

Covenants in Venture Capital Contracts

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This paper studies how covenants are included in contracts between venture capitalists (VCs) and entrepreneurs. I show that VCs hold covenanted veto rights even though they are shareholders who have access to other powerful governance solutions. Unlike bank loans and bonds, venture capital (VC) contracts exhibit considerable variation in their contractual designs. I exploit this variation to confirm the argument that covenants are in place to overcome a conflict of interest that arises from debt-like contractual features of a venture capitalist's preferred stock. In particular, I find that contracts with higher fixed payoffs include 1.6 more covenants than do contracts with lower fixed payoffs. Similarly, VC contracts with no VC board majority requirement include 0.6 more covenants than do contracts that require a VC board majority. Covenants are also more common with older companies and when fewer VCs invest in a round. My findings contribute to both the debt covenant literature and the entrepreneurial finance literature.

Key words: financial contracting; venture capital; entrepreneurship

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1. Introduction and Literature Review

A rich body of theoretical work investigates optimal allocations of control rights between entrepreneurs and their financiers (Aghion and Bolton 1992; Bolton and Scharfstein 1990; Dewatripont and Tirole 1994; Hart and Moore 1994, 1998). Yet real-world evidence pertaining to these allocations is scarce. This paper presents new empirical evidence pertaining to the allocation of specific control rights in venture capital (VC) investments. As noted by Hart (2001), this setting offers a good testing ground for contract theory because venture capitalists (VCs) are sophisticated investors who encounter significant agency and information problems when they finance young entrepreneurial firms (Kaplan and Strömberg 2003, Broughman and Fried 2010). Studying the VC setting may also yield important practical implications, because many start-ups become vital promoters of innovation, employment, and economic growth.

I overcome the data limitations that typically bedevil studies of private firms in the United States by collecting information on VC contract terms from mandatory legal filings. My goal is to provide evidence that helps explain why VCs receive control rights in the form of covenants. My unique data also allow me to provide detailed descriptive evidence of the prevalence of covenants in VC contracts and of the precise types of these covenants. I focus exclusively on contracts from first investment rounds because it is difficult to identify the precise allocation of control

rights in follow-up rounds.¹ I show first that almost all VC contracts include covenants, many of which are functionally similar to the negative covenants that are typical of bank loans and bonds. I then show that the strategy of including such covenants reflects a carefully designed contractual solution to a conflict of interest that arises endogenously from other included terms that make the venture capitalist's preferred stock share some features with a standard debt contract.

My analysis is based on the theoretical arguments of Jensen and Meckling (1976), Myers (1977), and Smith and Warner (1979). If a financier is entitled to a fixed payoff, then the entrepreneur/manager she is financing has an incentive to engage in claim dilution, asset substitution, and overinvestment. An optimal contract should prevent these activities by giving the financier residual control rights, or, if this allocation is for some reason not feasible or optimal, specific control rights in the form of covenants. This argument yields the cross-sectional prediction that covenants will be more prevalent when a financier is entitled to a higher fixed payoff (because the conflict of interest with the entrepreneur is then amplified) and has no residual control rights. Testing this prediction for

¹ To illustrate this point, if the contract from a follow-up round does not include a restrictive covenant, it is nevertheless possible that the investing VCs have the right to veto a decision—an earlier-round contract, in which these VCs also invested, could include such a covenant.

bank loans and bonds is difficult, because such financial contracts are too standardized: debt holders are always entitled to fixed payoffs and have no board control or votes.

VC contracts do not exhibit standardization in their designs because they include tailor-made allocations of board seats and important cash flow contingencies such as cumulative dividends, liquidation preference, participation rights, and automatic conversion provisions (Kaplan and Strömberg 2003). This variation allows me to test—and confirm—the prediction that the more debt-like a VC contract is, the more covenants it includes. The underlying assumption behind this test is that covenants included in VC contracts are not merely legal fine print but instead play an economic role in overcoming conflicts of interest with VC investments.

It is arguable at first glance that VCs do not need the protection offered by covenants because they could force entrepreneurs to make preferred decisions simply by threatening to discontinue their financial or value-adding support. Such threats could facilitate governance, but their extra-contractual nature renders a venture capitalist vulnerable to hold-ups and renegotiation problems. To overcome such problems, VCs often receive contractual residual control rights in the form of board seats (Lerner 1995, Baker and Gompers 2003, Kaplan and Strömberg 2003). However, although board representation undoubtedly guarantees VCs a certain degree of influence, VC power on board seats is limited in three ways. First, only about one in five contracts provides VCs with the majority of board seats. Second, if VCs were to make self-serving decisions as board members, they could face costly litigation for breach of fiduciary duty. Third, board representation is a “blunt” governance solution because it provides VCs with influence not only over decisions about which investor control is optimal, but over other decisions as well.

Consistent with the logic that VCs need control rights beyond what they obtain through holding board seats, I show that covenants are frequently included in VC contracts. Across 182 first-round contracts, I identify 12 unique covenant types that are included selectively and show that 92% of all contracts include at least one such covenant. My interviews with VC partners and lawyers reveal that these covenants are negotiated carefully and that their inclusion can exert considerable impact on company decisions.

