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Abstract

We examine IPOs of startups backed by corporate venture capitalists (CVCs) and the propensity of CVC parents to establish strategic alliance with these startup firms. We investigate the differences in the governance structures of venture capital (VC) backed IPO firms. A major difference in objectives between CVCs and traditional venture capitalists (TVCs) is that CVCs often invest for strategic reasons and their parent firms frequently enter into various forms of strategic business relations with their portfolio firms which persist well beyond the IPO. We argue that such strategic alliances can have a significant impact on the governance structure of CVC backed firms, both when they go public and in the following years. Using a sample of VC backed IPOs, we evaluate several hypotheses concerning a CVC's role in the corporate governance of newly public firms. We find that strategic CVC backed IPOs have weaker CEOs and a larger proportion of independent directors on their boards and compensation committees compared to a matched sample of TVC backed IPO firms. CVC backed IPO firms also have a higher frequencies of staggered boards and forced CEO turnovers. Comparing the corporate governance of IPO firms having strategic alliances with CVC parents with TVC backed IPOs with outside strategic alliances, we find strategic CVC investors have a mean ownership stake of 16.4% compared to 2.2% for outside strategic partners and the strategic CVCs hold significantly more board seats than other strategic alliance partners, both pre- and post-IPO. Finally, these two subsamples of IPO issuers have similar frequencies of takeover defenses.

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I. Introduction

In this study we analyze the effects of strategic alliances on the corporate governance of newly public firms. Strategic alliances often suffer from a host of contracting problems, especially when they occur in highly risky industries. Financial contracts in such settings are usually incomplete because the parties can neither anticipate nor reliably observe all the possible outcomes. This challenging contracting environment can lead to opportunistic behavior by one of the two parties. For example, one party to the strategic alliance can exploit the other by exerting insufficient effort, underinvesting, or appropriating a disproportionately large share of the joint surplus created by the relation. Thus, additional mechanisms are often required in order for a strategic alliance to be initially viable and to remain so. According to the literature on incomplete contracting (see Klein, Crawford, and Alchian (1978), Grossman and Hart (1986), Hart (1988, 2001), Aghion and Tirole (1994)), equity ownership and corresponding control rights can mitigate potential hold-up problems between parties to a strategic alliance.

Given this difficult contracting environment, surprisingly few studies exist that focus on the corporate governance implications of strategic alliances. Most extant research has concentrated on whether such alliances are value-increasing (see Allen and Phillips (2000), Chan, Kensinger, Keown, and Martin (1997), Fee, Hadlock, and Thomas (2006), and Pablo and Subramaniam (2004)). Studies that do examine corporate governance effects primarily investigate the frequency of ownership and board membership by the parties to the alliance.[1] Important governance mechanisms such as board structure, CEO power and anti-takeover mechanisms are generally neglected, though they can have important implications for opportunistic behavior. There are several studies of new public firms that do examine this issue for recent IPO issuers, but without focusing on firms with strategic alliances.[2]

We undertake a detailed examination of the effects of strategic alliances that covers a broad set of corporate governance mechanisms and their evolution over time. While most of the strategic alliance studies focus on large firms, the dominant partner in these relationships, we focus on newly public firms which are particularly interesting to study because their governance structures are much more malleable. If strategic alliances are to have an effect on the governance structure of the involved parties, one would expect it to be greater and therefore easier to observe for newly public firms, especially when the newly public firm is particularly dependent on a larger and more established strategic alliance partner.

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[1] Clayton and Jorgensen (2005) and Mathews (2006) develop models where equity alliances serve as entry deterrence. Using data on biotech companies, Lerner and Merges (1998) and Lerner, Shane, and Tsai (2003) find that more control rights are allocated to the R&D firm in the alliance when outside financing is abundant.
[2] See for example Field and Karpoff (2002) and Boone, Field, Karpoff and Raheja (2007).

To examine the corporate governance implications of strategic alliances, we focus on a particular group of newly public firms – those backed by venture capitalists. Two subsamples of these firms that have strategic alliances are CVC backed firms where the CVC parent is the strategic partner and TVC backed firms where outside strategic alliance partners exist, potentially facilitated by the TVC. A distinguishing feature of CVCs is that they often invest for strategic motives, though we also find a large number of cases where the CVCs are purely financially motivated. Thus, CVCs with strategic alliance are likely to take opportunistic actions, while financially oriented CVCs are purely concerned with protecting their financial investments. These fundamentally different motivations provide us with a fertile ground to explore whether differences in investment objectives pursued by CVCs result in different governance structures for their portfolio firms. As a venture investor in a new company, CVCs might have better information and stronger control rights than the average non-VC alliance partner, thus allowing them to have a greater influence over a young firm's corporate governance.

The corporate governance of a junior partner can be of great importance to the other strategic alliance partner, which strategically oriented CVCs would often represent. Thus, CVC strategic objectives can be in conflict with the objectives of a startup firm's management and other investors, which is to maximize a startup firm's financial returns. Thus, by allowing portfolio firm managers to have wide ranging and unchecked decision making power, CVCs face substantial risks of not maximizing their own strategic and financial objectives. CVCs also face risks from an ex post hold up problem when a parent's business relationship with a startup involves specialized products or services as analyzed by Klein, Crawford and Alchian (1978). In addition, valuable strategic relations can be lost if a portfolio firm is acquired by a competitor. It is easier for VCs to control a startup before an IPO, since VC's have powerful control rights while these firms are private (Kaplan and Stromberg (2003)). However, at the time of an IPO, VCs and other pre-IPO investors relinquish most of their superior control rights. Given these concerns and the reduced influence a CVC has after an IPO, the corporate governance structure at the time a firm goes public can be of great importance to a parent of a strategically motivated CVC investor as well as other outside strategic partners.

We investigate this fundamental issue by assessing whether IPO issuers backed by strategic CVCs or TVCs where an outside strategic partner exists have distinctly different corporate governance systems than other IPO issuers backed by TVCs or financially oriented CVCs. Using a sample of 276 venture-backed IPOs from the 1992–1999 sample period, we document significant differences between the corporate governance in IPO issuers backed by strategic CVCs or having outside strategic partners and in control samples of IPO issuers lacking strategic alliances that are backed by TVCs and financially oriented CVCs.

To preview our results, we find that CVCs hold large shareholding positions in IPO issuers relative to other outside strategic alliance partners. This suggests that having a CVC affiliated strategic alliance partner is likely to have an impact on corporate governance, given a CVC's much stronger voting power in these IPO issuers. Consistent with the above predictions, we find that IPO issuers backed by strategic CVCs have stronger internal corporate governance mechanisms. Specifically, we observe that IPO issuers backed by strategic CVCs have significantly more independent directors on their boards than control samples of firms that lack strategic alliances and are backed by either TVCs or financially motivated CVCs. The differences are both statistically and economically significant. Interpreting the magnitude of these differences, our evidence suggests that one out of every four to five strategic CVC-backed IPOs has an additional independent director. Moreover, we show that this effect is invariant to the presence of other financial institutions with strong incentives for establishing good corporate governance in IPO firms such as more reputable VCs, bank VCs, and more reputable underwriters. In addition, strategic CVC backed IPOs appear to have fewer insiders on their boards' compensation committees. Examining another important element of corporate governance, we find that strategic CVC-backed IPOs tend to sell fewer primary shares at the IPO, which is consistent with strategic CVCs having particularly strong incentives to preserve their voting rights after their portfolio firms go public, and also consistent with the arguments of Williamson (1979, 1985).

Turning to external corporate governance mechanisms, we document that IPO firms backed by strategic CVCs have a higher frequency of strong anti-takeover protections (ATPs) than IPO firms backed by financially oriented CVCs. Furthermore, IPO issuers backed by strategic CVCs are more likely to adopt a staggered board, which is often considered the strongest form of takeover defence, compared to other VC backed IPO issuers. We hypothesize that strategic CVCs have incentives to support strong ATPs to help ensure the continued viability of their parents' strategic alliances, which can be threatened by a competitor acquiring control of the IPO firm and then terminating the alliance.[3] The downside associated with such takeover defenses is potentially greater management entrenchment. However, this effect can be offset by weaker management influence over the board of directors. Consistent with weaker management power, we find IPO issuers backed by strategic CVCs exhibit (1) greater board independence and (2) higher forced CEO turnover. In terms of economic significance, the results indicate that on average strategic CVC investments increase the probability of forced CEO turnover by 34%. In

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[3] This is particularly interesting, since ATPs are generally viewed as a management entrenchment device, but in this sample, it appears to entrench the board and the strategic alliance. This is consistent with the theoretical analysis of Mathews (2004) which predicts that placing equity stakes with an alliance partner can benefit both alliance partners at the expense of potential bidders.

contrast, when we compare IPO issuers backed by financially oriented CVCs with a control sample of firms backed by TVCs, we uncover no significant differences in board composition, committee membership, or forced CEO turnover.

Lastly, we compare IPO firms backed by strategic CVC investors to similar IPO firms backed by TVCs with outside strategic relationships, but having no strategic CVC backing. Our goal in this final analysis is to investigate whether strategic alliances per se lead to certain types of governance structures in newly public firms, or whether some characteristics of the strategic partners also play important roles. We hypothesize that alliance partners with more at stake (take larger investment positions) or better access to firm-specific information (board presence) are better able to influence the corporate governance structure of a startup. We document that the main difference between CVCs investing for strategic reasons and non-VC strategic alliance partners is that the CVCs generally have larger equity stakes in their alliance partners. Consistent with these differences, we find that strategic CVCs are more likely to sit on the board of their strategic partners, that these IPO firms have more independent boards and are associated with higher likelihood of forced CEO turnover and greater CEO turnover sensitivity to performance. An important similarity between these samples of IPO issuers is they both have stronger takeover defenses than other VC backed IPO issuers. This is consistent with both groups of strategic alliance partners supporting takeover defenses which protect the junior partner in the alliance from a hostile takeover by a competitor to the senior strategic partner, which could jeopardize these business relationships.

This study contributes to the existing literature in several ways. First, relying on a large amount of hand collected governance data, we explore several unique aspects of CVC investors and the importance of their strategic objectives to better understand the relationship between venture capital (VC) investment and the quality of corporate governance in IPO firms. Few studies currently exist which examine the involvement of VCs in the corporate governance of their portfolio firms. Examining the relation between CEO power and board independence, Baker and Gompers (2003) report that VC backed IPO firms have more independent boards and less powerful CEOs. Hochberg (2005) finds VC backed IPOs have more independent boards and audit and compensation committees, and are less likely to have a dual CEO/chairman. Wangsunwai (2007) finds that firms backed by more reputable VCs have more independent boards.

This study is also related to the growing literature on the corporate governance of firms recently going public. Klausner and Daines (2001) and Field and Karpoff (2002) examine anti-takeover protections, while Boone, Field, Karpoff, and Raheja (2006) study board size and composition at newly public firms. We investigate how strategic alliances and especially strategic CVC investments impact the corporate governance structures of small firms prior to going public

and in the first few years thereafter. We document that CVC strategic objectives and the strategic alliances of CVC parent firms appear to affect the structure of corporate governance in these IPO firms.

Second, the paper is related to a strand of corporate finance literature that focuses on strategic alliances (see Allen and Phillips (2000), Chan, Kensinger, Keown, and Martin (1997), Fee, Hadlock, and Thomas (2006), and Pablo and Subramaniam (2004)). These studies generally find such alliances to be value increasing. For example, Allen and Phillips (2000) find that alliances, joint ventures, and other product market relations combined with corporate block ownership lead to significant increases in target stock prices and significant improvements in their profitability and operating performance. Pablo and Subramaniam (2002) find that strategic alliances coupled with equity stakes alleviate the capital constraints of smaller, high-growth firms and these partnership announcements lead to significantly positive market reactions. Unlike the prior studies, we examine a particularly important form of strategic alliances – alliances between CVCs and newly public firms. In these relationships, CVCs invest in young privately held firms, and these relationships typically persist well beyond the IPO date. Such relations present an excellent opportunity to evaluate the existing theories concerning the structure and evolution of strategic alliances.

Third, this study sheds new light on the issue of corporate governance in strategic alliances (e.g., Aghion and Tirole (1994), Lerner and Elfenbein (2003), Grossman and Hart (1986), Hart and Moore (1988)). Hellmann (2002) suggests that if a startup is a strategic complement to a corporation, then the startup would be better off being financed by a CVC. If CVCs and TVCs have distinct abilities, Hellmann's model predicts that CVCs would have board seats and would actively provide support to the startup. While previous studies of corporate governance focus on the equity stakes and board participation of the alliance partners, we undertake a more comprehensive examination, which includes board structure, CEO power and anti-takeover mechanisms. CVC investment activity offers an important opportunity to study corporate governance in strategic alliances since CVC parent companies are indirectly major investors in startups, thereby giving them the major opportunity to strongly influence the development of corporate governance in these young firms.

The paper is organized as follows: Section II sets forth the hypotheses we are going to test, Section III describes the data used in the analysis, Section IV presents the empirical results, Section V analyzes strategic CVC investments versus general alliances, and Section VI concludes.

II. Testable hypotheses

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In this section, we present several hypotheses regarding the role of CVCs in the governance of newly private firms. Corporate VCs, although in the same general line of business as traditional VC firms, are distinctly different in a number of important dimensions. They have different investment objectives and incentives as well as different organizational and compensation structures. These differences have an important impact on their performance (see Gompers and Lerner (2000) and Santhanakrishnan (2002)), as well as their ability to add value to startups (Ivanov and Xie (2006) and Chemmanur and Loutskina (2007)). We also argue that CVCs have different incentives from TVCs when structuring the corporate governance systems of startup firms going public. More specifically, we examine what governance mechanisms CVCs use and how these differ between CVC-backed and TVC-backed IPOs.

A distinctive feature of VC investors is that they hold large equity stakes and obtain significant control rights in the startups they finance. This is a way for them to manage the significant risks, moral hazard problems and uncertainties associated with venture investments. Previous studies (see Lerner (1995), Kaplan and Stromberg (2003, 2004)) document that the strength of a VC's control rights is inversely proportional to a startup's performance. VCs gradually relinquish these rights as the startup's performance improves and it nears an IPO. The IPO event represents a shock to the governance systems of startups since the powerful control rights of VCs disappear as their convertible preferred stock with its enhanced control rights is forced to convert into ordinary shares. Also, prior to going public, private firms usually restructure their corporate governance to meet exchange listing and disclosure standards and also to become more attractive to outside investors. As major pre-IPO investors, CVCs have significant influence over a start-up firm's choice of governance systems.

