	(6.720)	(6.723)	(6.740)	(6.703)	(6.706)	(6.725)	(6.214)	(6.215)	(6.239)
Tangibility	-0.178	-0.174	-0.172	-0.218	-0.214	-0.213	-0.221	-0.217	-0.216
	(-1.261)	(-1.238)	(-1.224)	(-1.558)	(-1.536)	(-1.522)	(-1.539)	(-1.516)	(-1.506)
Stock Return	0.075**	0.075**	0.075**	0.079**	0.079**	0.080**	0.077**	0.077**	0.077**
	(2.304)	(2.302)	(2.308)	(2.415)	(2.413)	(2.420)	(2.346)	(2.342)	(2.351)
Stock Volatility	-0.029	-0.028	-0.029	-0.027	-0.026	-0.027	-0.029	-0.028	-0.029
	(-0.218)	(-0.209)	(-0.218)	(-0.203)	(-0.193)	(-0.202)	(-0.215)	(-0.206)	(-0.217)
Firm Age	-0.031	-0.030	-0.030	-0.031	-0.030	-0.029	-0.036	-0.035	-0.034
	(-1.303)	(-1.284)	(-1.251)	(-1.286)	(-1.266)	(-1.234)	(-1.489)	(-1.470)	(-1.436)
CEO Age	-0.588***	-0.587***	-0.585***	-0.580***	-0.578***	-0.577***	-0.618***	-0.616***	-0.614***
	(-3.308)	(-3.301)	(-3.288)	(-3.248)	(-3.241)	(-3.229)	(-3.496)	(-3.487)	(-3.475)

CEO Tenure	-0.027	-0.027	-0.027	-0.033	-0.033	-0.033	-0.027	-0.027	-0.027
	(-0.952)	(-0.955)	(-0.955)	(-1.146)	(-1.150)	(-1.148)	(-0.920)	(-0.924)	(-0.923)
CEO Duality	0.097**	0.096**	0.097**	0.092**	0.092**	0.092**	0.087**	0.087**	0.087**
	(2.496)	(2.492)	(2.505)	(2.369)	(2.363)	(2.379)	(2.240)	(2.236)	(2.253)
% Independent Board	0.625***	0.624***	0.626***	0.608***	0.608***	0.610***	0.601***	0.601***	0.603***
	(4.105)	(4.103)	(4.116)	(3.976)	(3.973)	(3.988)	(3.908)	(3.906)	(3.921)
Board Size	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.002	-0.002	-0.002
	(-0.270)	(-0.259)	(-0.240)	(-0.293)	(-0.282)	(-0.262)	(-0.190)	(-0.181)	(-0.160)
Institutional Ownership Concentration	-1.302**	-1.299**	-1.292**	-1.380**	-1.377**	-1.370**	-1.310**	-1.307**	-1.302**
	(-2.374)	(-2.366)	(-2.353)	(-2.500)	(-2.493)	(-2.481)	(-2.430)	(-2.424)	(-2.413)
Institutional Ownership Total	0.557***	0.560***	0.559***	0.562***	0.564***	0.563***	0.575***	0.577***	0.576***
	(4.223)	(4.241)	(4.238)	(4.229)	(4.248)	(4.243)	(4.454)	(4.474)	(4.463)
State Educational Attainment				0.260	0.260	0.251			
				(1.282)	(1.283)	(1.238)			
State per-capita Income				-0.486*	-0.490*	-0.479*			
				(-1.798)	(-1.813)	(-1.769)			
State R&D per Capita				0.032	0.032	0.032			
				(1.240)	(1.246)	(1.244)			
Observations	10,384	10,384	10,384	10,242	10,242	10,242	10,242	10,242	10,242
Adjusted R-squared	0.363	0.364	0.364	0.363	0.363	0.363	0.367	0.367	0.367
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Table 5 - The effect of the presence of VC director on non-compensation committees on CEO vega and delta

This table shows the effect of the presence of VC directors on non-compensation committees on CEO risk-taking incentives (vega) and CEO pay-performance sensitivity (delta) using the non-VC-backed firm sample from 1998 to 2018. The dependent variable is the natural logarithm of CEO vega in year t+1 in column (1)-(4), and natural logarithm of CEO delta in year t+1 in columns (5)-(8). See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. For columns (1)-(4), we include CEO delta at time t as a control variable. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	CEO Vega $_{t+1}$				CEO Delta $_{t+1}$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VC Director on Board but not Comp. Committee	0.005				0.086			
	(0.062)				(0.883)			
VC Director on Governance Committee		-0.108				-0.059		
		(-1.247)				(-0.597)		
VC Director on Audit Committee			0.001				0.075	
			(0.005)				(0.584)	
VC Director on Nomination Committee				-0.033				0.047
				(-0.326)				(0.390)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,398	9,398	9,398	9,398	10,242	10,242	10,242	10,242
Adjusted R-squared	0.524	0.524	0.524	0.524	0.362	0.362	0.362	0.362
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 6 - The impact of VC reputation on CEO vega and delta

This table shows the effect of the VC reputation on CEO vega and delta using the non-VC-backed firm sample from 1998 to 2018. The dependent variable is the natural logarithm of CEO vega in year t+1 in Panel A, and the natural logarithm of CEO delta in year t+1 in Panel B. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. In Panel A, we further include CEO delta at time t as a control variable. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

Panel A: The impact of VC reputation on CEO vega

	CEO Vega $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High VC Reputation * VC Director on Comp. Committee	0.700***			0.690***			0.815***		
	(2.694)			(2.624)			(2.855)		
VC Director on Comp. Committee	0.210**			0.221**			0.216***		
	(2.450)			(2.532)			(2.610)		
High VC Reputation * Number of VC Directors on Comp. Committee		0.699***			0.689***			0.814***	
		(2.712)			(2.640)			(2.865)	
Number of VC Directors on Comp. Committee		0.211***			0.222***			0.218***	
		(2.685)			(2.769)			(2.845)	
High VC Reputation * % VC Director on Comp. Committee			2.314***			2.280**			2.710***
			(2.659)			(2.576)			(2.764)
% VC Director on Comp. Committee			0.809***			0.835***			0.812***
			(3.390)			(3.416)			(3.416)
High VC Reputation	-0.057	-0.056	-0.047	-0.057	-0.057	-0.046	-0.101	-0.100	-0.088
	(-0.240)	(-0.237)	(-0.200)	(-0.243)	(-0.240)	(-0.199)	(-0.423)	(-0.420)	(-0.375)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	9,535	9,535	9,535	9,398	9,398	9,398	9,398	9,398	9,398
Adjusted R-squared	0.526	0.526	0.526	0.524	0.524	0.524	0.525	0.525	0.525
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Panel B: The impact of VC reputation on CEO delta

	CEO Delta $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High VC Reputation * VC Director on Comp. Committee	1.044***			0.995***			1.113***		
	(4.122)			(3.867)			(3.937)		
VC Director on Comp. Committee	0.280**			0.294**			0.285**		
	(2.136)			(2.222)			(2.287)		
High VC Reputation * Number of VC Directors on Comp. Committee		1.032***			0.983***			1.099***	
		(4.148)			(3.885)			(3.930)	
Number of VC Directors on Comp. Committee		0.292**			0.306**			0.299**	
		(2.370)			(2.457)			(2.525)	
High VC Reputation * % VC Director on Comp. Committee			3.239***			3.063***			3.437***
			(3.666)			(3.406)			(3.361)
% VC Director on Comp. Committee			1.077***			1.108***			1.073***
			(3.023)			(3.069)			(3.108)
High VC Reputation	-0.115	-0.113	-0.088	-0.116	-0.115	-0.089	-0.181	-0.180	-0.151
	(-0.624)	(-0.617)	(-0.488)	(-0.633)	(-0.626)	(-0.490)	(-0.934)	(-0.926)	(-0.786)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	10,384	10,384	10,384	10,242	10,242	10,242	10,242	10,242	10,242
Adjusted R-squared	0.364	0.364	0.364	0.363	0.363	0.363	0.367	0.367	0.367
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Table 7 - The heterogeneity of VC directors on the compensation committee impact on CEO vega

This table shows the heterogeneity of the effect of the presence of VC directors on the compensation committee on CEO risk-taking incentives (vega) using the non-VC-backed firm sample from 1998 to 2018. The dependent variable is the natural logarithm of CEO vega in year t+1 in Panel A and the natural logarithm of CEO delta in year t+1 in Panel B. The variable's median splits high and low groups. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. We further control for CEO delta in Panel A. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