As for covenant types, VC contracts never include financial covenants that force a company to maintain specific levels of interest coverage, working capital, or net worth. Such covenants, which are common with bank loans and bonds, would not be feasible in the

VC setting because the accounting numbers of start-up companies are too unreliable and volatile. Every covenant that I observe takes the form of a negative covenant (a protective provision) that gives a venture capitalist the right to veto a certain type of decision. I show that many contracts allow VCs to block new issuances of debt and equity. Covenants pertaining to the sale and acquisition of assets are also frequently included, whereas covenants pertaining to capital expenditure and other investments occur less frequently. VCs often have the right to block an entrepreneur from changing a company’s business model. Another set of covenants restricts an entrepreneur’s ability to hire and compensate executives. In summary, covenants in VC contracts address decisions that are likely to involve a conflict of interest between a venture capitalist and an entrepreneur.

The above discussion points to an economic role for covenants in VC contracts. Building on this insight, I test the theoretically motivated prediction that a financial contract will include a greater number of covenants when a financier is entitled to a higher fixed payoff and has no residual control rights. I show that contracts that entitle VCs to higher fixed payoffs (i.e., include a greater number of investor-friendly cash flow contingencies) include 1.6 more covenants than do contracts that entitle VCs to lower fixed payoffs. Similarly, contracts that do not grant VCs a board majority include 0.6 more covenants than do contracts that grant VCs a board majority. Put differently, I show that debt-like VC contracts include more covenants than do contracts with equity-like cash flow and control features. It is important to understand that all the VC investments that I study offer preferred stock, so the identification is based not on differences between type of security but rather on contractual features pertaining to the preferred stock. I validate these results in multivariate regressions and for most individual covenants.

My cross-sectional analysis of covenant determinants also shows that VC contracts include fewer covenants for younger companies. One explanation for this is that less-mature start-ups have too few valuable assets and too low a salvage value to motivate an investor-friendly allocation of control rights. Kaplan and Strömberg (2003) and Bengtsson and Sensoy (2011) observe a similar empirical association between company age and the inclusion of investor-friendly cash flow contingencies. I also find that fewer covenants are included when more VCs invest in a given round. This is not surprising because covenants are harder to enforce when every investor has weaker monitoring incentives and faces higher haggling costs (Rajan and Winton 1995). This finding also adds weight to my conclusion that covenants in VC contracts play an economic role by addressing conflicts of

interest between VCs and entrepreneurs, not conflicts of interest between VCs.

This paper contributes to the literature on debt covenants, which in recent years has received new attention with papers showing that covenants affect firm-level decision making (for a summary, see Roberts and Sufi 2009). I show that VCs are granted covenants even though they are shareholders who are actively involved in and have access to other powerful governance solutions. My study is, to the best of my knowledge, the first to show that covenants are directly related to the debt-likeness of a financial contract.

This paper also adds to the entrepreneurial finance literature. My finding that covenants are an important part of VC control rights complements existing empirical studies of VC contracts (Sahlman 1990; Gompers 1998; Gompers and Lerner 1996; Kaplan and Strömberg 2003, 2004; Cumming 2008; Bengtsson and Sensoy 2011; Bengtsson and Ravid 2010; Broughman and Fried 2010). Much like these studies, my results highlight the inclusion in VC contracts of complex, tailor-made contractual terms, many of which are complementary to each other. My contribution is to provide novel evidence pertaining to covenants in the VC setting. I show that VCs overcome agency problems by acquiring the right to veto decisions that would be particularly harmful to them, and that such veto rights are more commonplace when such agency problems are more pronounced.

In addition, the statistics I present illustrating how often covenants of various types are included in VC contracts can shed new light on the sorts of problems that VCs encounter in their investments. For instance, the high frequency of covenants pertaining to company exit and asset sales lends support to Berglöf's (1994) thesis that VCs need control over exit decisions because entrepreneurs may derive private benefits from certain company outcomes. The low frequency of covenants pertaining to changes to management teams is surprising in light of the argument that CEO replacements face particularly severe conflicts of interest (Hellmann 1998, Hellmann and Puri 2002).

2. Data Description

2.1. Sample Construction

I collected my sample of VC contracts with the help of the private equity data provider VCExperts, through which I accessed legal filings (Certificates of Incorporation) that venture-backed companies are required to file with their states of incorporation.² The contracts studied in this paper represent a subsample of the

1,804 contracts between U.S. venture-backed companies and U.S. VCs analyzed in Bengtsson and Ravid (2010). Although cost considerations prevent this data set from covering all U.S. VC investments, it is a large sample representing key entrepreneur, company, and VC characteristics.

From this larger sample, I identify all contracts that come from first-round VC financings (about one-quarter of all observations). I study first-round contracts because the complex nature of contracts from follow-up financing rounds makes it prohibitively difficult to identify the control rights associated with each covenant. Each financing round issues a new class of preferred stock with a unique list of covenants and other contract terms. It is hard to disentangle VC rights to block particular decisions because such veto rights may require approval on the part of holders of many classes of preferred stock. Because VCs from earlier rounds often invest in follow-up rounds, they can enjoy many mechanisms by which to veto a decision. My focus on first-round financings also has a theoretical motivation. The severity of the agency problem pertaining to an entrepreneur's decisions is likely to decline as VCs in follow-up rounds demand more board seats and shareholder votes in exchange for the new financing. The economic role of covenants is therefore most pronounced for first-round VC investments.