To enhance both their expected returns and private equity reputations, VCs have incentives to set up effective corporate governance systems before startups go public. VCs raise new funds usually every three to four years. This means that very frequently they must find investors (limited partners) willing to commit capital to their new VC funds. However, investor interest is strongly related to the performance of the VC's previous funds. VCs typically realize their highest returns when they take portfolio firms public. However, VCs do not exit from their companies on the IPO date; they usually must wait for a 6 month lock-up period to expire, which underwriters typically require of all private equity investors. Interestingly, VCs frequently keep a portion of their equity stake even after the IPO lockup period expires (Barry, Muscarella, Peavy, and Vetsuypens (1990)). Thus, VCs need to ensure that their portfolio firms have good governance systems in place when they go public in order to protect the value of their on-going investments in these firms.

Like other VC investors, CVCs repeatedly access the IPO market by bringing young portfolio companies public and their reputations affect the willingness of investment bankers to underwrite these IPOs. If CVC-backed IPO firms are known to have poor performance, then future IPOs backed by these same CVCs are likely to experience weak investor and underwriter interest. To preserve their reputational capital, CVCs have incentives to implement good governance systems in the startups they finance. In addition, CVCs have to wait for the lock-up periods to expire to cash out of their positions. Hence, CVCs like TVCs have similar incentives to ensure that their portfolio firms have good governance systems in place before going public.

CVCs also have an additional incentive to establish effective governance mechanisms to curb managerial entrenchment and private benefits of control. Unlike TVCs, CVCs primarily invest for strategic reasons. As a result, they often enter into formal or informal strategic or business relationships with their portfolio firms, which tend to last for a number of years after these firms go public and these business relationships can offer important strategic as well as financial benefits to CVC parent corporations. Strategic alliances can be plagued by a host of contracting problems in highly risky industries in which CVCs usually invest. This information contracting environment can lead to opportunistic behavior by one party which exploits the other by exerting insufficient effort, underinvesting, or appropriating a disproportionate share of the joint surplus created by the relation. The literature on incomplete contracting (see Klein, Crawford, and Alchian (1978), Grossman and Hart (1986), Hart (1988, 2001), Aghion and Tirole (1994)) concludes that equity ownership and its associated control rights can be used to mitigate potential hold-up problems between strategic alliance partners, which in our case are CVC parents and startups.

As strategic investors, CVCs have incentives to seek greater control rights than other investors because they have more to loose due to their strategic objectives. CVCs are motivated by financial considerations as are TVCs. However, they obtain financial gains from two sources (1) the financial gains of the startup investment and (2) the financial benefits of the parent's strategic business relationship with the startup. CVC parents can be hurt if the startup's management is unwilling to pursue operating and investment decisions that are complementary or at least not damaging to the CVC parent's or if the startup is acquired, which could threaten its commercial relationships with the startup. CVCs generally have important strategic objectives that can be consistent with, independent of or in conflict with the goal of maximizing the financial returns from their equity investment in the startup. Since, manager incentives are generally aimed at maximizing the portfolio firm's financial returns, strategically oriented CVCs are taking greater risk when they allow startup firm managers unchecked decision making power. Thus, CVCs have incentives to seek greater decision making power in startups than other VCs

and to limit startup management influence by establishing effective corporate governance systems that can help protect their strategic goals after a startup goes public, and they lose their special control rights.

It should also be recognized that there can be conflicts of interest between CVCs and TVCs. TVCs and entrepreneurs often have the same objective – maximizing the financial returns of their investments. This financial objective can conflict with the strategic objectives of CVCs. Thus, entrepreneurs might rely on TVCs for protection against unchecked CVC power. Hellmann's (2002) model predicts that a startup entrepreneur will prefer TVC investors over CVC investors, unless the CVC parent sells complementary products or services. Hence CVCs might prefer to work with weaker, less reputable TVCs when they invest for strategic reasons since this would enable them to have greater influence over major decisions such as a startup's corporate governance mechanisms and potential exit strategies. On the other hand, CVCs can benefit from co-investing with reputable TVCs. VC syndication can lead to better deal flow and screening of potential venture investments, larger pools of capital, risk sharing, and more private equity contacts to help develop startup operations. The fact that TVCs have an incentive to support efficient governance structures that will help ensure that managers do not behave opportunistically also helps protect CVC strategic investments. Aghion and Tirole (1994), in their model of the organization of R&D activity, show that it is optimal for CVCs ("customer" in their model) to have TVCs as co-investors since it can help raise CVC profits. Thus, syndication with TVCs can be beneficial for CVCs (both from a strategic and financial viewpoint) and can also alleviate entrepreneurial concerns about being expropriated by CVCs.

Given the difference in investment strategies between CVCs and TVCs, we conjecture that important differences will be observed in the corporate governance of CVC-backed and TVC-backed IPO firms. More importantly, we argue that such differences will be especially pronounced for *strategic* CVC investments. Unlike financially motivated CVCs, strategic CVCs hold relatively large equity stakes in their portfolio startups, and thus they are in a much better position to affect the corporate governance systems of startups before these firms go public. Given the impact of an IPO on a VC-backed firm's corporate governance, strategic CVCs may set up certain governance mechanisms pre-IPO to ensure that their interests continue to be protected. On the other hand, significant differences between the governance systems of IPO firms backed by financially oriented CVCs and those backed by TVCs are unlikely. This follows since financially oriented CVCs have incentives very similar to TVCs to support corporate governance mechanisms that maximizing the financial returns on their equity investments in startups.

We propose several hypotheses, which are empirically evaluated in the next section. We test the validity of these hypotheses against the null hypothesis that CVC backing (for strategic

reasons or purely financial reasons) has no additional impact on the governance systems of VC-backed IPO issuers. CVCs can be just one more venture investor and in most cases they are not even lead VC investors. One possibility is that the VC syndicate as a group (or the lead VC) determines the governance structure of the firm, so that even when a strategically motivated CVC is in the VC syndicate, its marginal role is very minor and not easily detected empirically. Another possibility is that other financial intermediaries have a much stronger effect on corporate governance than CVCs making strategic investments. In addition, some startups are financed by bank VCs. As Hellmann, Lindsey, and Puri (2007) show, bank VCs often invest in such young, high growth firms to establish lending relationships. In such situations, they might also have incentives to support effective corporate governance, thus ensuring that these firms would be more reliable borrowers. Also, when a portfolio firm goes public there are investment banks involved. They presumably also have strong incentives to take public firms with good corporate governance. In addition, anecdotal evidence suggests that CVCs often do not actively monitor their portfolio firms[4].

Our first hypothesis focuses on how quickly different types of VC firms unwind their equity holdings following IPOs. Since strategically oriented CVCs have an incentive to continue monitoring their portfolio firms beyond the IPO, we conjecture that CVCs on average hold equity positions post-IPO for longer periods than TVCs. We formally state this in the following hypothesis:

H1: Strategically motivated CVCs (1) will hold a larger percentage of equity relative to managers, (2) support smaller percentages of new shares in IPOs to minimize dilution of their voting rights, and (3) will hold equity positions in VC-backed IPOs for longer period of time than financially motivated CVCs or TVCs.

We also expect CEOs in IPO firms to exercise less power relative to strategic CVC investors, who should demand more board power relative to management. Consistent with the arguments in favor of a less powerful CEO, we expect strategic CVC investors in IPO issuers to have much greater incentives to push for more independent directors on these boards and their key committees than other VC investors because they have greater financial benefits (i.e. both financial returns on the startup investment and to protect the parent's economically beneficial

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[4] Our analysis of strategic CVC investments suggests that CVCs tend to invest in earlier rounds, which provides some support to the argument that CVCs have a significant influence on the governance of startups.

strategic relationship). More independent directors on the board will constrain CEO power, limit managerial entrenchment, and better protect CVC interests in strategic alliances.

While VCs have superior control rights before a firm goes public, at the IPO date, most of these superior rights end because most of these rights are tied to their preferred stock, which is automatically converted into common stock at the IPO. So they are primarily left with their board power, which could still be far above their cash flow and voting rights. This creates added incentives for VCs, and CVCs in particular, to be especially concerned with the composition of the board prior to the IPO date. In addition, we expect strategic CVC backed IPOs to employ fewer gray directors (independent directors that have some commercial or financial relationship to the firm) since they are more susceptible to CEO influence. For the same reason, CVCs should demand that an independent, non-executive officer be chairman of the board. This analysis can be summarized in the following hypothesis:

H2: IPO issuers backed by strategic CVC investors are likely to have (1) a greater percentage of independent directors on the board and its key committees (2) a smaller percentage of gray directors, (3) a smaller percentage of inside directors and (4) fewer incidences of CEO/Chairman duality) than IPO issuers without outside strategic alliances backed by TVCs or purely financial oriented CVC investors.

It is well known that many IPO firms are acquired soon after going public (see *Daily Deal*, March 22, 2000). In addition, Dai, Anderson, Bittlingmayer (2006) reports that VC-backed IPO firms are more likely to be acquired in the first few years after their IPOs compared to non-VC-backed IPOs. However, early acquisitions can be undesirable for CVC parents because they can jeopardize their valuable strategic relationships with these startups. Thus, CVCs and outside strategic partners are likely to support establishing strong defenses prior to these firms go public. This raises a puzzling question. Why would TVCs go along with the CVC desires for suboptimal governance features? One plausible explanation is that TVCs initially benefit from bringing a CVC on board as a venture investor because this can lead to a CVC parent establishing a valuable strategic relationship with a startup that increases its probability of survival and of a highly profitable IPO. This can more than offset the later cost of CVC investors pushing for stronger takeover defenses and greater CVC board power, which by themselves could represent suboptimal corporate governance features, which lowers the value of an IPO and its subsequent stock price.

A large arsenal of anti-takeover provisions exists to protect firms from unwanted bidders. Arrangements such as staggered boards, limits on voting rights, limits on shareholder

amendments to bylaws and the charter, supermajority requirements and poison pills are known to protect the board from being quickly replaced. However, Bebchuk, Cohen, and Ferrell (2005) argue that these arrangements are some of the most important preemptive legal takeover defenses available and they report convincing empirical evidence supporting this conclusion. Bebchuk, Coates, and Subramanian (2002) argue that staggered boards are the most important takeover defense and provide strong empirical support for this position. Field and Karpoff (2002) study the frequency of takeover defenses in IPO firms, but fail to find a significant effect of VC backing. However, they do not distinguish between CVCs and TVCs, nor do they distinguish between strategic and financial CVC investors, which we argue are crucial distinctions. We formalize the above analysis in the following hypothesis:

H3: IPO issuers backed by strategic CVC investors are likely to have stronger takeover defenses, especially staggered boards, than IPO issuers without outside strategic partners backed by financially oriented CVCs or TVCs.

Strong takeover defenses also have a negative side in that they help entrench managers by insulating them from the market for corporate control. This could have adverse effects on a CVC parent's in economic interests. Thus, CVCs need to support governance features that offset these managerial entrenchment effects. This leads to another important consequence of having strategic CVCs and their relative power with respect to senior management is predicted to be greater than other VC investors and thus, raises the likelihood of forcefully replacing a startup's CEO. This is one of the key decisions that the board makes and it has long-lasting repercussions for the firm's investment and financing policies and performance.

While CEO forced turnover is not a corporate governance mechanism, differences in CEO forced turnover are an outcome of corporate governance differences. We use this evidence to further assess the economic importance of board composition differences observed in CVC-backed IPO firms relative to TVC-backed IPO firms. Since managerial opportunism could endanger the benefits of their long-term strategic relationships, we expect that CVCs will use their board power and try to replace CEOs who exhibit poor performance or tries to act opportunistically toward the CVC parent or who extracts excessive private benefits. H2 suggests that it would be easier to displace a CEO in a firm backed by a strategic CVC since CEO board power is weaker in these firms. This is a prediction that we test directly by examining CEO turnover over the post-IPO period.

H4: Forced CEO turnover and greater forced CEO turnover sensitivity to firm performance are more likely in IPO issuers backed by strategic CVC investors relative to IPO issuers without outside strategic partners backed by TVCs or financial CVCs

Lastly, we compare IPOs backed by strategic CVCs to IPOs backed by TVC with strategic alliance partners that are not VCs. On first glance, these are all firms that engage in similar types of strategic alliances – hence one would expect to observe similar governance structures. However, unlike other strategic alliance partners, strategic CVC have equity stakes in startups which are relatively large (an average of 20.7% versus 2.8% before the IPO). It follows that strategic CVCs are likely to have larger board representation in startups, more independent boards and weaker CEO board power. Board representation also gives CVCs better access to proprietary information and a much stronger position from which to push for startup corporate governance systems they prefer prior to an IPO. Startups backed by CVCs are also likely to exhibit stronger takeover defenses given the importance of these strategic relationships to the CVC parents, suggested by their large shareholding positions. We conjecture that IPOs backed by strategic CVCs have distinctly different governance structures than those backed by non-VC alliance partners as specified below.

H5: IPO firms backed by strategic CVC investors are likely to have (1) a greater percentages of independent directors on their board and its key committees, (2) a smaller percentage of gray directors, (3) a smaller percentage of inside directors, (4) fewer incidences of CEO/Chairman duality), and (5) stronger takeover defenses than IPO firms backed by TVCs with strategic alliance partners.

Strategic relationships also improve the profitability and survival probability of startups by providing them with access to specialized resources early in their lives and by offering them more reliable customer and supplier relationships than IPO firms backed by other VCs. The access to specialized resources and strategic business relationships could also lead to higher growth rates relative to other VC backed firms. Given their stronger ATPs, strategic CVC backed firms are also less likely to be acquired. Strategic CVCs are also unlikely to *Grandstand* since they gain little in reputation by rushing an IPO, while this can financially damage a CVC parent's strategic relationship with these startups, which also increases the survival probability of firms CVCs back.