Panel A.CEO vega

	CEO Vega $_{t+1}$											
	E index		% Institutional ownership		CEO pay slice		CEO age		% Independent board members		Business segments	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee	-0.013	0.500***	0.304**	0.160	0.294**	0.140	0.083	0.332***	0.136	0.346***	0.037	0.244***
	(-0.032)	(3.941)	(2.513)	(1.399)	(2.474)	(1.188)	(0.667)	(3.241)	(1.145)	(3.685)	(0.228)	(2.828)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,172	3,680	4,671	4,727	4,833	4,016	4,256	5,142	4,591	4,807	2,979	5,024
Adjusted R-squared	0.337	0.428	0.406	0.611	0.475	0.519	0.540	0.513	0.537	0.491	0.544	0.496
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. CEO delta

	CEO Delta $_{t+1}$											
	E index		% Institutional ownership		CEO pay slice		CEO age		% Independent board members		Business segments	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee	-0.058	0.578***	0.346***	0.201	0.319**	0.227*	0.182	0.340***	0.159	0.408***	0.109	0.286***
	(-0.145)	(4.125)	(2.730)	(1.491)	(2.349)	(1.729)	(1.232)	(3.024)	(1.126)	(4.002)	(0.563)	(2.985)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,172	3,680	4,671	4,727	4,833	4,016	4,256	5,142	4,591	4,807	2,979	5,024
Adjusted R-squared	0.308	0.383	0.348	0.530	0.400	0.442	0.470	0.431	0.462	0.419	0.476	0.425
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8 - The effect of the presence of VC director on the compensation committee on the level of CEO pay

This table shows the effect of the presence of VC directors on the compensation committee on CEO level pay using the non-VC-backed firm sample from 1998 to 2018. The dependent variable total excess pay is the natural logarithm of the difference between CEO total compensation and predicted total compensation. Total pay is the natural logarithm of the total compensation of the CEO. Cash pay is the natural logarithm of CEO salary and bonus. Stock pay is the natural logarithm of the value of restricted stock grants. Option pay is the natural logarithm of the value of option grants to the CEO. Inside debt is the natural logarithm of the present value of each executive's pension benefits under all plans. Termination pay is the natural logarithm of the contractually stipulated severance pay. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	Total excess compensation t+1	Total compensation t+1	Cash pay t+1	Stock pay t+1	Option pay t+1	Inside debt t+1	Termination pay t+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VC Director on Comp. Committee	0.158**	0.169***	-0.029	0.313	0.655**	-0.206	-0.243
	(2.523)	(3.084)	(-0.321)	(0.888)	(2.356)	(-0.564)	(-0.429)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,630	10,789	10,797	10,640	10,616	5,447	5,451
Adjusted R-squared	0.179	0.584	0.304	0.325	0.125	0.387	0.108
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 9 - The effect of the presence of VC director on CEO performance goals

This table shows the effect of the presence of VC directors on CEO performance goals using the non-VC backed firm sample from 1998 to 2018. In Panel A, the sample includes all CEO equity grants. The dependent variable Group One (i.e., Profitability Goals) indicator is equal to one if a grant has at least one performance goal with the metric of EPS, EBITDA, earnings, ROIC, ROE, EBT, profit margin, EBIT, FFO, EVA, ROA, net income, ROI, NOI, gross profit, ROC, ROS, or cost reduction, and zero otherwise; Group Two (i.e., Growth Goals) indicator is equal to one if a grant has at least one performance goal with the metric of sales, operating income, cashflow, gross revenues, same store sales, IPO of a subsidiary, book value, sales contracts, or working capital, and zero otherwise; Group Three (i.e., Market-based Goals) indicator is equal to one if a grant has at least one performance goal with the market-related metric of stock price or total shareholder return (TSR), and zero otherwise. Importantly, for all three groups, we include both the level and the growth of the relevant metrics. In Panel B models (1)-(6), the sample includes all the grants. The dependent variable Absolute Goals equals one if a grant has at least one absolute goal and zero otherwise. The Relative Goal is equal to one if a grant has at least one relative goal and zero otherwise. In Panel B models (7)-(9), the sample excludes the grants with both absolute and relative goals, and the dependent variable is Absolute Goals. See Appendix A for variable definitions. CEO fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

Panel A Part I: Performance goals as groups

	Group One (Profitability Goals)			Group Two (Growth Goals)			Group Three (Market-based Goals)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.056			0.077*			-0.024		
	(0.826)			(1.808)			(-0.544)		
Number of VC Directors on Comp. Committee		0.056			0.077*			-0.024	
		(0.826)			(1.808)			(-0.544)	
% VC Director on Comp. Committee			0.219			0.295**			-0.106
			(0.993)			(2.450)			(-0.709)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,264	8,264	8,264	8,264	8,264	8,264	8,264	8,264	8,264
Adjusted R-squared	0.364	0.364	0.364	0.406	0.406	0.406	0.321	0.321	0.321
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel A Part II: Performance goals as groups using the Principle Components Analysis (PCA)

	Principle Component Group One (Profitability Goals)			Principle Component Group Two (Growth Goals)			Principle Component Group Three (Market-based Goals)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	-0.060			0.215**			0.017		
	(-0.427)			(2.394)			(0.211)		
Number of VC Directors on Comp. Committee		-0.060			0.215**			0.017	
		(-0.427)			(2.394)			(0.211)	
% VC Director on Comp. Committee			0.086			0.659**			0.006
			(0.185)			(2.397)			(0.025)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,264	8,264	8,264	8,264	8,264	8,264	8,264	8,264	8,264
Adjusted R-squared	0.462	0.462	0.462	0.425	0.425	0.425	0.320	0.320	0.320
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Absolute goals vs. Relative goals

	Absolute Goals			Relative Goals			Absolute vs. Relative		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.030			-0.065*			0.068*		
	(0.628)			(-1.900)			(1.763)		
Number of VC Directors on Comp. Committee		0.030			-0.065*			0.068*	
		(0.628)			(-1.900)			(1.763)	
% VC Director on Comp. Committee			0.089			-0.211*			0.195
			(0.649)			(-1.820)			(1.422)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,264	8,264	8,264	8,264	8,264	8,264	7,075	7,075	7,075
Adjusted R-squared	0.337	0.337	0.337	0.284	0.284	0.284	0.355	0.355	0.355
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 10 - Instrument variable analysis: the effect of the presence of VC director on the compensation committee on CEO vega and delta

This table shows the instrument variable analysis of the effect of the presence of VC director on the compensation committee on CEO risk-taking incentives (vega) and CEO pay-performance sensitivity (delta) using the non-VC backed firm sample from 1998 to 2018. First stage models present the selection equations, with the dependent variable being one of the three VC directorship variables. In second stage models, the dependent variable is the natural logarithm of CEO vega in year t+1 or the natural logarithm of CEO delta in year t+1. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects, firm fixed effects (for Panel B), and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. In models where dependent variable is CEO vega, we further include CEO delta as a control. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

Panel A: 2SLS analysis

	CEO Vega $_{t+1}$						CEO Delta $_{t+1}$					
Stage	First	Second	First	Second	First	Second	First	Second	First	Second	First	Second
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee		3.376**						3.932*				
		(2.151)						(1.946)				
Number of VC Directors on Comp. Committee				2.988**						3.420*		
				(2.080)						(1.852)		
% VC Director on Comp. Committee						9.195**						10.446*
						(2.041)						(1.850)
Direct Flight -- SF	-0.002		-0.002		-0.001		-0.002		-0.002		-0.001	
	(-0.282)		(-0.189)		(-0.405)		(-0.307)		(-0.218)		(-0.426)	
Direct Flight -- BOS	0.002		0.000		-0.000		0.002		0.001		-0.000	
	(0.235)		(0.045)		(-0.160)		(0.278)		(0.091)		(-0.125)	
VC Dry Powder	-0.002***		-0.003***		-0.001**		-0.002***		-0.003***		-0.001**	
	(-2.657)		(-2.678)		(-2.410)		(-2.656)		(-2.676)		(-2.409)	
VC Dry Powder Squared	0.000***		0.000***		0.000**		0.000***		0.000***		0.000**	
	(2.591)		(2.634)		(2.459)		(2.593)		(2.634)		(2.460)	
Driving Distance -- SF	-0.010		-0.011		-0.004		-0.010		-0.011		-0.004	
	(-0.671)		(-0.721)		(-0.821)		(-0.653)		(-0.701)		(-0.803)	
Driving Distance -- BOS	-0.040***		-0.045***		-0.013***		-0.040***		-0.045***		-0.013***	
	(-2.629)		(-2.611)		(-2.780)		(-2.631)		(-2.612)		(-2.781)	
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076
Adjusted R-squared		0.438		0.450		0.461		0.248		0.268		0.282
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-stat for Excluded Instruments		2.31		2.27		2.33		2.33		2.28		2.35
Cragg-Donald F-stat		7.90		8.46		9.66		7.99		8.54		9.73
CD Nearest Lower Critical Value		6.76		6.76		6.76		6.76		6.76		6.76
CD Nearest Lower Critical %		20%		20%		20%		20%		20%		20%
Kleibergen-Paap p-value		0.04		0.05		0.04		0.04		0.04		0.04
Sargan p-value		0.26		0.20		0.19		0.03		0.02		0.01
Sargan p-value (in a model without clustering)		0.66		0.61		0.53		0.17		0.13		0.10