2.2. Sample Selection Issues

I further limit my study to contracts for which Certificates of Incorporation include complete documentation of the allocation of cash flow contingencies, covenants, and board seats. Although the legal documents I study always include information about the number of board seats allocated to preferred and common shareholders, respectively, the total number of board seats is mentioned in only about half of the contracts in the original sample. Contracts for which I do not have this information are excluded from my sample because I cannot infer whether VCs have a board majority, which is a key variable in my analysis. I would emphasize here that this sample restriction is unlikely to bias my results—the mention of a total number of board seats merely reflects a lawyer's choice of information to add to mandatory legal filings.³

My final sample includes contracts from 182 companies. Admittedly, these companies represent only about 5% of all U.S. VC investments during the period under study. Importantly, I do not deliberately screen for observable company or VC characteristics (except for U.S. location) or for any feature of a VC contract.

² I appreciate the help of Joseph Bartlett, Cory Buecker, and Justin Byers in this process.

³ As discussed in §5, my results are unchanged after controlling for a company's state of incorporation.

It is nevertheless possible that the sample is not representative. In an untabulated test I investigate the extent of bias in my sample. In particular, I compare observable characteristics of companies in my sample with those of venture-backed companies that, according to Venture Economics, one of the largest and most complete databases of data pertaining to U.S. VC investments, received first-round financing between 2005 and 2007. I find that my contract sample is representative regarding industry but includes a disproportionate number of companies that are located outside California. This implies an upward bias in my reporting of the number of covenants because the terms of contracts in California companies are less harsh than are those in other U.S. states (Bengtsson and Ravid 2010). The contract sample also includes a disproportionate number of VCs that are organized as private partnerships. My empirical analysis of covenant determinants shows that such VCs use contracts that include more covenants, again leading to an upward bias in the reported statistics regarding the average number of covenants. However, other sampling issues are associated with a downward bias in my reporting of the number of covenants. The contract sample includes a disproportionate number of companies with a greater number of VCs in the round. The number of covenants is lower for such companies. Similarly, the contract sample includes a disproportionate number of younger companies that are associated with fewer covenants.

In summary, the contract sample is not fully representative regarding all company characteristics. This misrepresentation does not, however, produce an unambiguous upward or downward bias in my reporting of the number of covenants. It should be noted that my regression results for covenant determinants are not biased by this misrepresentation because I control for the abovementioned company characteristics.

The sample size of 182 companies is comparable to those used by other notable VC studies, such as Hellmann and Puri (2002), Kaplan and Strömberg (2003), Hsu (2004), Cumming (2008), and Broughman and Fried (2010). Most contracts in my sample stem from financing rounds conducted in 2006 and 2007, and no contracts were drawn up in 2008 or later. Given the scarcity of evidence pertaining to covenants in VC contracts from other periods, it is difficult to know whether the empirical patterns that I observe are unique to my sample period. The “easy credit” period of 2002–2007 involved relatively borrower-friendly, covenant-like packages for bank loans and bonds (Murfin 2010). Assuming that this laxness carried over to the VC setting, my results are likely to understate, or at least not overstate, the real-world importance of covenants in VC contracts.

Table 1 Summary Statistics

	Mean	Std. dev.	Min	Max
<i>Company in California</i>	29.7%			
<i>Company in Massachusetts</i>	14.3%			
<i>High-Tech Industry</i>	45.6%			
<i>Life Science Industry</i>	24.2%			
<i>Company Age (Years)</i>	2.30	2.81	0.00	17.00
<i>Serial Founder</i>	19.2%			
<i>Serial Successful Founder</i>	7.1%			
<i>Total Round Amount (\$ million)</i>	6.82	9.64	0.08	100.00
<i>Post-Money Valuation</i>	20.16	44.57	0.68	320.91
<i>Ownership Stake</i>	0.29	0.09	0.06	0.46
<i>Round Number of VCs</i>	2.68	1.54	1.00	10.00
<i>VC and Company in Same U.S. State</i>	47%			
<i>VC Experience (Portfolio Size)</i>	95.78	130.22	1.00	781.00
<i>VC Private Partnership</i>	86%			
<i>Number of VC Board Seats (Preferred)</i>	2.13	0.92	1.00	8.00
<i>Number of Non-VC Board Seats (Common)</i>	1.71	1.00	0.00	6.00
<i>Number of Joint Board Seats (Com + Pref)</i>	1.38	1.03	0.00	6.00
<i>Number of Total Board Seats</i>	5.23	1.30	3.00	9.00
<i>VC Board Majority With Outsiders</i>	18%			
<i>VC Board Majority</i>	18%			
<i>Cumulative Dividends Present</i>	46%			
<i>Participation (Participating Preferred)</i>	70%			
<i>Auto. conv. IPO Enterprise Value (\$million) if Participation</i>	125.253	90.18	30.00	518.35
<i>Automatic Conversion (above median IPO enterprise value if participation)</i>	36%			