H6: IPO firms with strategic CVC backing are less likely to be delisted due to financial distress, more likely to be profitable and have higher growth rates and less likely to be acquired.

We now turn to our methods for testing the predictions of these six hypotheses and the resulting evidence.

III. Data

The data for this study comes from Thompson Financial's VentureXpert database and Jay Ritter's IPO website, http://bear.cba.ufl.edu/ritter/ipodata.htm. We begin by extracting all the VC-backed IPOs listed on a major US exchange in the 1992-1999 period. There are 138 IPO by US firms having VC investments by US corporations in this sample period (CVC backed IPOs). The IPOs in our sample are backed by VC arms of some of the biggest and most respected US corporations, such as Microsoft, Intel, GE, Cisco Systems, AOL, and Xerox. Because the motives of CVC investors can vary substantially, we classify each of the 138 CVC IPOs into strongly strategic or purely financial objectives. The classification is based on information provided in offer prospectuses, annual reports, and other corporate filings.

When a CVC parent has a strategic alliance, joint development agreement, joint venture, licensing agreement, or similar arrangement with the IPO firm, we classify the CVC investment as strategic. Similarly, if the prospectus explicitly states that there is a customer/supplier relation between the CVC and the IPO firm, we also classify this as a strategic CVC investment. When a CVC has no strategic alliances with the firm, we classify it as a purely financial investor. This classification scheme yields 94 strategic CVC investments and 44 purely financial CVC investments. Of course all of these CVC backed IPOs also have TVC investors as well.

Since TVC-backed IPOs are more frequent than their CVC-backed counterparts, we select a control group of 138 TVC-backed IPOs with no CVC investors or outside strategic corporate partners, in the same industry (measured by three- and four-digit SIC codes) and of similar size (pre-IPO sales within 50%-150% of those of CVC-backed IPOs) to the CVC-backed IPOs. Our control firms are also close in terms of IPO dates – with the mean difference in IPO dates of the CVC-backed IPOs and corresponding TVC-backed matches is 1.2 years, and a median of 0 years. For each IPO in our sample, we collect data on ownership, management, and board structure from the IPO prospectus and proxy statements for the five years after the IPO. The identities of the participating VCs are taken from VentureXpert. In our analysis, we take into account the panel data characteristics of our sample by estimating firm fixed effects and random effects models. Our final sample has 1,240 firm-year observations by 276 IPO firms.

Table 1 reports summary statistics for our VC-backed IPO sample. Compared to other IPO studies, most IPOs in our sample are in high-tech industries – business services, computers, electronics, and biotech. This is not surprising given VC preferences for investing in newer, high-growth industries. Our IPOs are roughly half the size of the Baker and Gompers (2003) sample, though they report asset values in the IPO year, which includes the effect of the equity offering, while we report asset values for the calendar year prior to the IPO date and draw our sample from a more recent time period. In addition, strategic CVCs invest in IPO issuers that are younger and smaller than their financial CVC counterparts. However they are able to obtain higher IPO proceeds – their median proceeds are $43 million compared to a median value of $39 million for IPOs backed by financial CVCs. This is consistent with the finding of Ivanov and Xie (2006) that strategic CVC-backed IPOs have higher valuations than other VC-backed IPOs. Compared to their matched firms, strategic CVC-backed IPOs, besides having larger IPO proceeds, are backed by more prestigious underwriters. We find similar patterns in the subsample of financial CVC-backed IPOs. This sample of IPO firms tends to be older and have larger proceeds than their matched TVC-backed firms.

We also document the various types of relationships that exist between the parents of the CVCs making strategic investments and their portfolio firms. As Table 1 shows, the joint product development alliances where both the startup and the CVC parent put up resources for the development of a product are the most common strategic relationship. In addition, CVC parents are often suppliers and customers of their portfolio firms. These types of alliances, unlike marketing and distribution agreements, are subject to potentially serious hold-up problems described in Klein, Crawford, and Alchian (1978).[5] This underscores the need for contracting mechanisms, such as equity ownership and board power, which can alleviate such problems.

IV. Empirical results

Panels A and B of Table 2 present summary statistics for the subsamples of strategic and financial CVC-backed IPOs, respectively. Table 2 shows that IPOs affiliated with strategic CVCs on average have a higher equity ownership level and a longer holding period than financial CVCs. Median equity holdings of financial CVCs are essentially zero after year 1, while those of strategic CVCs do not fall to zero until the 4th or 5th calendar year after the IPO. Tests for equality of medians (not reported here for the sake of brevity) suggest that the equity ownership of strategic CVCs is significantly higher than that of their financially oriented CVCs from year -1 until year 3, where year 0 is the IPO year. A similar conclusion can be made about board

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[5] Marketing and distribution agreements often accompany product development and customer-supplier relations.

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participation in the cases of strategic and financial CVC investors. Strategic CVCs tend to have more directors, although the differences disappear after year 3. Tests show that strategic CVCs hold significantly more board seats than financially oriented CVCs in the first three years. These findings are consistent with the predictions of H2, which is based on strategic CVC directors having more to gain from maintaining active involvement in the IPO firm for a longer period.

Table 2A also shows equity ownership in startup of strategic CVCs and in matched firms by TVCs continues until year 5 and CVC median equity holdings are positive through year 3. The ownership stake of TVCs is significantly higher than that of CVCs, but this is due to the fact that we report cumulative ownership of all TVCs investing in a given company. An important implication of the comparisons that can be drawn from Table 2A is that strategic CVCs do not appear to maintain post-IPO shareholdings longer than TVCs. Therefore, the results do not provide any support for H1. These findings are also interesting in light of the potential conflicts of interest between TVC objectives and CVC strategic objectives in terms of suboptimal governance mechanisms. The fact that TVCs have relatively more board and voting power plus lead syndicate status gives them some protection from CVC actions. However, TVCa may acquiesce to these actions benefiting CVCs to encourage their VC syndicate participation, given that their parents can provide valuable strategic opportunities to future startups.

Table 2B suggests that there are no significant differences in CEO ownership between strategic and financial CVC backed IPOs and their control firms.[6] However, strategic CVCs on average have higher share ownership stakes than CEOs in years -1, 0 and +1, while financial CVCs have higher equity stakes than CEOs only in years -1 and 0. Also, CEO share ownership is significantly larger than financial CVC share ownership after year +1 and larger than strategic CVCs after year +3. These findings provide some support for H1 that strategic CVCs tend to have higher ownership than CEOs, even after an IPO.

Comparing the frequency of gray directors and CEO/Chairman duality between CVC-backed and TVC-backed IPOs or between strategic CVC-backed and financial CVC-backed IPOs, we do not find any significant differences. As can be seen from Table 2A and 2B, the percentage of gray directors is very small, with the median equal to zero in almost every year. Similarly, the CEO/Chairman duality is uncommon in our sample. These findings do not provide support for H2. However, these samples of IPOs can have quite different characteristics, which should be controlled for through a multivariate analysis.

Lastly in Table 3A, we investigate whether firms with strategic CVC backing tend to sell fewer shares in their IPOs. This is one way for the CVCs to preserve their voting power and

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[6] In untabulated results, we also find no significant differences in CEO tenure across these same subsamples of IPOs.

influence over the startup and limit potential hostile bids. A smaller IPO issue means less dilution of CVC voting rights. We compare the ratio of primary shares sold at the IPO to shares outstanding before the offering. The information on pre-IPO shares and primary shares sold at the IPO comes from SDC's New Issues database. In some cases the information on pre-IPO shares is missing, so we use information from IPO prospectuses to supplement the missing SDC data. In univariate analysis, we find that firms with strategic CVC backing sell a smaller percentage of new shares at the IPO than both their matching firms and IPO issuers backed by financially oriented CVCs. The median fraction of primary shares in strategic CVC backed IPOs is 26.1%, which is significantly smaller than that of their matching IPO issuers with TVC backing (37.2%) and that of IPOs backed by financially oriented CVCs (31.6%).

In Table 3B, we investigate the percentage of primary shares issued using a regression framework to control for the effects of other differences in IPO characteristics. We regress the percentage of primary shares on a number of firm-specific and offer-specific variables and CEO characteristics. The results again show that strategic CVC backed IPOs sell a significantly smaller percentage of primary shares compared to other VC backed IPOs. In all the specifications, the *Strategic* CVC indicator is negative and significant. These results support H1: CVCs making strategic investments are more interested in preserving their voting rights after their portfolio firms go public.

IV.A. Board composition

We view board structure to be the result of bargaining between CEOs and independent investors, in the spirit of Baker and Gompers (2003). CEO power over the board of directors is measured by the percentage of the board represented by startup officers (inside directors). Inside directors have strong incentives to support a CEO's positions in board decisions since any lack of loyalty could result in the officer being fired by the CEO. We find that strategic CVC-backed IPOs have relatively more independent directors on their boards. Our measure of independent directors excludes gray directors. As Table 2A shows, the difference in the median percentages of independent directors is significant for strategic CVC-backed firms and their TVC backed control firms in the IPO year (the median percentage of independent directors in strategic CVC-backed firms is 73.2%, compared with 71.4% for the control sample) as well as in four of the five post-IPO years. In contrast, the number of independent directors on boards of financial CVC-backed IPOs is similar to that of their TVC-backed control firms in the IPO year and the following 4

years.[7] We also find a significantly smaller fraction of insider directors in strategic CVC-backed IPOs than in (1) their TVC-backed matching firms or (2) financial CVC-backed IPOs.

While outside directors are likely to exhibit greater independence from the CEO, gray directors are an important exception. These are directors who are related to the CEO, executives in other firms that sell goods and services to the firm in question, interlocking directors, or directors that have personal contracts with the firm or its subsidiaries. These directors have special incentives to support the CEO's positions in board deliberations due to their familial, financial or business connections. Thus, we categorize outside directors as either (1) gray directors or (2) independent outside directors (non-gray directors).

Tables 4A and 4B presents estimates from pooled cross-section time series regressions of the percentage of independent directors with heteroscedastic robust standard errors adjusted for firm clustering. The explanatory variables include several CEO characteristics (age and tenure) and indicators for CEOs who are either a founder or a chairman of the board to capture CEO influence on the board.[8] We also control for several firm characteristics including firm size, age, research intensity, cash flows, underwriter reputation and VC reputation. In selecting these variables, we follow Baker and Gompers (2003) and Boone, Field, Karpoff, and Raheja (2006). As a VC reputation measure, we use age of the lead VC management firm, where a lead VC is defined as the VC with the earliest investment in the IPO firm. If there are two or more VCs at the initial round, we select the VC with the largest investment as the lead VC.[9] The number of observations included in the regressions can be smaller than 1,240 because some firms do not have data on research intensity and cash flows. In Tables 4A and 4B, we report both firm fixed effects and random effects models, where firm level heterogeneity is assumed to be time-invariant in both models.

Model 1 of Table 4A includes an indicator for strategic CVC investors. The coefficient on the strategic CVC indicator is positive (0.028) and statistically significant at the 5% level. This indicates that the presence of a strategic CVC investment increases the proportion of independent directors by roughly 5%. Interpreting this coefficient estimate's economic significance, we find that that one in every four strategic CVC-backed IPOs has an additional outside director (given that the average board of our IPO sample has approximately seven members, of which about five are independent directors). In addition, we document that the fraction of independent directors on the board is decreasing in cash flows as a fraction of sales, confirming the findings of Baker and

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[7] Another group of outside directors who may lack independence from the CEO are former officers and employees of the firm.
[8] All of the variables are defined in Appendix A.
[9] We used alternative definitions of lead VC (the VC with the largest equity stake and the VC with the longest board membership) and reputation measures (amount of capital under management, number of firms taken public, etc.) and found qualitatively similar results.

Gompers (2003). We also find that the fraction of independent directors is negatively related to CEO ownership, supporting the findings of Boone et al. (2006).

In Model 2 of Table 4A we include an indicator variable that equals one if there is a strategic CVC investor, who also serves as the VC syndicate lead investor. We investigate whether lead CVCs have a stronger influence on corporate governance mechanisms adopted by the firm prior to going public. The coefficient on the strategic CVC indicator is 0.029 and is significant at the 5% level, which indicates that IPO firms with strategic CVC investors are positively associated with larger fractions of independent directors. However, there is no significant marginal effect when the CVC is also a VC syndicate lead investor.

In column 3 of Table 4A we add company and year fixed effects to better account for the statistical properties of our panel data. The results are again similar to what we find with the previous two models. The strategic CVC coefficient is 0.048 and significant at the 5% level. In column 4 of Table 4A, we estimate a random effects GLS model, where the unobserved firm heterogeneity is treated as being distributed independently of the regressors. The main benefit of this approach is that it yields consistent estimates of all the parameters, including the time-invariant regressors, such as the *Strategic* CVC indicator. The results mirror those in the previous specifications. In column 5 of Table 4A, we take account of the dependent variable being bounded by 0 and 1, with a generalized linear model, which is specifically designed to deal with fractional response data (see Papke and Wooldridge (1996)). This model uses a logit transformation of the dependent variable so that it maps onto the real line. The estimation results show that the *Strategic* CVC coefficient continues to be positive (0.134) and significant at the 5% level (t-stat of 2.06). Thus, analysis of this table indicates that strategic CVC-backed IPOs have a larger fraction of independent directors than other VC-backed IPOs, and this difference is both statistically and economically significant. Thus, the results supports hypothesis H2.

It should be noted that while all VCs are likely to support weaker CEO board power, other VCs would not necessarily support giving strategic CVCs more board power. To test whether the presence of other VCs restricts CVC board power, we estimate a regression model where the dependent variable is a proxy for a CVC's excess board power (we use the proportion of CVC board seats to CVC shareholdings). In unreported regressions we find that excess board power of strategic CVCs is decreasing in the shareholdings of other VCs. Hence, other VCs participating in the syndicate appear to reduce CVC board power.