Panel B: 2SLS analysis with firm and year fixed effects

	CEO Vega $_{t+1}$						CEO Delta $_{t+1}$					
Stage	First	Second	First	Second	First	Second	First	Second	First	Second	First	Second
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee		4.997*						4.249				
		(1.877)						(1.562)				
Number of VC Directors on Comp. Committee				4.992*						4.244		
				(1.875)						(1.560)		
% VC Director on Comp. Committee						11.985*						9.164
						(1.702)						(1.265)
Direct Flight -- SF	0.027		0.027		0.008		0.027		0.027		0.008	
	(1.468)		(1.463)		(1.527)		(1.469)		(1.464)		(1.526)	
Direct Flight -- BOS	0.038		0.038		0.011		0.038		0.038		0.011	
	(1.585)		(1.577)		(1.547)		(1.591)		(1.584)		(1.540)	
VC Dry Powder	-0.001		-0.001		-0.000		-0.001		-0.001		-0.000	
	(-1.303)		(-1.315)		(-1.479)		(-1.299)		(-1.310)		(-1.474)	
VC Dry Powder Squared	0.000		0.000		0.000*		0.000		0.000		0.000*	
	(1.528)		(1.540)		(1.678)		(1.523)		(1.534)		(1.671)	
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,872	8,872	8,872	8,872	8,872	8,872	8,872	8,872	8,872	8,872	8,872	8,872
Adjusted R-squared		-0.259		-0.263		-0.141		-0.270		-0.273		-0.174
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-stat for Excluded Instruments		1.87		1.87		1.94		1.87		1.88		1.95
Cragg-Donald F-stat		9.83		9.62		11.14		9.85		9.65		11.13
CD Nearest Lower Critical Value		6.71		6.71		10.27		6.71		6.71		10.27
CD Nearest Lower Critical %		20%		20%		10%		20%		20%		10%
Kleibergen-Paap p-value		0.13		0.13		0.12		0.13		0.13		0.12
Sargan p-value		0.14		0.14		0.05		0.02		0.02		0.01
Sargan p-value (in a model without clustering)		0.01		0.01		0.00		0.00		0.00		0.00

Panel C: Dynamic GMM analysis

	CEO Vega $_{t+1}$			CEO Delta $_{t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)
VC Director on Comp. Committee	0.553**			0.854**		
	(2.088)			(2.086)		
Number of VC Directors on Comp. Committee		0.535**			0.851**	
		(2.234)			(2.335)	
% VC Director on Comp. Committee			2.005			2.868
			(1.517)			(1.461)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,590	8,590	8,590	8,590	8,590	8,590
Number of Firms	1,346	1,346	1,346	1,346	1,346	1,346
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
F-stat for Excluded Instruments	6.67	6.35	4.01	6.96	6.64	4.15
p-value for Excluded Instruments	0.00	0.00	0.00	0.00	0.00	0.00
p-value for AR(1)	0.00	0.00	0.00	0.00	0.00	0.00
p-value for AR(2)	0.55	0.54	0.50	0.05	0.05	0.05
Hensen J-stat	36.64	36.74	36.70	34.48	34.51	35.21
Hensen J-stat p-value	0.22	0.22	0.22	0.35	0.35	0.32

Panel D. Instrument variable 2SLS analysis for performance goals

	Group One (Profitability Goals)				Group Two (Growth Goals)				Group Three (Market-based Goals)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee		-1.532	1.396*	0.118								
		(-1.265)	(1.748)	(0.255)								
Number of VC Directors on Comp. Committee						-1.532	1.396*	0.118				
						(-1.265)	(1.748)	(0.255)				
% VC Director on Comp. Committee										-6.200	4.090	1.114
										(-1.286)	(1.261)	(0.502)
Direct Flight	-0.017				-0.017				-0.004			
	(-1.148)				(-1.148)				(-0.935)			
VC Dry Powder	-0.001				-0.001				-0.000			
	(-0.882)				(-0.882)				(-0.717)			
VC Dry Powder Squared	0.000				0.000				0.000			
	(0.742)				(0.742)				(0.560)			
Driving Distance	-0.005				-0.005				-0.004			
	(-0.081)				(-0.081)				(-0.175)			
Min. Distance to Top 50 VC Cities	0.000				0.000				0.000			
	(1.379)				(1.379)				(1.316)			
VC Firm Density by State	-0.145				-0.145				-0.012			
	(-1.194)				(-1.194)				(-0.293)			
VC-Backed Company Density by State	0.058				0.058				0.002			
	(0.811)				(0.811)				(0.103)			
VC Firm Density by MSA	0.138**				0.138**				0.029*			
	(2.042)				(2.042)				(1.746)			
VC-Backed Company Density by MSA	-0.044				-0.044				-0.005			
	(-0.855)				(-0.855)				(-0.361)			
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,826	5,826	5,826	5,826	5,826	5,826	5,826	5,826	5,826	5,826	5,826	5,826
Adjusted R-squared		-0.441	-0.326	-0.160		-0.441	-0.326	-0.160		-0.634	-0.302	-0.179
CEO FE		Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes
Year FE		Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes
F-stat for Excluded Instruments	0.92	0.92	0.92		0.92	0.92	0.92		0.88	0.88	0.88	0.92
Cragg-Donald F-stat	2.62	2.62	2.62		2.62	2.62	2.62		1.32	1.32	1.32	2.62
Kleibergen-Paap p-value	0.81	0.81	0.81		0.81	0.81	0.81		0.83	0.83	0.83	0.81
Sargan p-value	0.38	0.46	0.68		0.38	0.46	0.68		0.52	0.37	0.71	0.38

Table 11 - Heckman analysis: the effect of the presence of VC director on the compensation committee on CEO vega and delta

This table shows the Heckman analysis of the effect of the presence of VC director on the compensation committee on CEO risk-taking incentives (vega) and CEO pay-performance sensitivity (delta) using the non-VC-backed firm sample from 1998 to 2018. First stage models present the selection equations, with the dependent variable being one of the three VC directorship variables. In the second stage models, the dependent variable is the natural logarithm of CEO vega in year t+1 or the natural logarithm of CEO delta in year t+1. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects, and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. In models where the dependent variable is CEO vega, we further include CEO delta as a control. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	CEO Vega $_{t+1}$						CEO Delta $_{t+1}$					
Stage	First	Second	First	Second	First	Second	First	Second	First	Second	First	Second
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee		0.169**						0.303***				
		(2.135)						(2.631)				
Number of VC Directors on Comp. Committee				0.172**						0.305***		
				(2.350)						(2.899)		
% VC Director on Comp. Committee						0.644***						1.025***
						(2.958)						(3.229)
Direct Flight -- SF	0.044		0.044		0.044		0.049		0.049		0.049	
	(1.067)		(1.064)		(1.063)		(1.162)		(1.153)		(1.153)	
Direct Flight -- BOS	-0.059		-0.059		-0.059		-0.040		-0.040		-0.040	
	(-1.289)		(-1.287)		(-1.284)		(-0.890)		(-0.886)		(-0.885)	
VC Dry Powder	-0.013***		-0.013***		-0.013***		-0.011***		-0.011***		-0.011***	
	(-7.128)		(-7.125)		(-7.061)		(-6.309)		(-6.306)		(-6.283)	
VC Dry Powder Squared	0.000***		0.000***		0.000***		0.000***		0.000***		0.000***	
	(6.865)		(6.862)		(6.786)		(5.970)		(5.967)		(5.939)	
Driving Distance -- SF	0.104		0.104		0.104		0.106		0.106		0.106	
	(1.291)		(1.291)		(1.293)		(1.454)		(1.454)		(1.453)	
Driving Distance -- BOS	-0.054		-0.054		-0.053		-0.033		-0.032		-0.033	
	(-0.685)		(-0.680)		(-0.674)		(-0.453)		(-0.443)		(-0.446)	
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,567	10,567	10,567	10,567	10,567	10,567	10,567	10,567	10,567	10,567	10,567	10,567
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Likelihood	-17,952	-17,952	-17,951	-17,951	-17,951	-17,951	-19,178	-19,178	-19,178	-19,178	-19,177	-19,177
P-value for Comparison Test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 12 - Matched sample analysis: the effect of the presence of VC director on the compensation committee on CEO vega and delta