Notes. The sample comprises 182 first-round VC financing contracts from U.S. companies. Variables for which only the mean is reported are dummies. Company, round, and VC characteristics are from Venture Economics, with the exception of *Serial Founder* and *Serial Successful Founder*, which are hand collected using various online databases and web searches. All VC variables reflect the status of the lead VC in the round. *Company Age*, *VC Experience*, and *VC IPO Ratio* reflect the situation at the time of the financing round. Variables related to board seats and cash flow contingencies are collected from mandatory legal filings (Certificate of Incorporation). *VC Board Majority With Outsiders* means that VCs hold a majority of the board seats only if outsiders (who are appointed jointly by VCs and entrepreneurs) vote with the VCs. *VC Board Majority* means that the VCs hold a majority of the board seats regardless of how outsiders vote. *Cumulative Dividends* are disbursements that the investor earns annually but are paid out only when the company is sold or liquidated. Liquidation preference and cumulative dividends are senior to common stock. *Participation* gives investors participating preferred stock, which entitles them to both a liquidation preference (which is a fixed dollar amount that is senior to common stock) and a fraction of common stock when the company is sold or liquidated. *Automatic Conversion Enterprise Value* is the exit (IPO, or in rare cases also merger) enterprise value (\$millions) at which the VC’s fixed payoffs from participation (cumulative dividends and liquidation preference) are annulled due to automatic conversion to common stock. This variable is relevant only if the investors hold participating preferred equity.

2.3. Summary Statistics

I merge each contract with its corresponding round in Venture Economics and supplement these data with hand-coded information on founder characteristics. Table 1 presents the summary statistics. The representativeness of the sample is reflected in the high rate of representation of the major hotbeds of the

U.S. VC industry (California and Massachusetts) and the large fractions of companies from the life science and high technology industry groups. At the time of financing, the average company is 2.3 years old, which means that most investments (82%, unreported statistics) reflect seed or early-stage financings. About 1 in 5 companies has a founder who has previously started a venture-backed company, and fewer than 1 in 10 companies has a founder whose previous venture-backed company either went public or was acquired. The average round amount is \$7 million, and the postmoney valuation, which is a negotiated term that determines the equity ownership stake that VCs receive in exchange for their investment, is \$20 million.⁴ A majority of the financing rounds (77%) are raised from more than one venture capitalist. For such syndicated rounds, I define the venture capitalist who provides the greatest amount of capital as the lead venture capitalist.⁵ I note that most lead VCs (86%) are organized as independent private partnerships. The remaining lead VCs are investment branches of banks or insurance companies (4%), investment branches of corporations (2%), government-affiliated programs (3%), private equity firms (2%), incubators (1%), angel networks (1%), and venture consulting firms (1%).

3. Overview of VC Contracts

The inclusion of covenants in VC contracts is part of a complex and carefully tailored allocation of control rights and cash flow contingencies between one or more VCs and an associated entrepreneur (Sahlman 1990, Kaplan and Strömberg 2003). Although this paper focuses on covenants, the economic role of these control rights cannot be understood unless examined in the context of other contract terms. For the purposes of my study, it is also essential to understand how control rights and cash flow contingencies are allocated because I exploit the variation along these dimensions in my cross-sectional tests, which are presented in §5.

3.1. Common Stock and Preferred Stock

Venture-backed companies generate two types of equity securities: common stock and preferred stock. Common stock, which reflects fractional company ownership, is held by founders, employees, business

angels, and other non-VC shareholders. The CEO of a venture-backed company typically enjoys a sizeable common stock holding in the form of vested shares, unvested shares, options, and warrants.⁶ VCs almost exclusively hold preferred stock, which entitles them to fractional company ownership (i.e., an equity-like component) and/or a fixed payoff (i.e., a debt-like component). As reported in Table 2, VCs hold on average 29% of the outstanding stock (on an as-converted basis) for the financing rounds represented in my sample. The size of a venture capitalist's fixed payoff depends on the inclusion of cash flow contingencies such as cumulative dividends, liquidation preference, and participation rights. The precise implications of VC payoffs are discussed below. Figures 1–6 present graphical illustrations of six relevant cases. Figure 1 illustrates a VC contract with the least debt-like payoff, Figures 2–5 illustrate intermediate cases, and Figure 6 illustrates a VC contract with the most debt-like payoff.⁷

It is important to note that my focus is on cash flow contingencies that affect how the final payoffs are split between an entrepreneur and any associated VCs. I therefore do not analyze the myriad of contract terms that affect how VCs could exit an investment (e.g., redemption, piggyback, drag-along, and tag-along rights). I do not have data on vesting schedules so I am unable to include them in my analysis. I also do not analyze contract terms that do not exhibit sufficient variation in my sample (e.g., antidilution rights). Despite these caveats, the contract terms I study are generally viewed by VCs, lawyers, and entrepreneurs as important and carefully negotiated.