One alternative explanation for our board composition results is a reverse causality argument that strategically oriented CVCs simply select startups with more independent boards. If this is the case, then the residuals in our regressions will be correlated with the *Strategic* CVC indicator, thus leading to biased coefficients. We address this selection bias concern in several

ways. First, we include in the analysis only strategic CVC-backed IPOs that received their first corporate venture investments at an early stage of their life. Thus, board structure is likely to be much malleable and subject to substantial change prior to going public. The results are reported in the second column of Table 4B. The coefficient on *Strategic* continues to be positive (0.043) and statistically significant (t-stat=2.20). Second, we run a regression on only IPOs (both CVC- and TVC-backed) that receive their first round of CVC (for CVC-backed firms) or TVC (for the matching firms) financing at an early stage of their life cycles. Early-stage startups should have the highest degrees of uncertainty and information asymmetry about both their future prospects and governance characteristics. The results from this subsample of IPOs are presented in Model 2 in Table 4B. The *Strategic* CVC coefficient is again positive (0.44) and significant (t-stat=1.94).

Third, we address the endogeneity of CVC investments by using an instrumental variables (IV) approach. We use three variables as instruments for strategic CVC investing: aggregate CVC investment as a portion of aggregate VC investment in the year prior to when the startup received its first VC investment, the stage at which an IPO receives its first VC investment (early or late), and the average number of companies that the VCs investing in the startup have previously taken public. These three variables are significantly correlated with the *Strategic* CVC indicator, but are not significantly correlated with the dependent variable. The Hansen-Sargan test of the overidentification restrictions cannot reject the null that the instruments satisfy the required orthogonality conditions (p-value=0.78), indicating that these three variables are valid instruments. The results from the IV regression are reported as Model 3 of Table 4B. The *Strategic* CVC coefficient remains positive, but is higher than in the previous specifications (0.209) and statistically significant (t-stat=1.86). Thus, our earlier result of greater board independence for CVC backed firms continues to hold, even after controlling for the endogeneity of CVCs initial investment choices.

We also investigate the effect of endogeneity of the CEO/COB decision. One plausible scenario is that a CEO is more likely to be a chairman if the board is less independent. This could explain the positive and significant coefficients on this variable in the prior analysis. To control for this potential endogeneity, we again employ an IV regression, in which we instrument for CEO/COB using the CEO/Founder variable. The results of this logit regression are shown in the last column of Table 4B. The coefficient estimate on the instrumented CEO/COB variable continues to be positive, though it is no longer statistically significant. More importantly, the *Strategic* CVC indicator remains positive and significant.

Lastly, we run a battery of robustness tests, which are presented in Table 4C. First, since CVCs often end their relationship with IPO firms within the first 5 years after going public, we include in our analysis only firm-year observations prior to the CVC's departure. We assume that

a CVC departs when it no longer has an equity stake or a board seat in the firm. The results from this model are qualitatively similar to the results in Table 4A. We also use median regressions (Model 2) and find that the *Strategic* CVC coefficient remains positive and significant. Third, due to the fact that there are other financial institutions investing in these IPOs and they could also have a significant impact on the IPO firm's corporate governance, we control for the presence of reputable underwriters and bank VCs. We can see from Model 3 of Table 4C that the presence of reputable underwriters and bank VCs is associated with a significantly higher fraction of independent directors on the board. Both coefficients are positive and significant. This is an interesting result in the light of our earlier discussion of the incentives of other financial institutions co-investing with CVCs. This evidence is consistent with bank VCs having incentives to support better governance systems in their IPOs since they could be future lenders to these firms (see Hellmann, Lindsey, and Puri (2007)). However, one has to be careful in interpreting the results since we do not know whether underwriters and bank VCs actually influence board independence or whether the relationship is due to reverse causality and the underwriters and bank VCs select firms that already have more independent boards.

In the last model in Table 4C, we test for the importance of inside representation on the board. The inside director measure we use includes gray directors, but excludes CEOs.[10] The coefficient on *Strategic* is -0.029 and has a t-statistics of -2.07. This evidence suggests that strategic CVC-backed IPOs also have fewer insider directors, consistent with the predictions of Hypothesis H2.[11]

IV.B. Board committees

The board generally establishes several committees to provide oversight on top management and to actively participate in the governance of the corporation. The most important committees are audit, compensation, and nominating (Hochberg (2005)). The audit committee usually makes recommendations to the board regarding the selection of independent auditors, reviews the financial results and the scope of the audit services provided by independent auditors, and reviews and evaluates the company's internal control functions. The compensation committee decides on and evaluates compensation packages for employees, including the CEO and administers the company's stock plans. The nominating committee recommends candidates for senior management positions as well as for election to the board of directors. The proportion of independent directors on these committees is another measure of the power balance between the

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[10] We obtain qualitatively similar results if we include the CEO as an inside director.
[11] In unreported regressions we also control for management, VC, and CVC shareholdings, board seats of strategic CVCs, and whether CVC ownership is less than that of TVCs. The coefficients on these variables are not statistically significant.

CEO and outside investors. H2 predicts that the key committees of IPO firms with strategic CVC investors have a majority of independent directors. While all of the IPOs in our sample have audit and compensation committees, the majority of them do not have a nominating committee. However, it should be noted that the lack of a nominating committee is likely to give a CEO greater influence over board nominations and we treat this as the case.

We first examine the composition of audit and compensation committees using a probit model specification. The dependent variables are respectively equal to one if the audit or compensation committee is composed entirely of independent directors at the IPO, and zero otherwise.[12] Independent directors exclude outside gray directors. We use a similar set of control variables to those used by Klein (1998 and 2002) in her analysis of board committee composition. We also include *Strategic CVC* to capture the effects of a strategic CVC investor.

The estimates from the probit model are presented in Table 5. The first model analyzes compensation committee composition. The *Strategic* CVC indicator has a positive coefficient of 0.44, which is significant at the 5% level (Z-stat=2.07), which we interpret as showing greater compensation committee independence when the firm has a strategic investor. The result is also economically significant. The presence of a strategic CVC investor increases the probability of an independent compensation committee by roughly 10%. Of the other explanatory variables, only the log of CEO age is positive and significant. Thus, it appears that strategic CVC-backed companies have an important bearing on the independence of compensation committees. Further tests reveal that the impact of strategic CVC investors on the composition of the compensation committee remains significant one year after the IPO (*Strategic* has a coefficient of 0.50 with Z-stat=2.42). In contrast, we do not find that CVC backing has a significant impact on audit committee composition. We also examine whether having a CEO on the compensation or audit committee is less likely is with strategic CVC investors, but do not find any significant effects.[13]

As an additional test of CEO power, we examine whether a firm has a nominating committee independent of the CEO at the IPO. The dependent variable is equal to one if the firm has a nominating committee, and zero otherwise.[14] In this analysis, we exclude the *CEO Founder* indicator because it perfectly predicts the lack of a nominating committee. As the last regression in Table 5 suggests, strategic CVC-backed firms are more likely to have a nominating committee, but the coefficient on the *Strategic* CVC indicator is not statistically significant.

IV.C. Anti-Takeover Protection

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[12] As an alternative test, we only require a majority of committee members to be independent and obtain qualitatively similar results.
[13] This lack of significance may reflect the very small sample of these events.
[14] In robustness analysis, we examine firms with nominating committees that exclude CEOs as members.

Next we turn to an analysis of takeover defenses in CVC and TVC backed IPOs. We measure the extent of takeover protection using a version of the index proposed by Bebchuk, Cohen, and Ferrell (2005). They focus on six governance provisions which they argue are legally the most important: staggered boards, limits to shareholder bylaw amendments, supermajority requirements for mergers, supermajority requirements for charter amendments, poison pills, and golden parachutes. We make two changes to their index –golden parachutes, which are not frequently encountered in IPO firms, are replaced by severance agreements, which are payments to senior management in the event of job loss and poison pills, which are infrequent in IPO firms, are replaced by blank check preferred stock, which is the usual class of stock used to create poison pills. Since the poison pill can be put in place after a hostile bid occurs, having a poison pill in place prior to the bid is actually unnecessary. If H3 holds, then we expect to observe that strategic CVC-backed IPOs have higher ATP index levels, since CVCs have strong incentives to protect their companies from being acquired by potential competitors, unlike TVCs, who would realize substantial financial gains from such acquisitions.

Tables 6A and 6B report the results of a univariate comparison of ATP index levels as well as their components across types of CVC-backed IPOs and their matching firms. In Table 6A we find that there is no significant difference between the ATP levels in strategic CVC-backed IPOs and their matching firms. On the other hand, Table 6B shows that IPO firms backed by financial CVCs have ATP index levels significantly lower than their TVC-backed control firms. This result is consistent with the predictions of H4. We conclude that strategic CVC-backed IPOs employ more takeover defenses, which could ward off bids by competitors of the CVC parent. At the same time, higher APTs can lead to greater management entrenchment, unless this effect is offset by other corporate governance differences such as more independent boards. Then, strategic CVCs could find higher ATP index levels to be beneficial. In further analysis, we examine the frequency of acquisitions in the following 3 years and find that CVC parents and their competitors are equally likely to acquire these IPO firms.

We further examine the differences in these takeover defenses in Tables 6A and 6B, where we compare each component of the ATP index. Since staggered boards are considered the strongest common takeover defense, we focus on this particular ATP. We find that strategic CVC-backed IPOs employ staggered boards more often than their control firms or financial CVC-backed IPO firms. Staggered boards are present in 63.3% of the strategic CVC backed IPOs, while they occur in only 51.1% of the matched firms (the difference is significant at the 10% level) and in 45.2% of the IPOs backed by financial CVCs. There is no difference between CVC backed IPOs and their control firms with respect to the other elements of the ATP index. This evidence supports the above-mentioned argument that CVCs have greater incentive to

employ more anti-takeover mechanisms. On the other hand, staggered boards allow managers to entrench themselves and thus, might be shareholder value destroying (see Bebchuk and Cohen (2005) and Faleye (2006)), which might negatively affect the value of a CVC's strategic investments. However, strategic CVCs also address the negative effects of managerial entrenchment by encouraging its IPO firms to appoint more independent boards and key committees, which could more than offset the entrenchment effects of senior management.

To further analyze these questions, we use a regression framework to control for other IPO characteristics, which could differ across the two samples. We then examine the determinants of the decision to adopt a staggered board, which is a particularly effective ATP.[15] We use a probit model to examine this question where the dependent variable is equal to 1 if the firm has a staggered board at the time of the IPO, and is 0 otherwise. We use a model specification similar to Pompilio (2007), who investigates the general impact of VC backing on the decision to adopt a staggered board.

The results are presented in Table 7. We can see that the presence of strategic CVC investor is associated with a higher probability of adopting a staggered board. In Model 1, the coefficient on the *Strategic* indicator variable is 0.367, which is significant at the 5% level (z-stat=2.15). In terms of economic significance, the results suggest that the presence of a strategic CVC investor increases the likelihood of a staggered board by roughly 11%. In Model 2 we include an indicator variable equal to one if the strategic CVC is also the lead investor in the firm. The coefficient on this variable, however, is not significantly different from zero.

In Model 3 we control for the fact that the decision to adopt a staggered board might be endogenous with respect to strategic CVC backing. CVC might invest for strategic reasons in startups which already have a staggered board. To deal with this selection issue, we use a bivariate probit model, where we first model the strategic CVC investment decision and then estimate the model with staggered board as a dependent variable. We use the same specification for the strategic CVC selection model as the one in Section IV.A. The results from the bivariate model specification are qualitatively similar to those in Models 1 and 2. The coefficient on the *Strategic* is positive (0.642) and statistically significant (z-stat=2.74). Thus, using both univariate and multivariate analysis, we document that strategic CVC investors are associated with a significantly higher likelihood of adopting a staggered board. This is consistent with our H3: CVCs making strategic investments also try to protect their parents' strategic interests by reducing the probability that these startups are later acquired by potential competitors. Our findings also complement the results in Pompilio (2007) by showing that a specific type of VC

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[15] Recent studies (see, for example, Bebchuk and Cohen (2005) and Faleye (2007)) present evidence that staggered boards have a significantly negative effect on firm value.

investors (CVCs), which has different investment incentives and objectives, which have an important bearing on whether a startup adopts a staggered board.

IV.D. CEO Turnover

In this section we examine the effect of strategic CVC investments on CEO turnover. We are particularly interested in forced CEO turnovers since this is an important measure of managerial entrenchment. This follows because entrenched managers are less susceptible to involuntary departures since they are not exposed to strong board oversight or market pressure. While higher APTs can increase management entrenchment by shutting down the disciplinary power of the market for corporate control, this effect could be offset if strategic CVC-backed IPOs have more independent boards. Independent directors could exert pressure to limit CEO empire-building, shirking and excessive perquisite consumption, while the ATPs primarily act to protect the strategic alliance from potential competitors.

To identify CEO turnover, we rely on information taken from proxy statements in the five years following the IPO. In our panel data, we have 1,093 firm-years and 273 firms and we observe 170 CEO departures. We then identify forced departures by reading news reports in Factiva around the time of the CEO change. Forced turnovers are those reported to be due to dismissals or firings by the board, departures following poor performance or firm scandals, cases where CEOs depart for a lower status job (if the CEO is under 60) or fails to take a new executive position within 12 months, and other similar circumstances. In total we have 40 forced departures, which translates into a 23.5% turnover rate. Other studies report similar turnover rates (for example, Huson, Parino, and Starks (2001) report a rate of 23.4%, while Faleye (2006) reports a rate of 23%).

To test whether the presence of a strategic CVC investor is associated with higher forced turnover, we estimate this panel data using a logistic model with industry fixed effects and standard errors robust to heteroscedasticity and firm clustering. The dependent variable is an indicator variable that equals one if the CEO departure is forced and zero otherwise. The main explanatory variable of interest is an indicator variable, *Strategic*. Since prior studies identify several factors that influence CEO turnover, we include these as control variables. The first control variable captures past stock return performance in the calendar year preceding the IPO (see Coughlan and Schmidt (1985) and Warner, Watts, and Wruck (1988)). Yermack (1996) finds a negative relation between board size and forced turnover, while Goyal and Park (2002) documents a similar relation between the probability of forced turnover and a dual CEO-chairman of the board. To take these effects into account, we include board size and an indicator for a dual CEO-chairman as regressors. Denis, Denis, and Sarin (1997) show that a CEO is more likely to

continue in the position as his or her shareholdings in the firm rise, while Weisbach (1988) finds that forced CEO turnover is more likely if the board is dominated by independent directors. Thus, we also use CEO ownership and an indicator for boards having a majority outside directors as regressors. All the control variables are measured in the year prior to the CEO's departure.