This table shows the effect of the presence of VC directors on the compensation committee on CEO risk-taking incentives using the matched sample. The dependent variable is the natural logarithm of CEO vega in year t+1 in Panel A and the natural logarithm of CEO delta in year t+1 in Panel B. The treatment group is the firms with VC directors on board. The control group is matched on the industry, fiscal year, firm size, CEO vega at time t-1, CEO delta at time t-1, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, and firm age. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. In Panel A, we further include CEO delta at time t as a control. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

Panel A: CEO vega

	CEO Vega $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.206**			0.219**			0.222**		
	(2.248)			(2.417)			(2.516)		
Number of VC Directors on Comp. Committee		0.205**			0.218***			0.223***	
		(2.441)			(2.614)			(2.727)	
% VC Director on Comp. Committee			0.786***			0.795***			0.819***
			(2.949)			(2.933)			(3.131)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	788	788	788	785	785	785	785	785	785
Adjusted R-squared	0.533	0.533	0.535	0.531	0.531	0.533	0.554	0.555	0.556
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Panel B: CEO delta

	CEO Delta $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.298**			0.300**			0.287**		
	(2.312)			(2.376)			(2.338)		
Number of VC Directors on Comp. Committee		0.306***			0.308***			0.302***	
		(2.590)			(2.658)			(2.658)	
% VC Director on Comp. Committee			1.062***			1.025***			1.014***
			(3.035)			(2.933)			(3.017)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	788	788	788	785	785	785	785	785	785
Adjusted R-squared	0.371	0.372	0.373	0.372	0.374	0.374	0.418	0.419	0.420
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Table 13 - The effect of the presence of VC director on the compensation committee on R&D intensity

This table shows the effect of the presence of VC directors on the compensation committee on R&D intensity using the non-VC-backed firm sample from 1998 to 2018. The dependent variable is R&D expenditure scaled by total assets. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	R&D Intensity $_{t+1}$			
	(1)	(2)	(3)	(4)
VC Director on Comp. Committee * CEO Vega $_{t+1}$		0.005**		
		(2.322)		
CEO Vega $_{t+1}$	0.002***	0.001***		
	(3.924)	(3.717)		
VC Director on Comp. Committee * CEO Delta $_{t+1}$				0.004**
				(1.967)
CEO Delta $_{t+1}$			0.002***	0.002***
			(4.203)	(3.996)
VC Director on Comp. Committee	0.005	-0.013	0.005	-0.009
	(1.385)	(-1.603)	(1.349)	(-1.264)
Size	-0.002**	-0.002**	-0.002**	-0.002**
	(-2.332)	(-2.323)	(-2.416)	(-2.404)
Leverage	-0.028***	-0.028***	-0.028***	-0.028***
	(-6.229)	(-6.250)	(-6.243)	(-6.266)
Market-to-Book	0.000	0.000	0.000	0.000
	(1.138)	(1.140)	(1.171)	(1.171)
ROA	-0.116***	-0.117***	-0.116***	-0.116***
	(-4.834)	(-4.852)	(-4.820)	(-4.835)
Tangibility	-0.011***	-0.011***	-0.011***	-0.011***
	(-2.786)	(-2.763)	(-2.766)	(-2.740)
Firm Age	-0.000	-0.000	-0.000	-0.000
	(-0.538)	(-0.560)	(-0.459)	(-0.477)
Board Size	-0.000	-0.000	-0.000	-0.000
	(-0.810)	(-0.814)	(-0.748)	(-0.746)
Tobin's Q	0.008***	0.008***	0.008***	0.008***
	(6.170)	(6.185)	(6.132)	(6.145)
State Controls	Yes	Yes	Yes	Yes
Observations	11,252	11,252	11,252	11,252
Adjusted R-squared	0.404	0.405	0.405	0.405
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 14 - The effect of the presence of VC director on the compensation committee on innovation output

This table shows the Tobit model of the effect of the presence of VC directors on the compensation committee on innovation output using the non-VC-backed firm sample from 1998 to 2018. The patent count is the number of patents issued in year t+1. Forward 5-yr Citations is the sum of patent citations from year t+1 to year t+5. Innovation value (real) is the real innovation value in year t+1. Innovation value (nominal) is the nominal innovation value in year t+1. Forward 5-yr innovation value (real) is the real innovation value from year t+1 to year t+5. Forward 5-yr innovation value (nominal) is the nominal innovation value from year t+1 to year t+5. All innovation output measures are adjusted by industry and year. Lag CEO Vega is the average of Ln CEO vega from t-1 to t-3. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, age, leverage, market-to-book ratio, ROA, tangibility, Tobin's Q, and board size. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

Panel A. CEO vega

	Patent Count $_{t+1}$		Forward 5-yr Citations		Innovation Value (Real) $_{t+1}$		Innovation Value (Nominal) $_{t+1}$		Forward 5-yr Innovation Value (Real)		Forward 5-yr Innovation Value (Nominal)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee * Lag CEO Vega		0.651**		0.631		0.808*		0.807*		0.381**		0.923**
		(2.088)		(1.636)		(1.858)		(1.857)		(2.132)		(2.077)
Lag CEO Vega	0.156	0.142	0.237	0.223	0.181	0.163	0.180	0.163	0.049	0.041	0.111	0.092
	(0.595)	(0.535)	(1.555)	(1.443)	(1.222)	(1.085)	(1.217)	(1.079)	(0.839)	(0.698)	(0.847)	(0.695)
VC Director on Comp. Committee	1.383**	-0.890	1.630**	-0.542	1.375**	-1.453	1.375**	-1.451	0.437*	-0.878	1.050*	-2.139
	(2.012)	(-0.729)	(2.125)	(-0.391)	(2.356)	(-1.021)	(2.360)	(-1.020)	(1.681)	(-1.472)	(1.774)	(-1.471)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,736	13,736	12,571	12,571	13,736	13,736	13,736	13,736	12,859	12,859	12,859	12,859
Pseudo R-squared	0.089	0.089	0.092	0.092	0.113	0.113	0.113	0.113	0.133	0.133	0.103	0.103
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. CEO delta

	Patent Count $_{t+1}$		Forward 5-yr Citations		Innovation Value (Real) $_{t+1}$		Innovation Value (Nominal) $_{t+1}$		Forward 5-yr Innovation Value (Real)		Forward 5-yr Innovation Value (Nominal)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee * Lag CEO Delta		0.630**		0.560		1.021**		1.021**		0.471**		1.113**
		(2.021)		(1.436)		(2.306)		(2.305)		(2.446)		(2.409)
Lag CEO Delta	0.148	0.132	0.194	0.181	0.153	0.128	0.152	0.127	0.043	0.032	0.092	0.067
	(0.600)	(0.531)	(1.345)	(1.237)	(1.085)	(0.900)	(1.078)	(0.893)	(0.771)	(0.577)	(0.734)	(0.532)
VC Director on Comp. Committee	1.378**	-0.841	1.627**	-0.340	1.373**	-2.242	1.373**	-2.243	0.436*	-1.225**	1.049*	-2.880*
	(2.001)	(-0.595)	(2.113)	(-0.206)	(2.358)	(-1.604)	(2.362)	(-1.604)	(1.682)	(-1.975)	(1.776)	(-1.924)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,736	13,736	12,571	12,571	13,736	13,736	13,736	13,736	12,859	12,859	12,859	12,859
Pseudo R-squared	0.088	0.089	0.092	0.092	0.112	0.113	0.113	0.113	0.133	0.133	0.103	0.103
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 15 - The effect of the presence of VC director on the governance or nominating committee on CEO forced turnover