It is also important to note that the cash flow contingencies in a VC contract have payoff consequences only if the company is exited at a multiple above $1\times$ of the venture capitalist's initial investment. If the exit multiple is at or below $1\times$, then the venture capitalist captures the full proceeds without regard to which contingencies are included (because all contracts have at least a $1\times$ liquidation preference). Metrick and

⁶ For companies that have raised the first VC round, the average equity ownership of U.S. venture-backed companies is about 9% for nonfounder CEOs and 12% for founder CEOs (Bengtsson and Hand 2011).

⁷ Each figure illustrates how a tailor-made allocation of cash flow contingencies in VC contracts (i.e., cumulative dividends, participation, and automatic conversion) affects the size of a venture capitalist's debt-like claim at company exit. To create a figure, I first calculate, for a range of company exit values (enterprise value), the VC payoff if the investor obtains both equity ownership and cash flow contingencies. I then calculate the VC payoff if the investor obtains only equity ownership. I finally calculate the difference between these two, which I label "VC payoff in excess of equity ownership." The figures are drawn to scale except that the hurdle for automatic conversion is set artificially low so that the relevant breakpoints are more clearly illustrated.

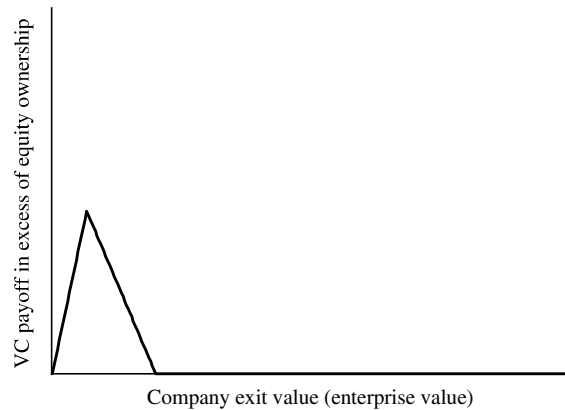
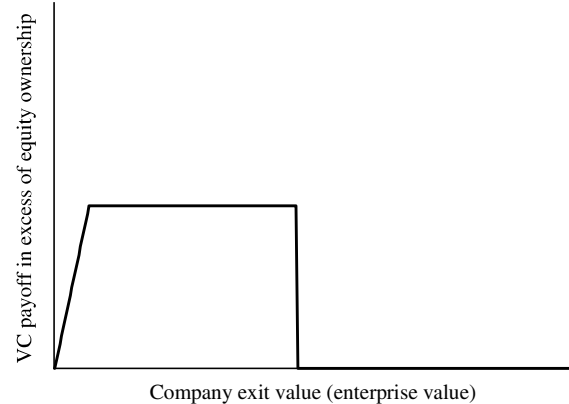
⁴ Data on postmoney valuations, which come from Venture Economics, is available for only 77 of the 182 contracts in my sample. Importantly, I do not screen for this variable and do not use it in my analysis.

⁵ In rounds where two or more VCs invest the same amount, I define the oldest VC firm as the lead venture capitalist. The results are unchanged if I use other reasonable means of identifying the lead venture capitalist (e.g., investment experience, success rate).

Table 2 Overview of Covenants

Fraction (%)	Covenant name	Fraction (%)	Covenant description
Panel A—Covenants always included in VC contracts			
100	Basic protection	100	Change the size of the Board of Directors.
		100	Change voting rules (including those that apply to covenants).
		100	Amend bylaws, corporate charter, or Certificate of Incorporation.
		100	Take actions that would alter the rights of preferred shares in a negative way.
		100	Exchange, reclassify or cancel any of the outstanding shares.
100	Disbursement and issuance	100	Pay dividends to common stock or preferred stock, except as outlined in contract. For some contracts, dividends that are paid out in common stock are allowed.
		100	Redeem, retire, purchase, or acquire shares (except those related to termination of employment or director agreement).
		100	Authorize or issue equity securities senior to preferred shares, including debt that converts into such equity.
		100	Authorize or issue equity securities that are <i>pari passu</i> to preferred shares, including debt that converts into such equity.
100	Company exit	100	Liquidate or wind up company. Enter into bankruptcy procedure.
		100	Be subject to merger or acquisition. Sell, lease, or license out all or substantially all assets of company. For some contracts, a merger above a certain transaction value is allowed.
Panel B—Covenants included selectively in VC contracts			
60	Issue debt	60	Issue debt above a certain amount as outlined in the contract.
58	Issue junior security	58	Authorize or issue equity securities junior to preferred shares, including debt that converts into such equity.
27	Change business	24	Change current line of business.
		8	Enter into new line of business.
		2	Exit current line of business.
41	Sell assets	8	Pledge assets or enter into agreement that results in a lien of assets.
		23	License out technology (except as part of ordinary course of business).
		16	Sell assets (except as part of ordinary course of business).
		14	Sell subsidiary or sell shares in subsidiary.
		2	Make decision that adversely affects taxation of preferred shares
7	Change competitive ability	4	Enter into joint venture or strategic alliance.
		3	Enter into major transaction with nonaffiliate of the company.
		1	Take action that adversely affects the competitive nature of the business.
8	Investment	7	Incur capital expenditure above a certain amount as outlined in the contract.
		3	Make changes to the operating budget of the company.
31	Buy assets	24	Acquire another company or acquire shares in another company.
		13	Acquire assets (except as part of ordinary course of business)
		10	Create a subsidiary (for some contracts, subsidiaries that are not fully controlled by the company can be created).
10	Hire management	9	Replace current CEO.
		5	Replace current senior manager or key employee (contract typically outlines explicitly relevant job functions).
		1	Make changes to employment contracts.
24	Change compensation	5	Change cash compensation to CEO, senior manager, key employee, or director.
		20	Change current stock option plan or adopt a new stock option plan.
19	Inside transaction	19	Enter into transaction with affiliate of the company.
5	Monitoring		Change headquarter location of the company. Change company auditor or auditing procedures.
4	Company exit	1	Hire investment banker.
		3	Undertake public offering (IPO). In some contracts, public offering above a certain transaction value is allowed.