The results of this estimation are presented in Table 8. In the first model, we include a strategic CVC indicator to investigate whether there is a general impact of strategic CVC investments on forced turnovers. We find that the presence of a strategic CVC is associated with a significantly higher likelihood of forced CEO departure. The *Strategic* indicator has a positive coefficient of 0.792 and a significant t-statistic of 2.23. The result is also economically significant. The odds ratio for the strategic CVC indicator is 2.04, which means that strategic CVC backing increases the odds of forced turnover by more than a 100%. Alternatively, the result suggests that strategic CVC backing increase the probability of forced CEO turnover by 34%. This result supports H3.

We next examine the impact of a lead strategic CVC investor on forced CVC turnover (Model 2). CVCs should be able to put stronger pressure on CEOs if they are the leading VC syndicate investor, since they generally have greater board power. To test the validity of this prediction, we interact the CVC *Strategic* indicator with an indicator for them also being a lead investor. The results support a positive relation between the presence of strategic CVC investors and forced CEO departures since the coefficient on the strategic CVC indicator is positive (0.947) and significant (t-stat=2.55). The odds ratio for this coefficient is 2.32, which implies that strategic CVC investments increase the odds in favor of forced CEO turnover by 132%. Consistent with our other finding for lead strategic CVCs, the probability of forced CEO removal is not significantly related to the interaction term *Strategic Lead*. This may reflect the greater influence of the CEO in these firms due to the greater concern about lead CVC investors having conflicts of interest as shown in Masulis and Nahata (2007). Thus, having a CVC investor results in a higher probability of forced CEO departure, but only when there is strategic fit between the IPO firm and the CVC parent.[16] This supports our initial conjecture that strategic CVC investors have greater incentives and ability to curb managerial entrenchment in order to protect their investments. Turning to the other control variables, we find that past firm performance is negatively correlated with the likelihood of forced CEO departure, which is consistent with findings in previous studies.

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[16] Since boards seem to be more sensitive to ROA performance relative to stock performance according to Graham and Harvey (2001) survey, we test for the sensitivity of CEO forced turnover to ROA performance with the addition of an interaction term. We find similar results to when we examine the past stock return performance, namely that the coefficient associated with ROA is significant and negative, and the interaction term with the *Strategic* indicator is insignificant.

In the third column of the table (Model 3), we examine the impact of strategic CVC investments on the performance-sensitivity of CEO turnover by creating an interaction term between past stock return performance and the strategic CVC indicator variable. The coefficient on *Strategic x Past return* is negative, but insignificant (t-statistic = -0.13). The result suggests that strategic CVC investors do not increase the sensitivity of CEO turnover to performance.

Lastly, we examine the impact of strategic CVC investments on the probability of CEO turnover for a sample that includes only firm years with CEO turnover (Model 4). Here, the indicator variable equals one if CEO departure is forced, and zero if it is voluntary. The coefficient on *Strategic* is again positive (1.319) and statistically significant (t-stat=2.80). For the control variables, we find a significant negative relation between the likelihood of forced CEO turnover and a dual CEO-chairman (t-stat=-1.76), which is consistent with more powerful CEOs being less likely to be fired. In addition, higher levels of founder ownership are associated with a higher likelihood of CEO turnover.

V. Strategic corporate venture capital investments versus strategic relationships

One potential explanation for the results in the previous section is that they are due to other established strategic relationships. VC-backed IPOs sometimes enter into various types of strategic relationships with established corporations and these relationships may also create incentive to establish corporate governance structures similar to those frequently found in the presence of strategic CVC investments. To investigate this possibility, we include VC-backed IPOs with strategic relationships in our analysis. For the period 1992-1999, there are 133 VC-backed IPOs which enter in strategic relationships or strategic alliances with established corporations. We add these IPO firms to the sub-sample of 94 strategic CVC-backed IPOs to form a new sample of 227 IPO firms with strategic relationships. We then compare the board composition, independence of audit and compensation committees, and the use of staggered board provisions between strategic CVC-backed IPOs and VC-backed IPOs with other strategic corporate relationships.

Table 9 presents results for board independence. Again, the primary variable of interest is the indicator variable denoting strategic CVC backing. We find that even after controlling for the presence of corporate alliances, strategic CVC-backed IPOs continue to have more independent boards. In the resulting pooled time series cross-sectional regressions with adjustments for heteroscedasticity and firm clustering, the strategic CVC indicator is positive (0.03) and significant at conventional levels for all the model specifications (t-stat=1.81). The same result holds for year and firm fixed effects (Model 2) and random effects models (Model 3). The coefficient on the strategic CVC indicator is highest in the fixed effects model (0.196 with t-

stat=13.65), which suggests that every strategic CVC IPO has one more independent director than IPOs with business alliances. Some of the other control variables are also significant in various specifications. Additionally, we estimate probit models for the independence of the audit and compensation committees (similar to the analysis in section IV.B.) and perform a univariate analysis of staggered boards. We do not find any significant differences in the composition of the audit or compensation committees or in the use of staggered boards.

Lastly, we investigate whether CEO forced turnover is more likely for strategic CVC-backed IPOs than IPOs with only other strategic relationships. As in Section IV.C., we examine the frequency of forced CEO departures for the sample of IPOs with strategic relationships using *Factiva* and other news sources. We identify 61 CEO turnovers, 14 of which we identify as forced. Combining the two sub-samples yields 35 forced departures in a total of 925 firm-year observations. We use again use a cross-sectional time series logistic model with corrections for heteroscedasticity and firm clustering. The dependent variable is one if the CEO is forced to depart and zero otherwise. We use the same control variables as in Section IV.C.

The results of the estimation are presented in Table 10. Model 1 includes an indicator for strategic CVC investments. Its coefficient is positive (0.663) and significant at conventional levels (t-stat=1.77), which implies that CEOs of strategic CVC IPOs are more likely to be forced out. In Model 2 we include an indicator variable for when a CVC is the lead VC syndicate member. The coefficient on this indicator is not statistically significant, but the coefficient on *Strategic* is 0.74 and significant at the 6% level. The odds ratio for this variable is 2.09, which suggests that having a strategic CVC investor increases the likelihood of CEO forced departure by almost 110% compared to the presence of other strategic relationships. Lastly, in Model 3 we examine whether the presence of a strategic CVC investor increases the turnover-performance sensitivity by including an interaction term between *Strategic* and the firm's market adjusted return. This interaction term is positive (0.315) and significant (t-stat=1.76), consistent with firms backed by strategic CVC investors experiencing greater CEO turnover-performance sensitivities. In addition, the coefficient on *Strategic* is positive (0.951) and significant (t-stat=2.41), which is further support for the disciplining effect of strategic CVCs, even when the market for corporate control is restricted by strong ATPs.

Overall, our results in this section support hypothesis H5. They suggest that strategic CVC investors tend to be associated with more independent boards and a higher likelihood of forced CEO departures. As mentioned in Section II, one plausible explanation for these results is that CVCs have greater incentives and ability to influence the corporate governance structures in the startup firms they invest in. Table 11A presents summary statistics for VC backed IPOs with general strategic alliances. We find that these startup firms are very similar to IPO firms backed

by strategic CVCs; specifically they have similar board sizes, CEO ownership and tenure, incidences of CEO-Chairman duality and percentages of TVC directors. Interestingly, both groups of firms tend to have significantly higher incidences of staggered boards than other VC backed IPO issuers, which is consistent with both groups of strategic alliance partners supporting takeover protections. In addition, as Table 11B indicates that both types of IPOs have similar survival, acquisition, and delisting rates. However, there are two crucial differences between the two groups of startups. First, the mean ownership stake of strategic CVCs in the year of IPO is 16.4%, compared to 2.2% for non-VC strategic alliance partners (the median for these is 0).[17] Second, strategic CVCs hold significantly more board seats than other strategic alliance partners, both pre- and post-IPO. For example, the average number of board members before the IPO is 0.9 for the strategic CVCs and 0.2 for other corporate alliance partners. In the year after the offering, these numbers are 0.8 and 0.1, respectively.[18] In percentage terms, the average board seats for strategic CVCs before the IPO and in the first year after the IPO are 12.5% and 11.9%, respectively. For non-VC alliance partners, these percentages are 2.2% and 2%, respectively, with both differences being statistically significant. Thus, strategic CVCs have more at stake and have better access to startup information compared to other strategic alliance partners. Thus, CVCs are likely to work harder to protect their investments, while having greater influence over the corporate governance of their startup investments. A second implication is that VC-backed IPO firms with outside strategic alliances give managers much greater board power, while supporting important takeover protections. This can have the effect of creating much greater CEO entrenchment in these firms and could lead to greater CEO extraction of private benefits of control and lower shareholder wealth creation.

VI. Strategic CVC backing and post-IPO operating performance

Hypothesis 6 asserts that strategic CVCs would make valuable contributions to the development of their portfolio firms and would be less likely to Grandstand. To test this hypothesis, we examine IPO firms' expected growth rates measured by the ratios of (1) R&D expenditures to capital expenditures and (2) R&D expenditures plus capital expenditure to total assets ratio, measured over the three year period following the IPO. Table 12 reports regression estimates when each of the two growth measures is regressed against *Strategic CVC*, other control variables used in prior analysis, and industry and year fixed effects. We also examine the profitability of strategic CVC backed and other VC backed IPOs using industry-adjusted ROA.

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[17] In an alternative test, we use only TVC-backed IPOs whose strategic partners have ownership stakes greater than zero and find qualitatively similar results.
[18] In unreported tests of both means and medians we find statistically significant differences.

The evidence in Panel A suggests that strategic CVC backed IPOs have higher expected post-IPO growth rates than other IPOs. The coefficient on *Strategic CVC* is positive and significant at the 5% level for both measures of expected growth rates. However, we do not find any significant differences between the long-run operating performance measures of IPOs backed by strategic CVCs and other VCs. H6 also predicts that strategic CVC backed IPOs are less likely to be delisted because of financial distress and less likely to be acquired. Panel B in Table 12 presents the delisting rates of strategic and financial CVC backed IPOs and their matching firms. Strategic CVC backed IPOs are more likely to survive and are less likely to be acquired than their control firms. This finding is consistent with both H6 and the earlier evidence that this type of IPO employs more ATPs. There is no difference between the two types of IPOs in terms of delisting due to financial distress. On the other hand, financial CVC backed IPOs do not differ significantly from their control firms with respect to rates of survival, acquisition, and delisting because of financial distress. Thus, the evidence in Table 12 provides some support for H6.

VII. Conclusion

We investigate how differences in investment incentives and strategies between CVCs and TVCs affect corporate governance structures of IPO firms. We hypothesize that strategic investments by CVCs can lead to certain type of corporate governance structure, which reflect the nature of strategic alliances between CVC parents and startups and the need for CVCs to protect their strategic investments. On the other hand, we do not expect any significant differences between TVC-backed IPOs and IPOs backed by CVCs that invest purely for financial reasons. We test three hypotheses regarding the effects of prior CVC funding of IPO firms which is related to their continued involvement after the IPO, the degree of independence of the board and key board committees, and the level of managerial entrenchment. We test our hypotheses using a sample of 276 IPOs during 1992-1999, supplemented by a large amount of hand collected corporate governance data.

Consistent with the strategic alliance hypotheses, we find that IPO firms backed by strategic CVCs have more independent directors on the board and more independent directors on compensation committees than a set of matched firms or a set of IPO firms backed by purely financially motivated CVCs. In addition, forced CEO turnover is more likely in such IPOs. Both results are statistically and economically significant. We do not find any significant differences between the board composition and forced CEO turnover in IPO firms backed by financial CVCs and a set of matched firms. In addition, we find that strategic CVC-backed IPOs have stronger anti-takeover protections than other IPOs, and that the difference is mainly due to heavy use of staggered boards. We interpret this as reflecting CVC concerns for protecting the strategic

relationships that these IPO firms have with the CVCs' parents. Our explanation is that although ATPs produce greater managerial entrenchment, there is an offsetting benefit for CVCs since they prevent competitors from acquiring CVC-backed IPOs and potentially destroying valuable strategic relationships. In addition, the managerial entrenchment effect of anti-takeover devices is at least partially counteracted by more independent boards and compensation committees. Lastly, we compare IPO firms backed by strategic CVCs to IPO firms with general strategic relationships with other corporations and find that they look similar with respect to the independence of board committees and the use of takeover defense mechanisms. The latter finding is consistent with both types of strategic partners supporting takeover defenses, which can protect the business alliance from disruption by a competitor taking over the newly public firm. However, firms backed by strategic CVCs have much larger shareholdings and firms they back continue to have significantly more independent directors and a higher likelihood of forced CEO turnover, especially in the face of poor firm performance.