This table shows the effect of the presence of VC directors on the governance or nominating committee on CEO forced turnover using the non-VC-backed firm sample from 1998 to 2018. The dependent variable CEO forced turnover is an indicator variable taking the value of one if CEO turnover is forced and zero otherwise. Abnormal return is the industry and year adjusted abnormal return calculated by subtracting the S&P 500 annual return from annual stock raw return. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	CEO Forced Turnover		
	(1)	(2)	(3)
VC Director on Nom. Committee * Abnormal Return	-0.046*		
	(-1.664)		
VC Director on Nom. Committee	0.007		
	(0.799)		
VC Director on Gov. Committee * Abnormal Return		-0.046	
		(-1.508)	
VC Director on Gov. Committee		0.004	
		(0.485)	
VC Director on Nom. or Gov. Committee * Abnormal Return			-0.046*
			(-1.662)
VC Director on Nom. or Gov. Committee			0.007
			(0.791)
Abnormal Return	-0.019***	-0.019***	-0.019***
	(-5.823)	(-5.868)	(-5.823)
Baseline Controls	Yes	Yes	Yes
Observations	16,085	16,085	16,085
Adjusted R-squared	0.024	0.024	0.024
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 16 - Placebo test: the effect of the presence of coincidental VC director on the compensation committee on CEO vega and delta

This table shows the placebo tests of the baseline results. A coincidental VC director is an ordinary director who eventually gets employed by a VC firm during their tenure (but not before) as a director. The dependent variable is the natural logarithm of CEO vega in year t+1 in column (1)-(6), and the natural logarithm of CEO delta in year t+1 in column (7)-(12). See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. State controls include state educational attainment, state per-capita income, and state R&D per capita. For columns (1)-(6), we also include CEO delta at time t as a control variable. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	CEO Vega t+1						CEO Delta t+1					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Coincidental VC Director on Comp. Committee	0.053	0.050					0.060	0.053				
	(0.840)	(0.799)					(0.662)	(0.587)				
VC Director on Comp. Committee		0.235***						0.311**				
		(2.710)						(2.379)				
Coincidental Number of VC Directors on Comp. Committee			0.057	0.055					0.060	0.053		
			(0.913)	(0.877)					(0.679)	(0.605)		
Number of VC Directors on Comp. Committee				0.235***						0.321***		
				(2.947)						(2.616)		
Coincidental % VC Director on Comp. Committee					0.298	0.294					0.379	0.363
					(1.333)	(1.318)					(1.278)	(1.236)
% VC Director on Comp. Committee						0.874***						1.150***
						(3.569)						(3.208)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,398	9,398	9,398	9,398	9,398	9,398	10,242	10,242	10,242	10,242	10,242	10,242
Adjusted R-squared	0.524	0.524	0.524	0.524	0.524	0.524	0.362	0.363	0.362	0.363	0.363	0.364
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	No	No	No	No	No	No

Appendix Tables to Venture Capitalist Directors and Managerial Incentives

Lubomir P. Litov
University of Oklahoma

Xia (Summer) Liu
University of Richmond

William L. Megginson
University of Oklahoma
University of International Business & Economics (Beijing)

Romora E. Sitorus
Indonesian Ministry for Economic Affairs

Appendix A. Variable definitions

The variables used in this study are defined in the Appendix below. We winsorize numerical variables at the 1st and the 99th percentiles.

Variables	Descriptions	Data Sources
Abnormal Return	Industry and year adjusted abnormal return calculated by subtracting the S&P 500 annual return from annual stock raw return.	CRSP
Absolute Goal	The probability of having an absolute performance goal.	ISS
Board Size	Number of directors on the board at year-end.	ISS
Business Segments	Number of business segments.	Compustat
Cash Pay	Natural logarithm of sum of CEO salary and bonus.	Execucomp
CEO Age	Natural logarithm of CEO's age in the sample year.	Execucomp
CEO Duality	Dummy variable taking the value of one if the CEO is the chairperson and zero otherwise.	ISS
CEO Forced Turnover	Dummy variable taking the value of one if CEO is forced.	Florian Peters' website
CEO Pay Slice	Proportion of CEO total compensation in total compensation of top five highest paid executives.	Execucomp
CEO Pay-Performance Sensitivity (Delta)	Natural logarithm of expected dollar change in the value of the CEO's current year annual equity-based compensation (in $ thousands) for a 1% change in the stock price. We compute delta using the sum of all current option grants, number of shares of current restricted stock grants, and number of targeted shares granted. The variable definition is based on Hayes, Lemmon, and Qiu (2012).	Execucomp, CRSP
CEO Risk-Taking Incentives (Vega)	Natural logarithm of expected dollar change in the value of the CEO's current year annual option grant (in $ thousands) for a 1% change in stock price volatility. We compute vega using current year option granted. The variable definition is based on Hayes, Lemmon, and Qiu (2012).	Execucomp, CRSP
CEO Tenure	Natural logarithm of number of years since the director became CEO.	Execucomp
Direct Flight	Dummy variable taking the value of one if there are direct flights in all twelve months in a year both from a home airport to a hub city and from a hub city to a home airport, and zero otherwise.	BTS
Driving Distance	Dummy variable taking the value of one if a company's headquarter's zipcode is within 100 miles of the zipcode of the US Postal Service main office in a hub city.	
E index	The entrenchment index based on Bebchuk, Cohen, and Ferrell (2009) (available before 2006).	Lucian Bebchuk's website
Firm Age	Natural logarithm of number of years since the firm's IPO.	CRSP
Forward 5-yr Citations	Industry and year adjusted number of citations from year t+1 to year t+5.	KPSS2017, PatentView

Forward 5-yr Innovation Value (Nominal)	Industry and year adjusted sum of nominal innovation value from year t+1 to year t+5.	KPSS2017
Forward 5-yr Innovation Value (Real)	Industry and year adjusted sum of real innovation value from year t+1 to year t+5.	KPSS2017
G Index	The governance index based on Gompers, Ishii, Metrick (2003) (available before 2006).	ISS
High VC Reputation	Dummy variable taking the value of one if a VC firm has 70 or higher Lee-Pollock-Jin (2011) VC reputation index.	Timothy G. Pollock's website
Independent Board	Percentage of outside directors on the board identified as independent of the CEO and firm.	ISS
Innovation Value (Nominal)	Industry and year adjusted nominal innovation value.	KPSS2017
Innovation Value (Real)	Industry and year adjusted real innovation value.	KPSS2017
Inside Debt	Natural logarithm of sum of CEO pension value and deferred benefit.	Execucomp
Institutional Ownership Concentration	Sum of squared individual institutional holdings divided by total institutional holdings.	Thomson Reuters 13F Holdings
Institutional Ownership Total	Aggregate percent of outstanding shares of a company held by all financial institutions.	Thomson Reuters 13F Holdings
Leverage	Ratio of the book value of debt (dlc + dltt) to the sum of the book value of debt (dlc + dltt) and market capitalization (prcc × csho).	Compustat
Market-to-Book Ratio	Ratio of market value of assets (total assets plus market value of equity minus book value of equity) to total assets ((at + csho × prcc_f – ceq)/at).	Compustat
Number of VC Directors on Compensation Committee	Number of VC directors who are compensation committee member or chair.	ISS, SDC VentureXpert
Option Pay	Natural logarithm of Black-Scholes value of CEO option award before 2006 or fair value of CEO option award after 2006.	Execucomp
Patent Count	Industry and year adjusted number of patents filed.	KPSS2017
R&D Intensity	Ratio of research and development expenditures to total assets (xrd/at).	Compustat
Relative Goal	The probability of having a relative performance goal.	ISS
ROA	Earnings before interest, taxes, depreciation and amortization over total assets (ebitda/total assets).	Compustat
Sales Growth Goal	The magnitude of the absolute sales growth goal.	ISS
Size	Natural logarithm of total assets (at).	Compustat
State Education Attainment	Natural logarithm of percentage of the population age twenty-five and over with a bachelor's degree or more.	United States Census Bureau