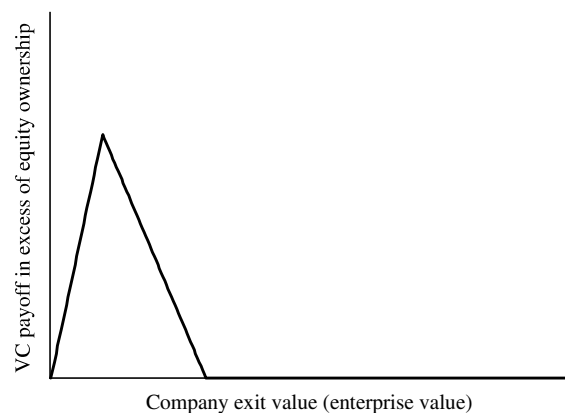
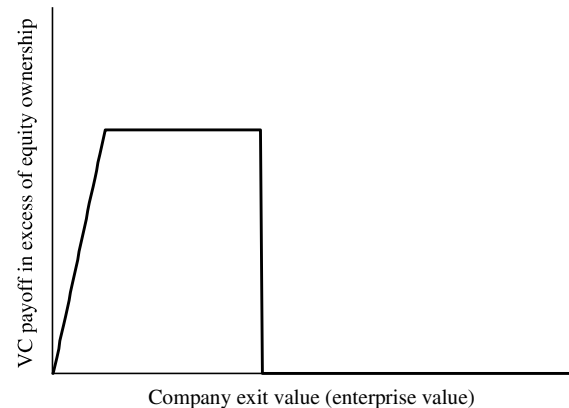
Notes. This table reports the sample frequency of covenants, each of which prevents the entrepreneur from taking a specific action unless the preferred shareholders (VCs) approve. Panel A lists covenants that are included in all contracts in our sample. Panel B lists covenants that are included selectively (i.e., not always) in VC contracts.

Figure 1 Convertible Preferred Without Cumulative Dividends**Figure 3** Participating Preferred With Low Automatic Conversion Hurdle and Without Cumulative Dividends

Yasuda (2010, p. 128) report statistics, estimated by Sand Hill Econometrics, on the distribution of exit multiples in first-round VC investments. About 49% of all investments have a zero multiple and an additional 25% have a multiple below 1×. The cash flow contingencies are therefore above 1× and thus matter for about 26% of all first-round investments. However, as I describe in detail below, the contingencies matter for these investments only if a company has an acquisition or an initial public offering (IPO) with an enterprise value below the stated automatic conversion enterprise value.

3.2. Cash Flow Contingencies and Fixed Payoff to VCs

3.2.1. Cumulative Dividends and Liquidation Preference. When a venture-backed company is sold or otherwise exited, VCs have the contractual right to claim a fixed payoff on their preferred stock that is senior to the payoff on common stock. Such a (debt-like) payoff comes from two investor-friendly cash flow contingencies: liquidation preference, which is expressed as a multiple (1×, 2×, etc.) of the initial investment, and cumulative dividends, which

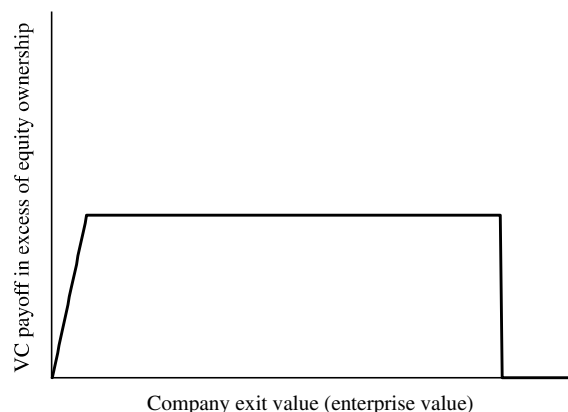
Figure 2 Convertible Preferred With Cumulative Dividends**Figure 4** Participating Preferred With Low Automatic Conversion Hurdle and With Cumulative Dividends

are expressed in terms of an annual rate. Because my sample exhibits little variation in the liquidation preference (only five contracts have a multiple that is other than 1), I am unable to study how this cash flow contingency varies with the inclusion of covenants.⁸ As reported in Table 1, the variation in cumulative dividends is pronounced, with 46% of the sample contracts providing such dividends. Cumulative dividends are incurred annually but are not paid out until a company is sold or otherwise exited. The average dividend rate in my sample is 7.4%. Assuming that a venture-backed company takes about five years to realize an exit, this corresponds to a fixed senior payoff of about 40% of the initial investment amount.⁹

⁸ The empirical results presented in §6 remain qualitatively similar if I include the liquidation preference in the *Cumulative Dividends* variable (taking the value 1 if the liquidation preference is above 1× or if cumulative dividends present, and 0 otherwise).