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Appendix A
Variable definition

Variable	Definition
Strategic	An indicator that equals one if there is a strategic CVC investment
Strategic CVC lead	An indicator that equals one if there is a strategic CVC investment and the CVC is the lead VC
CEO-chairman	An indicator that equals one if the CEO is also a chairman of the board
CEO ownership	The percentage ownership of the firm's CEO
CEO-founder	An indicator that equals one if the CEO is also a founder of the company
Firm size	The log of sales (Compustat item 12) in the previous year
Firm risk	Measured as the industry median standard deviation of stock returns in the previous year
Cash flow/Sales	(Compustat item 13)/(Compustat item 12)
R&D intensity	Measured as the ratio of R&D (Compustat item 46) to total assets (Compustat item 6) in the previous year
ROA	The match-adjusted return on assets (ROA), computed as net income (data 172) divided by total assets (data 6), as at the end of the 3rd year (12th quarter after the quarter of the offer date) for the IPO firm minus the industry median ROA on the same date, where the industries are based on 4 digit SIC codes if there is a minimum of 5 non-issuing firms, else 3 digit SICs codes, or 2 digit SIC codes until there are at least 5 non-issuing firms. We use the nth quarter measure, where n <12 for firms that do not survive for 3 years post issue.
R&D expenditure/ Capital Expenditure	The ratio of R&D expenditures (Compustat item 46) to capital expenditures (Compustat item 128).
(R&D + Capital Expenditure) / Total Assets	The ratio of research and development expenditures (R&D) plus capital expenditures to total assets as at the end of the third year after the IPO, computed using Compustat annual financial statement database.
Past return performance	The company's market-adjusted returns (using the CRSP equal-weighted portfolio of NYSE/Amex/Nasdaq stocks) in the previous calendar year
Firm stage	If a firm is designated by VentureXpert as 'Early Stage', 'Other Early', 'Seed', or 'Startup' then we classify it as early stage. If a firm is designated by VentureXpert as 'First Stage', 'Second Stage, 'Third Stage', 'Expansion', 'Other Expansion', 'Bridge', 'Bridge Loan', or 'Other Later Stage' then we classify it as late stage.
Prestige	Underwriter rank, calculated using the approach in Carter and Manaster (1990)
Abvrange	An indicator equal to one if the IPO offer price is above the middle of the pre-offer filing range

Competitive industry	The Herfindahl index for the respective 2-digit SIC code
Bank VC	An indicator that equals one if one of the VC investors is a bank VC
VC reputation	The age of the lead VC. A lead VC is defined as the VC with the earliest investment in the firm. If there are two or more VCs at the initial round, we select the VC with the largest investment as the lead VC.
Underwriter rank	The rank of the lead underwriter is calculated using the approach in Carter and Manaster (1990)

Table 1
Summary statistics for our IPO samples

The sample consists of 276 venture backed IPOs for the period 1992-1999. Strategic CVCs are IPOs which have a strategic relationship with their CVC investor. Financial CVCs are IPOs which have no strategic relationship with their CVC investor. Matching sample in each case is a sample of TVC backed IPOs from the same industry (three- and four-digit SIC) and with similar size (based on pre-IPO sales). Age is measured as of the IPO year. R&D intensity is calculated as R&D expenses (Compustat item43) divided by total assets (Compustat item6). Underwriter rank is calculated using the approach in Carter and Manaster (1990). Lead VC age is the age of the lead venture capitalist in the year of the offering. Lead VC is the VC with the earliest investment in the company. The symbols ***, **, * represent statistically significant differences between strategic and financial CVC IPOs and their respective matching firms at the 1%, 5%, and 10% based on nonparametric Mann-Whitney test for equality of medians.

Variables	Strategic CVC IPOs		Financial CVC IPOs	
	CVCs	Matching sample	CVCs	Matching sample
Number of companies	94	94	44	44
Age at IPO	5.3	5.2	7.6*	5.9
	(4.0)	(4.0)	(6.0)	(5.0)
Pre-IPO sales (mill.)	11.2	11.0	18.8	18.9
	(5.3)	(5.2)	(11.0)	(12.3)
Pre-IPO book value of assets	24.8*	20.2	24.5	18.5
	(13.7)	(9.7)	(14.8)	(9.8)
Pre-IPO R&D Intensity (%)	41.4	36.6	29.4	32.9
	(27.8)	(25.5)	(16.6)	(21.2)
IPO proceeds (mill.)	54.6***	39.4	51.6**	34.9
	(43.0)	(33.9)	(39.1)	(32.0)
Underwriter rank	8.1**	7.6	8.2	7.6
	(9.0)	(8.0)	(8.0)	(8.0)
Lead VC age	14.1	15.6	13.3	13.5
	(13.5)	(16)	(11.5)	(12)
Main industries – SIC codes	73, 28, 36, 38, 48		73, 36, 35, 38, 28	
Major CVC investors (number of IPOs in our sample)	Microsoft(8) Intel(7) Cisco Syst.(5) AOL(4) MediaOne(4)		GE(9) Intel(6) AT&T(5) Xerox(4) EG&G(3)	
Strategic relationships				
Joint product development	37			
CVC is supplier	15			
CVC is customer	28			
Marketing/Distribution	36			

Table 2
Summary statistics for strategic and financial CVC backed IPOs

The table presents summary statistics for the sample of 94 strategic and 44 financial CVC backed IPOs for the period 1992-1999. Strategic CVC IPOs are IPOs which have a strategic relationship with their CVC investor. Financial CVC backed IPOs are cases where the IPO issuer has no strategic relationship with the CVC parent. Both strategic and financial CVC backed IPOs have TVC investors as well. Matching TVC IPOs in each case is a sample of TVC backed IPOs from the same industry (three- and four-digit SIC) and with similar size (based on pre-IPO sales). Gray directors are outside directors that have some commercial or financial relationship to the firm. Year 0 is the IPO year. The symbols ***, **, * represent statistically significant differences between strategic CVC IPOs and their matching firms at the 1%, 5%, and 10% based on nonparametric Mann-Whitney test for equality of medians.

Panel A. Strategic CVC backed IPOs

Variables – mean (median)	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Ownership							
CVCs	20.7%	16.4%	13.2%	9.7%	7.4%	5.3%	2.6%
	(17.5)	(12.7)	(11.2)	(6.9)	(4.9)	(0.0)	(0.0)
IPOs with CVC shares (%)	100%	100%	87.1%	69.5%	52.1%	43.1%	29.5%
Matching TVC IPOs	42.2%	30.9%	24.5%	15.2%	9.7%	8.1%	5.5%
	(42.2)	(32.0)	(23.1)	(11.4)	(3.9)	(0.0)	(0.0)
Number of venture directors							
CVC directors		0.9	0.8	0.6	0.5	0.3	0.2
		(1.0)	(1.0)	(0.0)	(0.0)	(0.0)	(0.0)
IPOs with CVC directors (%)		66%	63.4%	48.8%	36.6%	24.6%	19.7%
TVC directors –coinvesting		1.9	1.7	1.5	1.1	0.9	0.8
TVCs		(2.0)	(2.0)	(1.0)	(1.0)	(1.0)	(1.0)
TVC directors – matching		2.1	1.8	1.4	1.2	0.9	0.6
TVC IPOs		(2.0)	(2.0)	(1.0)	(1.0)	(1.0)	(0.0)
CEO ownership							
Strategic CVC IPOs	9.5%	7.7%	6.4%	5.9%	5.1%	5.4%	4.6%
	(6.1)	(4.6)	(3.8)	(3.8)	(3.6)	(3.6)	(3.2)
Matching TVC IPOs	11.2%	8.3%	7.7%	6.5%	5.4%	6.1%	5.7%
	(6.1)	(4.3)	(4.3)	(3.6)	(3.0)	(3.4)	(3.1)
Strategic CVC vs. CEO –	6.30	6.66	4.53	1.51	0.45	-1.77	-3.64
z-stat (p-value)	(0.00)	(0.00)	(0.00)	(0.13)	(0.65)	(0.08)	(0.00)
CEO/Chairman indicator							
Strategic CVC IPOs		0.5	0.5	0.5	0.4	0.5	0.4
		(0.0)	(1.0)	(0.5)	(0.0)	(0.0)	(0.0)
Matching TVC IPOs		0.4	0.5	0.5	0.4	0.4	0.5
		(0.0)	(1.0)	(1.0)	(0.0)	(0.0)	(0.0)
Independent directors (%)							
Strategic CVC IPOs		72.0%*	71.7%*	74.4%***	71.7%	72.2%**	75.1%**
		(73.2)	(72.4)	(75.0)	(71.4)	(75.0)	(77.8)
Matching TVC IPOs		69.2%	69.2%	67.2%	71.7%	63.8%	68.6%
		(71.4)	(71.4)	(71.4)	(71.4)	(66.7)	(71.4)

	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Gray directors (%)							
Strategic CVC IPOs		1.0%	0.9%	0.9%	1.8%	1.9%	1.4%
		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Matching TVC IPOs		0.8%	1.2%	2.0%	1.5%	1.8%	3.5%
		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Inside directors (%)							
Strategic CVC IPOs		28.0%*	27.6%	24.4%***	26.6%	26.0%***	23.6%*
		(25.0)	(25.0)	(22.0)	(25.0)	(25.0)	(21.0)
Matching TVC IPOs		29.9%	29.5%	30.8%	26.7%	33.3%	27.9%
		(28.6)	(28.6)	(28.6)	(28.6)	(34.5)	(28.6)

Panel B. Financial CVC backed IPOs

Variables – mean (median)	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Ownership							
Financial CVC IPOs	16.0%	11.2%	8.5%	4.8%	4.3%	4.6%	3.4%
	(11.3)	(7.9)	(6.4)	(0.0)	(0.0)	(0.0)	(0.0)
IPOs with CVC shares (%)	100%	93.2%	72.1%	40.5%	32.2%	28.6%	20%
Matching TVC IPOs	44.7%	29.5%	20.8%	11.1%	5.4%	6.0%	2.0%
	(37.9)	(28.0)	(18.3)	(7.0)	(0.4)	(0.0)	(0.0)
Number of venture directors							
CVC directors		0.5	0.3	0.2	0.3	0.3	0.2
		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
IPOs with CVC directors (%)		40.9%	32.6%	21.6%	25.8%	17.9%	16%
TVC directors – coinvesting TVCs		2.1	1.7	1.2	0.8	0.7	0.7
		(2.0)	(2.0)	(1.0)	(1.0)	(0.5)	(0.5)
TVC directors – matching TVC IPOs		1.9	1.7	1.3	1.0	0.9	0.60
		(2.0)	(1.0)	(1.0)	(1.0)	(1.0)	(0.5)
CEO ownership							
Financial CVC IPOs	9.7%	7.2%	6.7%	5.5%	5.2%	5.8%	3.5%
	(4.8)	(3.7)	(3.6)	(2.9)	(3.0)	(3.1)	(2.9)
Matching TVC IPOs	9.1%	5.7%	5.2%	4.5%	3.9%	3.8%	3.3%
	(5.6)	(3.4)	(3.6)	(3.3)	(2.8)	(2.9)	(2.1)
Financial CVC vs. CEO – z-stat (p-value)	3.32	3.46	1.03	-1.82	-2.62	-2.56	-3.24
	(0.00)	(0.00)	(0.31)	(0.07)	(0.01)	(0.01)	(0.00)
CEO/Chairman indicator							
Strategic CVC IPOs		0.5	0.5	0.4	0.4	0.5	0.5
		(0.5)	(0.0)	(0.0)	(0.0)	(1.0)	(0.0)
Matching TVC IPOs		0.3	0.4	0.5	0.4	0.5	0.5
		(0.0)	(0.0)	(1.0)	(0.0)	(0.0)	(0.5)
Independent directors (%)							
Financial CVC IPOs		70.8%	71.0%	70.0%	71.4%	73.3%	74.9%**
		(71.4)	(71.4)	(71.4)	(72.0)	(75.0)	(80.0)

Matching TVC IPOs	67.6%	67.9%	67.7%	68.9%	66.6%	63.2%
	(71.4)	(71.4)	(71.4)	(71.4)	(66.7)	(66.7)
Gray directors (%)						
Strategic CVC IPOs	1.4%	1.3%	1.6%	1.2%	0.0%	0.5%
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Matching TVC IPOs	0.5%	0.7%	0.4%	0.4%	1.1%	2.9%
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Inside directors (%)						
Financial CVC IPOs	27.8%	27.7%	28.3%	27.4%	26.7%	24.3%**
	(28.6)	(25.0)	(28.6)	(25.0)	(25.0)	(20.0)
Matching TVC IPOs	31.9%	31.4%	31.9%	30.7%	32.3%	33.9%
	(28.6)	(28.6)	(28.6)	(28.6)	(33.3)	(33.3)

Table 3
Primary shares sold at IPO as percentage of total shares outstanding prior to IPO

The table presents the results of a univariate and multivariate analysis of the ratio of primary shares sold at the offering to pre-IPO shares outstanding. The sample includes only observations in the year of IPO. Nonparametric Mann-Whitney test for equality of medians is used in Panel A. Strategic is an indicator that equals one if there is a strategic CVC investor. Leading CVC is the first CVC investor in the firm. CEO tenure is the tenure of the CEO. CEO chairman is an indicator that equals one if the CEO is also a chairman of the board. Total assets is the Compustat item006 in the year prior to IPO. Firm age is the age of the firm at IPO. R&D intensity is measured as the ratio of R&D to sales in the previous year. VC reputation is the age of the lead VC. Underwriter rank is an indicator variable that equals one if the leading underwriter's rank is above 7 based on the Carter-Manaster (1990) reputation measure, updated by Jay Ritter. Abvrange is an indicator equal to one if the IPO offer price is above the middle of the pre-offer filing range. White (1980) heteroskedasticity-consistent t-statistics are reported in brackets.

Panel A. Univariate results

	CVC	Matching	p-value of tests for
	Mean (median)	Mean (median)	differences in medians
Strategic	27.7% (26.1%)	52.1% (37.8%)	0.01
Financial	39.0% (31.6%)	53.2% (38.7%)	0.22
Strat vs. Fin			0.05
Num. Obs.	94	44	

Panel B. Regression analysis

Variables	Dependent variable: Primary shares/Pre-IPO shares		
	(1)	(2)	(3)
Strategic	-0.156	-0.151	-0.167
	[-2.61]	[-2.60]	[-2.61]
Strategic CVC lead		-0.068	-0.022
		[-0.95]	[-0.28]
Log (CEO tenure)	-0.045	-0.043	-0.035
	[-1.48]	[-1.45]	[-1.05]
CEO-chairman	-0.006	-0.011	-0.013
	[-0.09]	[-0.15]	[-0.17]
Log (Total assets)	0.011	0.011	-0.025
	[0.24]	[0.23]	[-0.63]
Log (Firm age)	-0.149	-0.150	-0.141
	[-1.02]	[-1.02]	[-0.81]
R&D intensity	-0.044	-0.047	-0.079
	[-0.53]	[-0.56]	[-0.86]
Log (VC reputation)	-0.019	-0.019	-0.004
	[-0.53]	[-0.55]	[-0.11]
Underwriter rank	-0.188	-0.187	-0.134
	[-2.19]	[-2.17]	[-2.16]
Abvrange	-0.002	-0.001	-0.002
	[-0.04]	[-0.02]	[-0.03]
Industry fixed effects	No	No	Yes
Num. Obs.	273	273	273
p-value of χ^2	0.01	0.01	0.01
Pseudo R^2	0.07	0.07	0.10

Table 4
Board composition and strategic CVC investments

The table presents the results of a pooled cross-sectional time series regression of the fraction of independent directors on the company's board on a number of explanatory variables for the period 1992-1999. Strategic is an indicator that equals one if there is a strategic CVC investor. Leading CVC is the first CVC investor in the firm. CEO-chairman and CEO-founder are respectively indicators that equal one if the CEO is also a chairman of the board and if the CEO is a firm founder. VC reputation is the age of the lead VC. R&D intensity is measured as the ratio of R&D to total assets in the previous year. Firm risk is measured as the industry median standard deviation of stock returns in the previous year. Competitive industry is the Herfindahl index for the respective 2-digit SIC code. Standard errors are robust to heteroscedasticity and firm clustering. The t-statistics are reported in brackets.