State Income per Capita	Natural logarithm of per-capita income in the state of the firm.	United States Bureau of Economic Analysis
State R&D per Capita	Natural logarithm of total R&D expense per capita in the state of the firm.	National Science Foundation
Stock Pay	Natural logarithm of CEO restricted stock grant before 2006 or fair value of stock awards after 2006.	Execucomp
Stock Price Goal	The probability of having an absolute stock price goal.	ISS
Stock Return	Annual stock return for the fiscal year.	CRSP
Stock Volatility	Annualized standard deviation of daily returns computed over the year.	Compustat
Supply of VC Executives	The number of unique VC executives available within 30 miles of a company's headquarter zipcode.	SDC VentureXpert
Tangibility	Ratio of net property, plant, and equipment (ppent) to total assets (at).	Compustat
Termination Pay	Natural logarithm of CEO estimated payments in event of involuntary termination.	Execucomp
Tobin's Q	Market value of assets divided by book value of assets.	Compustat
Total Compensation	Natural logarithm of total CEO compensation in $ thousands (tdc1).	Execucomp
Total Excess Compensation	Natural logarithm of difference between CEO total compensation and predicted total compensation.	Execucomp
VC Director	Dummy variable taking the value of one if a director has prior VC experience, and zero otherwise.	ISS, SDC VentureXpert
VC Director on Audit Committee	Number of VC directors who are audit committee member or chair.	ISS, SDC VentureXpert
VC Director on Compensation Committee	Dummy variable taking the value of one if a director is a VC director and is a member or chair of compensation committee, and zero otherwise.	ISS, SDC VentureXpert
VC Director on Governance Committee	Number of VC directors who are governance committee member or chair.	ISS, SDC VentureXpert
VC Director on Nomination Committee	Number of VC directors who are nomination committee member or chair.	ISS, SDC VentureXpert
VC Dry Powder	Investible but un-invested VC capital by industry-year following Aggarwal et al. (2022).	
VC-Backed Firm	Dummy variable taking the value of one if the firm is VC-backed and zero otherwise.	SDC Initial Public Offerings
% Independent Board Members	Percentage of independent members on board.	ISS
% VC Director on Compensation Committee	Number of VC directors who are compensation committee member or chair as a percentage of total number of board members.	ISS, SDC VentureXpert

Appendix B. Merging SDC VentureXpert with ISS Director database

In this appendix, we describe the process of merging venture capital companies in the VentureXpert database with ISS databases through matching venture capital firm names in VentureXpert with the director's primary employment names in the ISS database.

B.1. Name Standardization

We begin by standardizing company names in VentureXpert and primary employment names from ISS databases using the name standardization algorithm developed by the NBER Patent Data Project. This algorithm standardizes common company prefixes and suffixes and strips names of punctuation and capitalization; it also isolates a company's stem name (the main body of the company name), excluding these prefixes and suffixes.

B.2. The Matching Procedure

With these standardized and stem company names provided by both VentureXpert and the ISS database, we merge the databases following the matching procedures similar to Ma (2020) and DiNardo and Lee (2004) as shown below:

1. We match each standardized ISS company name with standardized names from the VentureXpert data.
    a. If we identify the exact match of standardized names, we consider this as a "successful match".
    b. Otherwise, we consider the rest as "potential match" and follow the next step

2. We match each stem ISS company name with stem names from VentureXpert data.
    a. If we identify the exact match of stem names, we consider this as "successful match".
    b. Otherwise, we consider the rest as "potential match" and follow the next step

3. For the remaining companies, each standardized and stem ISS company name is matched with close standardized and stem names from the VentureXpert data using a Spelling distance method. The criterion is based on the possible matching scenarios by translating a keyword into a query containing the smallest distance value. The method evaluates the query and keyword arguments returning non-negative spelling distance values. A derived value of zero indicates an exact match. Generally, derived values are less than 100. We can control the matching process by specifying spelling distance values greater than zero

    a. As a first pass, we modified the program to match only on the firm name, and discovered that in this application, that same threshold led to "too many" matches. As we describe, we, therefore, augmented the process with a manual review. In these cases, we selected the lowest spelling distance as the candidate match. If there was a tie in spelling distance between two candidate comparisons, we selected one match at random. We reviewed every match and dropped those where they judged the two firm

names as different companies and categorizes some as a "potential match" and the remaining as "failed to match"

b. The "potential matches" set identified in the procedures above is reviewed by hand, incorporating information from www.crunchbase.com, www.bloomberg.com, including company business descriptions.
c. Pairs confirmed as successful matches through the manual check are moved to the "successful match" set.

Appendix C. Baseline results using alternative samples and VC director definition

This table shows the baseline models presented in Table 3 and Table 4 if including VC-backed IPOs and including coincidental VC directors. Panel A and B present the results if both VC-backed IPOs and non-VC-backed IPOs are included in the sample. There are 147 unique firms with VC directors on board. Panel C and D present the results if both coincidental VC directors and the VC directors with prior VC experience are considered as VC directors. There are 234 unique firms with VC directors on board. Panel E and F present the results if both coincidental VC directors and the VC directors with prior VC experience are considered as VC directors, and if both VC-backed IPOs and non-VC-backed IPOs are included in the sample. There are 395 unique firms with VC directors on board.

Panel A. Table 3 results after including VC-backed IPOs

	CEO Vega $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.176**			0.181**			0.192***		
	(2.437)			(2.499)			(2.718)		
Number of VC Directors on Comp. Committee		0.168**			0.173**			0.183***	
		(2.505)			(2.578)			(2.814)	
% VC Director on Comp. Committee			0.587***			0.597***			0.619***
			(2.827)			(2.859)			(3.035)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	11,542	11,542	11,542	11,378	11,378	11,378	11,378	11,378	11,378
Adjusted R-squared	0.515	0.515	0.515	0.513	0.513	0.513	0.514	0.514	0.514
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Panel B. Table 4 results after including VC-backed IPOs

	CEO Delta $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.208*			0.214*			0.227**		
	(1.895)			(1.957)			(2.153)		
Number of VC Directors on Comp. Committee		0.203*			0.209**			0.222**	
		(1.934)			(2.002)			(2.205)	
% VC Director on Comp. Committee			0.701**			0.710**			0.745**
			(2.205)			(2.243)			(2.434)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	12,584	12,584	12,584	12,412	12,412	12,412	12,412	12,412	12,412
Adjusted R-squared	0.351	0.351	0.351	0.351	0.351	0.351	0.355	0.355	0.355
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Panel C. Table 3 results after including coincidental VC directors

	CEO Vega $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.126**			0.125**			0.135***		
	(2.386)			(2.357)			(2.588)		
Number of VC Directors on Comp. Committee		0.120**			0.120**			0.130**	
		(2.331)			(2.293)			(2.575)	
% VC Director on Comp. Committee			0.513***			0.515***			0.543***
			(3.004)			(2.967)			(3.191)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	9,535	9,535	9,535	9,398	9,398	9,398	9,398	9,398	9,398
Adjusted R-squared	0.526	0.526	0.526	0.524	0.524	0.524	0.525	0.525	0.525
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Panel D. Table 4 results after including coincidental VC directors

	CEO Delta $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.158**			0.155**			0.163**		
	(2.034)			(1.980)			(2.156)		
Number of VC Directors on Comp. Committee		0.155**			0.153**			0.160**	
		(2.085)			(2.034)			(2.232)	
% VC Director on Comp. Committee			0.671***			0.666***			0.684***
			(2.869)			(2.816)			(2.977)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	10,384	10,384	10,384	10,242	10,242	10,242	10,242	10,242	10,242
Adjusted R-squared	0.363	0.363	0.364	0.363	0.363	0.363	0.367	0.367	0.367
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Panel E. Table 3 results after including coincidental VC directors and VC-backed IPOs

	CEO Vega $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.108***			0.106**			0.111***		
	(2.595)			(2.525)			(2.640)		
Number of VC Directors on Comp. Committee		0.089**			0.089**			0.093**	
		(2.367)			(2.340)			(2.506)	
% VC Director on Comp. Committee			0.293**			0.292**			0.299***
			(2.537)			(2.507)			(2.591)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	11,542	11,542	11,542	11,378	11,378	11,378	11,378	11,378	11,378
Adjusted R-squared	0.515	0.515	0.515	0.513	0.513	0.513	0.514	0.514	0.514
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Panel F. Table 4 results after including coincidental VC directors and VC-backed IPOs

	CEO Delta $_{t+1}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VC Director on Comp. Committee	0.154**			0.146**			0.151**		
	(2.464)			(2.329)			(2.435)		
Number of VC Directors on Comp. Committee		0.138**			0.132**			0.136**	
		(2.476)			(2.350)			(2.472)	
% VC Director on Comp. Committee			0.483***			0.467***			0.471***
			(2.821)			(2.712)			(2.763)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	No	No	No	Yes	Yes	Yes	No	No	No
Observations	12,584	12,584	12,584	12,412	12,412	12,412	12,412	12,412	12,412
Adjusted R-squared	0.351	0.351	0.352	0.351	0.351	0.351	0.355	0.355	0.355
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	No	Yes	Yes	Yes

Appendix D. Performance goal metrics distributions

This table shows the distribution of all performance goal metrics collected from ISS Incentive Lab. We categorize all goals into four groups, Profit, Growth, Market, and Unclassified. Panel A and Panel B present the distribution of absolute goals and relative goals, respectively.