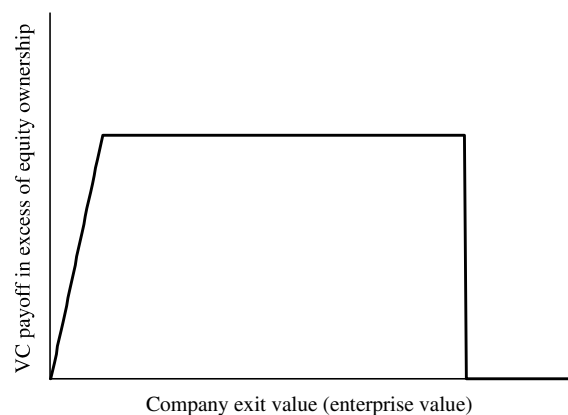
⁹ This calculation assumes that (i) the exit proceeds are sufficiently large to pay the cumulative dividends in full and (ii) the company does not undertake an IPO with an offer price above the automatic conversion threshold level.

Figure 5 Participating Preferred With High Automatic Conversion Hurdle and Without Cumulative Dividends



3.2.2. Participation. Preferred shares given to VCs could take the form of either convertible preferred stock or participating preferred stock. Participating preferred stock is more favorable than convertible preferred stock because, with such preferred stock, VCs can “double-dip” by receiving both fixed payoffs (from liquidation preferences and cumulative dividends) and payoffs based on fractional company ownership. With convertible preferred stock, VCs must choose between fixed payoffs and fractional ownership payoffs. This choice is made when a company is sold, goes public, or is liquidated. Thus, for a range of relevant exit values, VCs receive fixed payoffs only if their preferred stock holdings include participation rights. In some contracts in my sample, participation is capped, which means that VCs receive payoffs from liquidation preferences (and sometimes from cumulative dividends) only if total exit payoffs expressed as multiples of initial investment amounts are below predetermined hurdles. As reported in Table 1, about 70% of the contracts in my sample

Figure 6 Participating Preferred With High Automatic Conversion Hurdle and With Cumulative Dividends



involve participating preferred stock and 30% involve convertible preferred stock.¹⁰

3.2.3. Automatic Conversion Enterprise Value. The fixed payoff component of VCs’ preferred stock holdings is also directly related to the contractual term automatic conversion, which specifies that all cash flow contingencies that grant VCs liquidation preferences and cumulative dividends will be annulled if a company’s enterprise value at the IPO is sufficiently high (as defined in the contract). Although including such an automatic conversion is boilerplate practice in VC contracts, the minimum enterprise value needed for such a conversion varies by contract. The higher this figure, the wider the range of enterprise values at which VCs receive fixed payoffs from cumulative dividends and liquidation preferences. Put differently, a higher automatic conversion hurdle implies that a company has to be more successful in order to eliminate differences between preferred stock and common stock. I create a dummy, *Automatic Conversion*, that takes the value 1 when the automatic conversion enterprise value is above the median and the contract has participation, and zero otherwise—automatic conversion is a binding constraint for a venture capitalist’s payoff only if the security exhibits the participation feature.¹¹ *Automatic Conversion* takes the value 1 for 36% of the sample contracts. My findings are robust to an alternative method, using the automatic conversion multiple or the automatic conversion dollar amount that needs to be raised in the IPO.

3.3. VC Control via Board of Directors

VCs obtain control over companies in which they invest by acquiring board seats.¹² Influence over decisions made by boards of directors is commonly viewed as among the most effective governance mechanisms in VC investments (Lerner 1995, Kaplan and Stromberg 2003, Baker and Gompers 2003, Fried and Ganor 2006, Hochberg 2008, Wongsunwai 2010). Summary statistics on board seat allocation for my sample of VC contracts are reported in Table 1. In all

¹⁰ The empirical results presented in §6 remain qualitatively similar if I include a trinary variable that captures whether a venture capitalist’s preferred stock was (i) participating without a cap, (ii) participating with a cap, or (iii) nonparticipating.

¹¹ In some contracts the automatic conversion enterprise value is stated explicitly, whereas in other contracts I calculate the value by multiplying the per-share threshold amount with the number of outstanding shares.