Panel A. Whole sample results

Variables	Percentage of independent directors on the board				
	Pooled cross-sectional time series regressions			Random effects GLS	General linear model
	(1)	(2)	(3)	(4)	(5)
Strategic	0.028	0.029	0.048	0.028	0.134
	[2.07]	[2.18]	[2.13]	[1.96]	[2.06]
Strategic CVC lead		-0.005		0.007	
		[-0.24]		[0.32]	
CEO characteristics:					
CEO ownership	-0.0004	-0.0005	0.001	0.003	-0.002
	[-0.36]	[-0.37]	[0.45]	[0.43]	[-0.44]
Log (CEO tenure)	0.0003	0.0005	0.010	0.006	0.003
	[0.03]	[0.05]	[0.81]	[0.97]	[0.06]
CEO-chairman	0.018	0.018	0.009	0.012	0.088
	[1.39]	[1.39]	[0.80]	[1.39]	[1.43]
CEO-founder	0.041	0.041	0.023	0.029	0.189
	[2.48]	[2.49]	[1.02]	[2.48]	[2.35]
Firm characteristics:					
Log (Firm size)	-0.002	-0.002	0.004	-0.001	-0.012
	[-0.47]	[-0.47]	[0.60]	[-0.36]	[-0.47]
Firm risk	-0.071	-0.072	-0.094	-0.075	-0.330
	[-0.66]	[-0.68]	[-0.86]	[-0.92]	[-0.64]
R&D intensity	-0.003	-0.003	0.026	0.011	-0.013
	[-0.14]	[-0.17]	[1.83]	[0.76]	[-0.15]
Cash flow/Sales	-0.00001	-0.00001	-0.00002	-0.00002	-0.0001
	[-3.37]	[-3.37]	[-7.61]	[-1.30]	[-3.74]
Log (Firm age)	0.001	0.001	-0.011	-0.005	0.003
	[0.08]	[0.08]	[-0.34]	[-0.36]	[0.04]
Founder ownership	-0.362	-0.361	-0.214	-0.276	-1.629
	[-5.26]	[-5.25]	[-2.25]	[-5.61]	[-5.25]
Log (VC reputation)	0.008	0.009	0.031	0.006	0.039
	[1.06]	[1.07]	[4.85]	[0.61]	[1.03]
Competitive industry	-0.131	-0.139	0.511	0.283	-0.620
	[-0.32]	[-0.33]	[1.26]	[0.96]	[-0.28]
Industry fixed effects	Yes	Yes	No	Yes	Yes
Firm and year fixed effects	No	No	Yes	No	No
Intercept	0.753	0.752		0.745	1.134
	[19.77]	[19.74]		[7.27]	[6.07]
Num. Obs.	1201	1201	1201	1201	1201
Adjusted R^2	0.12	0.12	0.66	0.14	

Table 4 (continued)

Panel B. Endogeneity of strategic CVC backing and CEO/COB
Early-stage IPOs are firms that received their first VC investment when they were at "Seed", "Startup", or "Early stage" of development. Model 1 includes all financial CVC backed and TVC backed IPOs in our sample and only those strategic CVC backed IPOs that were at early stage when the CVC invested for first time. Model 2 includes only those IPOs (strategic CVC backed, financial CVC backed and TVC backed) that were at early stage when CVCs (for the CVC backed firms) or TVCs (for the matching firms) invested for first time. Model 3 controls for the potential endogeneity of strategic CVC backing using an IV approach, where we instrument for strategic CVC investments using the aggregate CVC investments as a portion of total VC investments in the year prior to a startup's initial VC investment, the stage at which an IPO receives its first VC investment (early or late), and the average number of companies that the VCs investing in the startup have taken public. Model 4 controls for the endogeneity of the CEO-chairman variable using CEO-founder as an instrument. Standard errors are robust to heteroscedasticity and firm clustering. The t-statistics are reported in brackets.

Variables	Percentage of independent directors on the board			
	Early-stage strategic CVCs	All early-stage IPOs	Endogeneity of strategic CVC	Endogeneity of CEO/COB
	(1)	(2)	(3)	(4)
Strategic	0.043	0.044	0.209	0.031
	[2.20]	[1.94]	[1.86]	[2.33]
Strategic CVC lead	-0.013	-0.025	-0.080	-0.001
	[-0.45]	[-0.82]	[-1.46]	[-0.08]
CEO characteristics:				
CEO ownership	0.002	0.001	-0.001	-0.0005
	[1.57]	[0.40]	[-0.93]	[-0.38]
Log (CEO tenure)	-0.002	0.014	0.004	0.011
	[-0.14]	[1.14]	[0.28]	[1.22]
CEO-chairman	-0.001	-0.003	0.018	0.024
	[-0.05]	[-0.17]	[1.19]	[1.84]
CEO-founder	0.038	0.015	0.026	
	[1.70]	[0.65]	[1.10]	
Firm characteristics:				
Log (Firm size)	0.001	0.021	-0.005	-0.002
	[0.14]	[2.14]	[-0.79]	[-0.40]
Firm risk	-0.144	-0.183	-0.458	-0.072
	[-1.01]	[-0.97]	[-1.64]	[-0.67]
R&D intensity	-0.010	0.009	-0.020	-0.004
	[-0.45]	[0.27]	[-0.85]	[-0.23]
Cash flow/Sales	-0.00002	-0.001	-0.00002	-0.00001
	[-3.56]	[-1.79]	[-2.87]	[-4.26]
Log (Firm age)	-0.025	-0.039	0.017	-0.006
	[-1.17]	[-1.62]	[0.78]	[-0.41]
Founder ownership	-0.421	-0.599	-0.261	-0.299
	[-5.19]	[-5.25]	[-2.26]	[-4.29]
Log (VC reputation)	0.007	-0.008	0.00002	0.008
	[0.57]	[-0.54]	[0.02]	[1.02]
Competitive industry	-0.194	-0.175	-0.116	-0.058
	[-0.29]	[-0.16]	[-0.55]	[-0.14]
Industry fixed effects	Yes	Yes	Yes	Yes
Intercept	0.811	0.831	0.559	0.743
	[14.32]	[10.98]	[3.76]	[19.49]
Hansen-Sargan J-statistic			0.48	

p-value for J-statistic			0.78	
Num. Obs.	894	471	1201	1201
Adjusted R^2	0.16	0.21	0.15	0.14

Table 4 (continued)

Variables	Percentage of independent directors on the board			Percentage of insiders on the board
	Only firm-years prior to CVC exit	Median regression	Other fin. institutions	
	(1)	(2)	(3)	(4)
Strategic	0.027	0.031	0.029	-0.029
	[1.81]	[3.70]	[2.18]	[-2.07]
Strategic CVC lead	-0.002	-0.017	-0.014	-0.003
	[-0.10]	[-1.46]	[-0.72]	[-0.13]
CEO characteristics:				
CEO ownership	0.0003	-0.0002	-0.0005	-0.0001
	[0.34]	[-0.40]	[-0.41]	[-0.12]
Log (CEO tenure)	-0.002	0.006	0.004	0.004
	[-0.15]	[0.90]	[0.40]	[0.37]
CEO-chairman	0.008	0.020	0.017	-0.185
	[0.59]	[2.36]	[1.39]	[-13.36]
CEO-founder	0.040	0.044	0.038	-0.049
	[2.09]	[4.44]	[2.34]	[-2.70]
Firm characteristics:				
Log (Firm size)	-0.001	-0.004	-0.007	0.001
	[-0.23]	[-1.33]	[-1.34]	[0.20]
Firm risk	0.001	-0.056	-0.047	0.138
	[0.01]	[-0.59]	[-0.45]	[0.85]
R&D intensity	0.002	0.015	-0.003	-0.018
	[0.12]	[0.97]	[-0.15]	[-0.65]
Cash flow/Sales	-0.00001	-0.00001	-0.00001	0.00001
	[-3.18]	[-3.00]	[-3.32]	[2.17]
Log (Firm age)	-0.006	0.001	0.005	-0.013
	[-0.35]	[0.06]	[0.35]	[-0.85]
Founder ownership	-0.371	-0.401	-0.352	0.374
	[-5.43]	[-9.30]	[-5.07]	[5.31]
Log (VC reputation)	0.011	0.008	0.006	-0.006
	[1.12]	[1.54]	[0.72]	[-0.70]
Competitive industry	-0.004	0.051	-0.169	-0.077
	[-0.01]	[0.16]	[-0.44]	[-0.15]
Underwriter rank			0.049	
			[2.81]	
Bank VC			0.022	
			[1.67]	
Industry fixed effects	Yes	Yes	Yes	Yes
Intercept	0.752	0.693	0.708	0.295
	[15.84]	[13.09]	[16.73]	[7.35]
Num. Obs.	971	1201	1201	1201
Adjusted R^2	0.14	0.13	0.18	0.42

Table 5
Audit and compensation committee composition

The table presents the results of a Probit analysis of the probability of particular compensation, audit and nominating committee composition structure at the IPO. In the Compensation committee specification the dependent variable is an indicator that equals one if the compensation committee has only outside members, and zero otherwise. In the Audit committee specification the dependent variable is an indicator that equals one if the audit committee has only outside members, and zero otherwise. In the Nominating committee specification the dependent variable is an indicator that equals one if the firm has a nominating committee, and zero otherwise. Strategic is an indicator that equals a one if there is a strategic CVC investment. Size is measured by firm sales in the calendar year prior to IPO. VC reputation is the age of the lead VC. CEO-chairman is an indicator that equals one if the CEO is also a chairman of the board. CEO-founder is an indicator that equals one if the CEO is also a founder of the company. Delaware incorporated is an indicator variable that equals one if the company is incorporated in Delaware. We use White (1980) heteroskedasticity-consistent robust standard errors adjusted for firm clustering.

	Compensation committee		Audit committee		Nominating committee	
	Coeff.	Z-Stat	Coeff.	Z-Stat	Coeff.	Z-Stat
Intercept	-5.88	-2.04	0.78	0.30	4.31	2.31
Strategic	0.44	2.07	0.05	0.24	0.41	1.34
Log (Size)	0.07	0.84	0.09	1.13	0.03	0.25
Log (VC reputation)	-0.01	-0.08	-0.08	-0.57	-0.06	-0.29
Log (CEO age)	1.26	2.03	-0.08	-0.12	-1.86	-3.29
Log (CEO tenure)	-0.05	-0.33	0.03	0.21	0.26	1.05
CEO-chairman	0.10	0.21	0.11	0.55	-0.41	-1.14
CEO-founder	0.02	0.24	0.38	1.59		
Delaware incorporated	-0.14	-0.60	0.01	0.03	0.05	0.13
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Num. obs.	276		276		276	
p-value of χ^2	0.01		0.59		0.00	
Pseudo R^2	0.13		0.08		0.12	
Number of firms with independent committees:						
Strategic CVC	87		85			
Financial CVC	40		41			
TVC	94		112			

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Table 6
CVC investment types and antitakeover provisions in the IPO year

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The table presents summary statistics for a version of the Entrenchment Index of Bebchuk, Cohen, and Ferrell (2005) for a sample of 94 strategic and 44 financial CVC backed IPOs for the period 1992-1999. Strategic CVC IPOs are IPOs which have a strategic relationship with their CVC investor. IPOs backed by financial CVCs are issuers which have no strategic relationship with their CVC investor. Matching TVC IPOs in each case is a sample of TVC backed IPOs from the same industry (three- and four-digit SIC) and with similar size (based on pre-IPO sales). The maximum value of the index (indicating high degree of entrenchment) is 6. The symbols ***, **, * represent statistically significant differences between CVC IPOs and their matching firms at the 1%, 5%, and 10% based on nonparametric Mann-Whitney test for equality of medians.