Panel A. Absolute goals

Goal Group	Absolute Goal Metric	#	%	Goal Group	Absolute Goal Metric	#	%
Unclassified	Other	32,242	26.98	*Market*	Stock Price	344	0.29
Profitability	EPS	11,864	9.93	*Growth*	Same store sales	185	0.15
Growth	Sales	11,206	9.38	*Unclassified*	Business Unit	140	0.12
Unclassified	Individual	8,685	7.27	*Profitability*	Noi	131	0.11
Growth	Operating Income	7,993	6.69	*Unclassified*	Staff Relations, Engagement And Training	126	0.11
Profitability	EBITDA	6,522	5.46	*Unclassified*	Diversity	125	0.1
Growth	Cashflow	6,133	5.13	*Unclassified*	Csr	100	0.08
Profitability	Earnings	5,437	4.55	*Profitability*	Gross Profit	96	0.08
Profitability	ROIC	4,139	3.46	*Growth*	Same Store Sales	92	0.08
Profitability	ROE	2,914	2.44	*Unclassified*	Climate Change And Energy Use	85	0.07
Unclassified	Non-Financial	2,720	2.28	*Unclassified*	Environmental Protection	77	0.06
Profitability	EBT	2,335	1.95	*Unclassified*	Fda Approval	74	0.06
Unclassified	Operational	1,993	1.67	*Unclassified*	Customer And Product Responsibility	60	0.05
Profitability	Profit Margin	1,900	1.59	*Unclassified*	Discretionary	38	0.03
Growth	Gross Revenues	1,864	1.56	*Profitability*	Roc	37	0.03
Profitability	EBIT	1,507	1.26	*Unclassified*	FDA Approval	16	0.01
Profitability	FFO	1,274	1.07	*Growth*	IPO of Subsidiary	12	0.01
Profitability	EVA	1,230	1.03	*Unclassified*	Resource Use	7	0.01
Profitability	ROA	1,167	0.98	*Growth*	Book Value	6	0.01
Unclassified	Customer Satisfaction	1,047	0.88	*Profitability*	Cost Reduction	5	0
Unclassified	Vague	950	0.8	*Unclassified*	Society And Human Rights	5	0
Market	Tsr	809	0.68	*Unclassified*	Balance Sheet Related	1	0
Unclassified	Staff Health And Safety	613	0.51	*Unclassified*	Labor Conditions In Supply Chain	1	0
Profitability	Net Income	409	0.34	*Growth*	Sales Contracts	1	0
Unclassified	Debt Related	396	0.33	*Growth*	Working Capital	1	0
Profit	ROI	373	0.31		**Total**	**119,487**	

Panel B. Relative goals

Goal Group	Relative Goal Metric	#	%	Goal Group	Relative Goal Metric	#	%
Market	Tsr	2,270	27.54	*Profitability*	EBT	39	0.47
Unclassified	Other	1,502	18.22	*Profitability*	EBIT	32	0.39
Profitability	ROIC	713	8.65	*Unclassified*	Customer Satisfaction	30	0.36
Profitability	ROE	616	7.47	*Unclassified*	Staff Health And Safety	28	0.34
Profitability	EPS	610	7.4	*Market*	Stock Price	28	0.34
Growth	Sales	554	6.72	*Profitability*	Net Income	19	0.23
Growth	Operating Income	297	3.6	*Unclassified*	Operational	14	0.17
Profitability	ROA	293	3.55	*Unclassified*	Debt Related	12	0.15
Profitability	Profit Margin	220	2.67	*Profitability*	Roc	9	0.11
Profitability	Earnings	190	2.31	*Profitability*	Gross Profit	6	0.07
Growth	Cashflow	157	1.9	*Profitability*	Ros	4	0.05
Profitability	FFO	127	1.54	*Growth*	Same Store Sales	4	0.05
Profitability	ROI	127	1.54	*Growth*	Same store sales	3	0.04
Profitability	EBITDA	93	1.13	*Unclassified*	Staff Relations, Engagement And	3	0.04
Growth	Gross Revenues	79	0.96	*Unclassified*	Csr	2	0.02
Unclassified	Non-Financial	62	0.75	*Unclassified*	Diversity	1	0.01
Unclassified	Vague	50	0.61				
Profitability	EVA	48	0.58		**Total**	**8,242**	

Appendix E. Instrument variable 2SLS analysis results using the alternative instruments

This table shows the instrumental variable analysis of the effect of the presence of VC director on the compensation committee on CEO risk-taking incentives (vega) and CEO pay-performance sensitivity (delta) using the non-VC backed firm sample from 1998 to 2018. First stage models present the selection equations, with the dependent variable being one of the three VC directorship variables. In second stage models, the dependent variable is the natural logarithm of CEO vega in year t+1 or the natural logarithm of CEO delta in year t+1. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. In models where the dependent variable is CEO vega, we further include CEO delta as a control. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

	CEO Vega $_{t+1}$						CEO Delta $_{t+1}$					
Stage	First	Second	First	Second	First	Second	First	Second	First	Second	First	Second
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC Director on Comp. Committee		3.480**						4.508**				
		(2.189)						(2.153)				
Number of VC Directors on Comp. Committee				3.183**						4.012**		
				(2.183)						(2.106)		
% VC Director on Comp. Committee						9.875**						12.145**
						(2.155)						(2.075)
Direct Flight -- SF	0.003		0.003		0.000		0.003		0.003		0.000	
	(0.355)		(0.332)		(0.047)		(0.352)		(0.329)		(0.044)	
Direct Flight -- BOS	0.002		0.001		-0.000		0.003		0.001		-0.000	
	(0.263)		(0.067)		(-0.142)		(0.305)		(0.113)		(-0.107)	
VC Dry Powder	-0.002**		-0.003**		-0.001**		-0.002**		-0.003**		-0.001**	
	(-2.539)		(-2.571)		(-2.358)		(-2.535)		(-2.566)		(-2.355)	
VC Dry Powder Squared	0.000**		0.000**		0.000**		0.000**		0.000**		0.000**	
	(2.510)		(2.560)		(2.420)		(2.509)		(2.559)		(2.420)	
Driving Distance -- SF	0.017		0.012		0.002		0.018		0.013		0.002	
	(0.625)		(0.415)		(0.256)		(0.665)		(0.460)		(0.295)	
Driving Distance -- BOS	-0.034**		-0.040**		-0.012***		-0.034**		-0.039**		-0.012***	
	(-2.556)		(-2.416)		(-2.599)		(-2.552)		(-2.413)		(-2.597)	
Supply of VC Executives	-0.000		-0.000		-0.000		-0.000		-0.000		-0.000	
	(-1.145)		(-0.914)		(-0.829)		(-1.176)		(-0.952)		(-0.862)	
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

State Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076	9,076
Adjusted R-squared		0.432		0.440		0.451		0.211		0.232		0.253
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-stat for Excluded Instruments		2.03		1.95		2.01		2.04		1.97		2.03
Cragg-Donald F-stat		8.22		8.19		8.88		8.38		8.34		8.99
CD Nearest Lower Critical Value		6.73		6.73		6.73		6.73		6.73		6.73
CD Nearest Lower Critical %		20%		20%		20%		20%		20%		20%
Kleibergen-Paap p-value		0.07		0.08		0.07		0.07		0.07		0.07
Sargan p-value		0.37		0.28		0.25		0.04		0.02		0.01
Sargan p-value (in a model without clustering)		0.74		0.63		0.48		0.16		0.09		0.04

Appendix F. Dynamic GMM analysis supplementary results

This table shows the first stage level regressions results for dynamic GMM estimation. See Appendix A for variable definitions. The Fama-French 48 industry fixed effects and year fixed effects are as indicated. Baseline controls include firm size, leverage, market-to-book ratio, ROA, R&D intensity, tangibility, annual stock return, annual stock volatility, firm age, CEO age, CEO tenure, CEO duality, percent independent board, the board size, institutional ownership concentration, and institutional ownership total. In models (1), (3), and (5), we further include CEO delta as a control. State controls include state educational attainment, state per-capita income, and state R&D per capita. Standard errors are clustered at the firm level. T-statistics are in parentheses. The ***, **, and * denote significance levels at 1%, 5% and 10% respectively.

Panel A. First stage level regressions results using the main instruments

	VC Director on Comp. Committee		Number of VC Directors on Comp. Committee		% VC Director on Comp. Committee	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔVC Director on Comp. Committee[t-2]	0.566***	0.566***				
	(7.572)	(7.581)				
ΔNumber of VC Directors on Comp. Committee[t-2]			0.603***	0.603***		
			(7.829)	(7.836)		
Δ% VC Director on Comp. Committee[t-2]					0.467***	0.466***
					(3.935)	(3.933)
ΔCEO Vega[t-1]	-0.003*		-0.003*		-0.001**	
	(-1.787)		(-1.932)		(-1.975)	
ΔCEO Delta[t-1]		-0.001		-0.001		-0.000
		(-0.462)		(-0.399)		(-1.170)
Min. Distance to Top 50 VC Cities	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(2.894)	(3.002)	(2.985)	(3.099)	(2.869)	(2.959)
Direct Flight to SF	-0.002	-0.002	-0.001	-0.001	-0.000	-0.001
	(-0.318)	(-0.420)	(-0.148)	(-0.263)	(-0.220)	(-0.308)
Direct Flight to BOS	0.002	0.003	0.001	0.002	-0.001	-0.001
	(0.432)	(0.500)	(0.213)	(0.288)	(-0.481)	(-0.428)
VC Dry Powder	-0.001**	-0.001*	-0.001**	-0.001*	-0.000	-0.000
	(-2.083)	(-1.874)	(-2.164)	(-1.938)	(-1.466)	(-1.295)
VC Dry Powder Squared	0.000*	0.000*	0.000*	0.000*	0.000	0.000
	(1.899)	(1.711)	(1.931)	(1.722)	(1.275)	(1.138)
Driving Distance -- SF	-0.011	-0.010	-0.011	-0.010	-0.003	-0.002
	(-0.936)	(-0.894)	(-0.923)	(-0.876)	(-0.648)	(-0.612)
Driving Distance -- BOS	-0.049***	-0.051***	-0.054***	-0.055***	-0.016***	-0.016***
	(-5.888)	(-5.991)	(-5.846)	(-5.928)	(-5.266)	(-5.335)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,164	5,164	5,164	5,164	5,164	5,164
Adjusted R-squared	0.139	0.138	0.146	0.145	0.107	0.106
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Dynamic GMM analysis using the alternative instruments

	CEO Vega $_{t+1}$			CEO Delta $_{t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)
VC Director on Comp. Committee	0.548**			0.857**		
	(2.019)			(2.126)		
Number of VC Directors on Comp. Committee		0.527**			0.855**	
		(2.165)			(2.395)	
% VC Director on Comp. Committee			1.953			2.821
			(1.457)			(1.462)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,590	8,590	8,590	8,590	8,590	8,590
Number of Firms	1,346	1,346	1,346	1,346	1,346	1,346
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
F-stat for Excluded Instruments	6.48	6.21	3.97	6.75	6.50	4.09
p-value for Excluded Instruments	0.00	0.00	0.00	0.00	0.00	0.00
p-value for AR(1)	0.00	0.00	0.00	0.00	0.00	0.00
p-value for AR(2)	0.51	0.50	0.46	0.06	0.06	0.06
Hensen J-stat	37.55	37.67	37.61	35.00	35.05	35.83
Hensen J-stat p-value	0.23	0.23	0.23	0.37	0.37	0.34

Panel C. First stage level regressions results using the alternative instruments

	VC Director on Comp. Committee		Number of VC Directors on Comp. Committee		% VC Director on Comp. Committee	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔVC Director on Comp. Committee[t-2]	0.567***	0.566***				
	(7.580)	(7.589)				
ΔNumber of VC Directors on Comp. Committee[t-2]			0.603***	0.603***		
			(7.833)	(7.841)		
Δ% VC Director on Comp. Committee[t-2]					0.467***	0.466***
					(3.938)	(3.936)
ΔCEO Vega[t-1]	-0.003*		-0.003*		-0.001**	
	(-1.754)		(-1.907)		(-1.973)	
ΔCEO Delta[t-1]		-0.001		-0.001		-0.000
		(-0.457)		(-0.396)		(-1.170)
Min. Distance to Top 50 VC Cities	0.000**	0.000***	0.000***	0.000***	0.000***	0.000***
	(2.525)	(2.604)	(2.714)	(2.796)	(2.723)	(2.794)
Direct Flight to SF	0.003	0.002	0.002	0.002	-0.000	-0.000
	(0.391)	(0.347)	(0.303)	(0.252)	(-0.098)	(-0.139)
Direct Flight to BOS	0.002	0.002	0.001	0.001	-0.001	-0.001
	(0.282)	(0.338)	(0.119)	(0.183)	(-0.490)	(-0.447)
VC Dry Powder	-0.001*	-0.001*	-0.001**	-0.001*	-0.000	-0.000
	(-1.895)	(-1.679)	(-2.025)	(-1.793)	(-1.383)	(-1.213)
VC Dry Powder Squared	0.000*	0.000	0.000*	0.000	0.000	0.000
	(1.726)	(1.531)	(1.807)	(1.592)	(1.211)	(1.074)
Driving Distance -- SF	0.008	0.010	0.002	0.004	-0.002	-0.001
	(0.475)	(0.580)	(0.093)	(0.203)	(-0.282)	(-0.203)
Driving Distance -- BOS	-0.046***	-0.047***	-0.052***	-0.053***	-0.016***	-0.016***
	(-5.657)	(-5.726)	(-5.500)	(-5.551)	(-5.107)	(-5.171)
Supply of VC Executives	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.273)	(-1.363)	(-0.779)	(-0.875)	(-0.176)	(-0.246)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,164	5,164	5,164	5,164	5,164	5,164
Adjusted R-squared	0.139	0.138	0.146	0.145	0.107	0.106
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Appendix G. Two-sample t-test on the control and treated groups in the PSM sample

This table provides the summary statistics of the control and treated groups in the PSM sample. Column (7) presents the difference between column (2) and column (5). See Appendix A for variable definitions. The ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Treated			Control			Difference
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Size (Logarithm)	394	8.12	1.44	394	7.97	1.48	0.15
Lag CEO Vega (Logarithm)	394	8.25	1.44	394	8.09	1.49	0.16
Lag CEO Delta (Logarithm)	394	1.98	1.01	394	1.94	1.12	0.05
Leverage	394	3.36	1.46	394	3.28	1.46	0.08
Market-to-Book Ratio	394	3.45	1.56	394	3.35	1.49	0.1
ROA	394	0.22	0.15	394	0.20	0.15	0.01
R&D Intensity	394	3.49	3.06	394	3.21	3.29	0.29
Tangibility	394	0.04	0.10	394	0.05	0.09	-0.01
Stock Return	394	0.03	0.04	394	0.02	0.04	0
Stock Volatility	394	0.24	0.19	394	0.26	0.20	-0.02
Firm Age (Logarithm)	394	0.13	0.46	394	0.14	0.49	-0.01
CEO Age (Logarithm)	394	0.40	0.19	394	0.40	0.21	0
CEO Tenure (Logarithm)	394	2.50	0.96	394	2.59	0.90	-0.1
CEO Duality	394	4.03	0.11	394	4.04	0.13	-0.01
% Independent Directors on Board	394	1.79	0.72	394	1.86	0.73	-0.07
Board Size	394	0.67	0.47	394	0.71	0.46	-0.04
Institutional Ownership Concentration	394	0.75	0.14	394	0.74	0.15	0.01
Institutional Ownership Total	394	9.96	2.52	394	9.59	2.30	0.37**
Fiscal Year	394	0.05	0.04	394	0.05	0.04	0
Fama-French 48 Industry	394	0.76	0.17	394	0.78	0.20	-0.02