Panel A. Strategic CVC backed IPOs

	Entrenchment Index	Staggered board	Blank check preferred	Limits to amend Charter	Limits to amend Bylaw	Supermajority	Severance agreements
Strategic CVC IPOs	0 – 1%	63.3%	96.9%	42.9%	39.8%	31.6%	30.9%
	1 – 17.5%						
	2 – 13.4%						
	3 – 29.9%						
	4 – 21.6%						
	5 – 12.4%						
	6 – 4.2%						
Mean (median)	3.1 (3)						
Matching TVC IPOs	0 – 2.5%	51.1%	96.5%	37.2%	31.9%	36.2%	31.2%
	1 – 13.8%						
	2 – 28.7%						
	3 – 10%						
	4 – 25%						
	5 – 16.2%						
	6 – 3.8%						
Mean (median)	3 (3)						
p-value of test for difference in medians	0.95	0.09*	0.88	0.43	0.26	0.51	0.46

Table 6 (continued)

Panel B. Financial CVC backed IPOs

	Entrenchment Index	Staggered board	Blank check preferred	Limits to amend Charter	Limits to amend Bylaw	Supermajority	Severance agreements
Financial CVC IPOs	1 – 26.8%	45.2%	97.6%	38.1%	33.3%	26.2%	30.9%
	2 – 31.7%						
	3 – 9.8%						
	4 – 14.6%						
	5 – 14.6						
	6 – 2.5%						
Mean (median)	2.6 (2)						
Matching TVC IPOs	1 – 10%	59.5%	100%	33.3%	28.6%	42.9%	23.3%
	2 – 20%						
	3 – 23.3%						
	4 – 20%						
	5 – 20%						
	6 – 6.7%						
Mean (median)	3.4 (3)						
p-value of test for difference in medians	0.04**	0.19	0.38	0.65	0.64	0.11	0.48

Table 7
Staggered boards and strategic CVC investments

The table presents the results of a probit model regression of an indicator variable equal to one if the firm has a staggered board on a number of explanatory variables. The sample includes only observations in the IPO year. Strategic is an indicator that equals one if there is a strategic CVC investment. Leading CVC is the first CVC investor in the firm. CEO-chairman is an indicator that equals one if the CEO is also a chairman of the board. Firm age is the age of the firm at IPO. Total assets is the Compustat item006 in the year prior to IPO. R&D intensity is measured as the ratio of R&D to total assets in the previous year. VC reputation is the age of the lead VC. Delaware incorporated is an indicator variable that equals one if the company is incorporated in Delaware. CVC activity is the aggregate CVC investments as a portion of total VC investments in the year prior to a startup's initial VC investment. Stage is the stage at which an IPO receives its first VC investment (0 if early or 1 if late). Avg. num. of IPOs is the average number of companies that the VCs investing in the startup have taken public. We use White (1980) heteroskedasticity-consistent robust standard errors.

| | Probit model | | | | Bivariate probit model | |
| | (1) | | (2) | | (3) | |
	Coeff.	Z-Stat	Coeff.	Z-Stat	Coeff.	Z-Stat
Intercept	0.462	0.75	0.280	0.42	-0.113	-0.16
Strategic	0.367	2.15	0.350	2.22	0.642	2.74
Strategic CVC lead			-0.329	-1.42	-0.122	-0.38
CEO-chairman	0.184	1.12	0.194	1.17	0.241	1.48
Log (Firm age)	0.106	0.74	0.111	0.77	0.092	0.66
Log (Total assets)	-0.074	-0.78	-0.073	-0.78	0.001	0.01
R&D intensity	-0.464	-1.93	-0.433	-1.86	-0.325	-1.39
Founder ownership	0.010	1.66	0.010	1.74	0.891	1.54
Log (VC reputation)	-0.174	-1.45	-0.178	-1.49	-0.154	-1.26
Delaware incorporated	0.556	2.72	0.572	2.77	0.540	2.56
Competitive industry	-9.016	-1.80	-8.763	-1.71	-6.525	-1.33
Industry fixed effects	Yes		Yes		Yes	
Num. obs.	273		273		273	
p-value of χ^2	0.01		0.01		0.00	
Pseudo R^2/log-likelihood	0.12		0.12		-303.47	
Selection model						
CVC activity					-7.733	-3.29
Avg. num. of IPOs					-0.004	-1.73
Stage					-0.645	-3.13

Table 8
CEO turnover and strategic CVC investments

The table presents the results of a pooled cross-sectional time series logistic models of CEO turnover in the five years after the IPO for the period 1992-1999. The dependent variable is an indicator that equals one if there is a forced CEO turnover and zero otherwise. Strategic is an indicator that equals one if there is a strategic CVC investment. Leading CVC is a CVC that is the first investor in the company. CEO-chairman is an indicator that equals one if the CEO is also a chairman of the board. Outside directors measures the fraction of independent directors on the board. Past return performance is the company's market-adjusted returns in the previous calendar year. Standard errors are corrected for heteroscedasticity and firm clustering. The t-statistics are reported in brackets. The fourth model includes only firm observations experiencing CEO turnover in that year.

Variables	Whole sample			CEO turnover only
	(1)	(2)	(3)	(4)
Strategic	0.792	0.947	0.933	1.319
	[2.23]	[2.55]	[2.50]	[2.80]
Strategic lead		-0.868	-0.869	-2.194
		[-1.46]	[-1.46]	[-1.96]
Strategic x past performance			-0.023	0.396
			[-0.13]	[1.23]
CEO characteristics				
CEO ownership	-2.368	-2.687	-2.688	-0.085
	[-0.57]	[-0.66]	[-0.66]	[-0.03]
Log (CEO tenure)	0.301	0.372	0.372	0.196
	[1.23]	[1.44]	[1.44]	[0.55]
CEO-chairman	-0.647	-0.616	-0.617	-0.788
	[-1.50]	[-1.45]	[-1.45]	[-1.76]
Firm characteristics				
Log (Board size)	0.587	0.629	0.631	0.362
	[0.72]	[0.74]	[0.74]	[0.41]
Past return performance	-0.330	-0.340	-0.328	-0.311
	[-4.24]	[-4.19]	[-2.28]	[-1.53]
Outside directors	-0.133	-0.170	-0.166	1.137
	[-0.11]	[-0.13]	[-0.13]	[0.73]
Founder ownership	3.159	3.498	3.495	4.164
	[1.58]	[1.79]	[1.79]	[1.76]
Competitive industry	2.990	2.590	2.562	8.825
	[0.39]	[0.34]	[0.34]	[1.31]
Intercept	-5.058	-5.182	-5.180	-3.567
	[-2.64]	[-2.58]	[-2.58]	[-1.69]
Num. Obs.	1093	1093	1093	170
p-value of χ^2	0.01	0.01	0.01	0.06
% correctly classified	96.7%	96.7%	96.7%	79.1%
Pseudo R^2	0.06	0.07	0.07	0.11

Table 9
Board composition – strategic CVC investments versus general alliances

The table presents the results of a pooled cross-sectional time series regression of the fraction of independent directors on the company's board on a number of explanatory variables. The sample includes only strategic CVC backed IPOs and TVC backed IPOs that have strategic alliance with established corporations over the period 1992-1999. Strategic is an indicator that equals one if there is a strategic CVC investment. CEO-chairman is an indicator that equals one if the CEO is also a chairman of the board. CEO-founder is an indicator that equals one if the CEO is also a founder of the firm. Firm size is measured as the sales of the firm in the previous year. R&D intensity is measured as the ratio of R&D to total assets in the previous year. Firm risk is measured as the industry median standard deviation of stock returns in the previous year. VC reputation is the age of the lead VC. Standard errors are corrected for heteroscedasticity and firm clustering. The t-statistics are reported in brackets.

Variables	Percentage of independent directors on the board		
	Pooled cross-sectional time series regression		Random effects GLS
	(1)	(2)	(3)
Strategic	0.025	0.211	0.034
	[1.80]	[5.45]	[2.25]
CEO characteristics			
CEO ownership	0.001	0.002	0.001
	[0.44]	[1.60]	[0.39]
Log (CEO tenure)	0.011	0.006	0.010
	[1.07]	[0.57]	[1.31]
CEO-chairman	0.007	0.015	0.013
	[0.45]	[0.89]	[1.38]
CEO-founder	0.019	0.016	0.013
	[1.15]	[0.69]	[1.03]
Firm characteristics			
Log (Firm size)	-0.001	0.003	0.001
	[-0.11]	[0.48]	[0.33]
Firm risk	0.220	-0.112	0.060
	[1.93]	[-0.78]	[0.73]
R&D intensity	0.011	0.011	0.008
	[0.92]	[1.01]	[0.77]
Cash flow/Sales	-0.00001	-0.00002	-0.00002
	[-2.97]	[-5.51]	[-1.36]
Log (Firm age)	0.037	0.008	0.029
	[2.15]	[0.17]	[2.19]
Founder ownership	-0.331	-0.124	-0.215
	[-3.49]	[-1.69]	[-3.92]
Log (VC reputation)	0.022	0.107	0.014
	[1.13]	[3.06]	[0.68]
Industry fixed effects	Yes	No	Yes
Firm and year fixed effects	No	Yes	No
Intercept	0.381		0.383
	[6.23]		[3.68]
Num. Obs.	1,152	1,152	1,152
Adjusted R^2	0.21	0.68	0.19

Table 10
CEO turnover – strategic CVC investments versus general alliances

The table presents estimates from a logistic model of CEO turnover using a pooled cross-sectional time series where the sample includes strategic CVC backed IPOs and TVC backed IPOs with strategic relationships over the period 1992-1999. The dependent variable is an indicator that equals one if there is a forced CEO turnover and zero otherwise. Strategic is an indicator that equals one if there is a strategic CVC investment. CEO-chairman is an indicator that equals one if the CEO is also a chairman of the board. Outside directors is equal to the fraction of independent directors on the board. Leading CVC is a CVC that is the first investor in the company. Past return performance is the company's market-adjusted returns in the pre-IPO calendar year. Standard errors are corrected for heteroscedasticity and firm clustering. The t-statistics are reported in brackets.

Variables	Full sample		
	(1)	(2)	(3)
Strategic	0.594	0.744	0.968
	[1.77]	[1.94]	[2.46]
Strategic CVC lead		-0.718	-0.686
		[-1.12]	[-1.10]
Strategic x past performance			0.330
			[1.85]
CEO characteristics			
CEO ownership	-4.364	-4.726	-4.858
	[-1.04]	[-1.13]	[-1.11]
Log (CEO tenure)	0.327	0.352	0.329
	[1.06]	[1.13]	[1.06]
CEO-chairman	-0.542	-0.508	-0.488
	[-1.22]	[-1.16]	[-1.10]
Firm characteristics			
Log (Board size)	0.266	0.232	0.244
	[0.29]	[0.25]	[0.26]
Past return performance	-0.447	-0.462	-0.678
	[-4.79]	[-5.05]	[-4.08]
Outside directors	-0.269	-0.257	-0.246
	[-0.22]	[-0.20]	[-0.19]
Founder ownership	1.899	2.185	2.331
	[0.95]	[1.12]	[1.19]
Intercept	-4.215	-4.217	-4.369
	[-1.97]	[-1.92]	[-1.98]
Num. Obs.	925	925	925
p-value of χ^2	0.01	0.01	0.01
% correctly classified	96.4%	96.4%	96.4%
Pseudo R^2	0.06	0.06	0.07

Table 11
VC backed IPOs with general strategic alliances – summary statistics

The table presents summary statistics for the sample of 133 VC backed IPOs for the period 1992-1999 which have strategic alliances with other corporations. Gray directors are outside directors that have some commercial or financial relationship to the firm. Year 0 is the IPO year. Panel B reports the delisting frequencies from the IPO year until year 2006. Wilcoxon-Mann-Whitney test for equality of median is used.

Panel A. Summary statistics

Variables – mean (median)	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Ownership							
SA partners	2.8%	2.2%	1.8%	1.4%	1.1%	0.5%	0.2%
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Number of directors							
SA partners		0.17	0.14	0.10	0.09	0.05	0.04
		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
TVC directors		2.1	1.9	1.4	1.2	0.9	0.8
		(2.0)	(2.0)	(1.0)	(1.0)	(1.0)	(1.0)
CEO ownership	12.2%	9.1%	7.5%	6.1%	4.9%	5.0%	4.7%
	(5.9)	(4.4)	(3.6)	(3.3)	(2.5)	(2.6)	(2.7)
CEO/Chairman indicator		0.4	0.5	0.5	0.5	0.5	0.5
		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
% independent directors		68.1%	68.8%	69.7%	70.2%	69.9%	73.7%
		(71.4)	(71.4)	(71.4)	(71.4)	(71.4)	(75.0)
% gray directors		1.4%	1.8%	2.2%	2.4%	2.3%	2.8%
		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
% inside directors		30.4%	29.3%	28.1%	27.6%	27.7%	23.5%
		(28.6)	(28.6)	(27.3)	(28.6)	(25.0)	(25.0)

Panel B. Delisting rates

	Number of IPOs	Still listed	Acquired	Delisted
TVC backed IPOs with strategic alliances	133	35.3%	42.9%	21.8%
Z-stat (IPOs with strategic alliances vs. Strategic CVC backed IPOs)		-0.77	1.01	-0.28

Table 12
Survival characteristics and post-IPO firm operating performance of strategic and financial CVC backed IPOs

This table presents coefficient estimates for regressions of long-term growth and operating performance measures on the strategic CVC indicator variable. In parentheses are the associated *t*-statistics based on heteroskedasticity consistent standard errors adjusted for industry clustering. The sample includes all CVC backed IPOs and their matching firms. The dependent variables Y is either (a) the ratio of research and development expenses to capital expenditures at the end of 3 years after the IPO year, or (b) the ratio of research and development expenses plus capital expenditure to total assets averaged over 3 years after the IPO year, or (c) the industry-adjusted ROA. The Tobit regression specification is

$$Y = \beta_0 + \beta_I + \beta_1 \, Strategic + \beta_2 \, Underwriter \; rank + \beta_3 \, Log(VC \; reputation) + \beta_4 \, Log(Firm \; size) + \beta_5 \, Log(Firm \; age) \; + \; \varepsilon,$$

where β_0 is a vector of year fixed effects, and β_I is the vector of industry indicator variables. For the industry-adjusted ROA measure, we use a regression with fixed effects only. The definitions of other variables are found in Appendix A. Panel B reports the delisting frequencies from the IPO year until year 2006. Wilcoxon-Mann-Whitney test for equality of median is used.

Panel A. Post-IPO growth and operating performance

Dependant Variable:	Strategic	Underwriter rank	Log (VC reputation)	Log (Firm size)	Log (Firm age)	Adjusted/ Pseudo R^2
(R&D + Capital Expenditures) /Total Assets	0.066**	0.079**	0.001	-0.082***	-0.036	1.40%
	(2.48)	(2.32)	(0.89)	(-8.55)	(-1.48)	
R&D Expenses / Capital Expenditures	11.510**	2.143	0.166	-5.356***	0.820	1.50%
	(2.47)	(0.36)	(0.72)	(-3.11)	(0.19)	
ROA	-0.035	-0.151	-0.008	0.192***	0.107	28.18%
	(-0.38)	(-0.95)	(-1.09)	(3.18)	(1.26)	

Panel B. Delisting rates

Delisting rates	Strategic CVC IPOs		Financial CVC IPOs	
	CVCs	Matching sample	CVCs	Matching sample
Number of companies	94	94	44	44
Still listed	40.4%	24.5%	36.4%	36.4%
Z-stat (Strategic vs. Matching)	2.33			
Z-stat (Strategic vs. Financial)	0.45			
Acquired	36.2%	51.0%	45.4%	40.9%
Z-stat (Strategic vs. Matching)	-2.05			
Z-stat (Strategic vs. Financial)	-1.03			
Delisted	23.4%	24.5%	18.2%	22.7%
Z-stat (Strategic vs. Matching)	0.17			
Z-stat (Strategic vs. Financial)	0.68			

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