¹² VC contracts include provisions that grant VCs additional exit rights, such as the right to sell back shares (redemption), to register shares at an IPO (piggyback), to sell shares in an acquisition (tag-along), and to force other shareholders to sell shares on acquisition (drag-along). With the exception of redemption, these provisions are not mentioned in the legal filings I study.

sample companies, at least one board seat is held by a venture capitalist who invested in the round. On average, VCs hold 2.1 board seats, common shareholders hold 1.7 board seats, and 1.4 board seats are given to “outsiders” who are individuals elected jointly by common shareholders and VCs. Each board of directors falls into one of three categories based on the degree of VC control. The first category, *VC Board Majority*, includes the 18% of the sample companies in which VCs hold a majority of the board seats. In these companies, VCs have complete control over board decisions. The second category, *VC Board Majority With Outsiders*, includes the 18% of companies in which VCs occupy a majority of the board votes only if one or more outsiders sides with the VCs. The third category, which comprises the remaining 64% of the sample, includes companies in which VCs cannot make a board decision without the support of at least one board member appointed by common shareholders.¹³

When VCs do not control the majority of the board seats in a company, they must rely on selectively negative covenants that confer on them the right to veto certain operational and financial decisions. It is worth noting that VCs may need some degree of covenant protection *even* in cases in which they have board majorities, because fiduciary duty limits the exercise of board power on the part of VCs. Board members are prohibited by law from making decisions that favor one class of shareholders at the expense of another class.¹⁴ Such legal limitations are much weaker for decisions made by investors in their role as shareholders. This explains why VCs could rely on covenants even when they have a majority of the board seats.

4. Overview of Covenants in VC Contracts

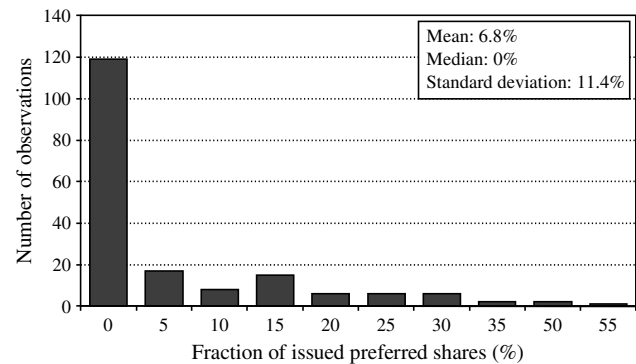
4.1. Structure of Covenants

Contracts involving bank loans or bonds typically include various financial covenants, according to which a company has to maintain a specific value of net worth, working capital, interest coverage, or

¹³ In an untabulated analysis, I find that VCs' equity ownership has a 35% correlation with *VC Board Majority Without Outsiders* and a 29% correlation with *VC Board Majority With Outsiders*. These low correlations show that the allocation of board seats is frequently decoupled from equity ownership in venture-backed companies (Kaplan and Strömberg 2003).

¹⁴ Fried and Ganor (2006) present evidence that in some recent cases the fiduciary duty requirement on board members has not been enforced by the courts. Nevertheless, my own interviews with lawyers and VC partners reveal that VCs are cautious about making self-serving decisions as board members for fear of future litigation.

Figure 7 Fraction of Preferred Shares Issued in the Financing Round VCs Must Keep in Order to Have the Right to Cast a Covenant Vote ($N = 182$)

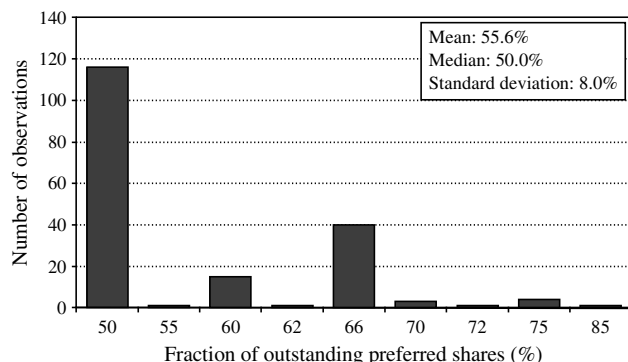


some other financial ratio. Such financial covenants appear never to be included in VC contracts, most likely because the intangible, risky, and high-growth nature of venture-backed companies makes the relevant accounting numbers volatile, uninformative, and easy for the entrepreneur to manipulate. VC contracts include other noncovenant protections that share some similarity with financial covenants. For example, performance milestones make future financing contingent on a company's achieving certain financial or operational goals. Antidilution provisions imply a repricing of an entrepreneur's equity if a follow-up financing round yields a lower valuation. I do not analyze these contract terms because my data do not include a complete listing of such contractual features. Also, because these contract terms are functionally very different from debt covenants, it would be difficult to argue that their inclusion is motivated by the logic that governs covenants in bank loans and bonds.

All covenants in my sample are negative covenants or protective provisions, which specify explicitly the decisions over which preferred shareholders (VCs) have veto rights. These covenant protections are subject to two conditions. The first is that a venture capitalist must keep a predetermined number of preferred shares issued in the financing round to have the right to cast a covenant vote. In other words, a venture capitalist can lose the right to cast a covenant vote if she sells or otherwise disposes of a certain number of preferred shares. Figure 7 presents a histogram of this minimum fraction. Approximately two out of three contracts require VCs to keep no more than one preferred share. Only 2% of all contracts require VCs to keep a majority of such preferred shares. I infer from these low fractions that the protection implied by covenants typically remains in place even if VCs dispose of a substantial portion of their equity holdings.

The second condition is that a certain fraction of outstanding preferred shares held by VCs must vote

Figure 8 Fraction of Outstanding Preferred Shares That Must Vote in Favor of Vetoing a Decision Covered by a Restrictive Covenant ($N = 182$)



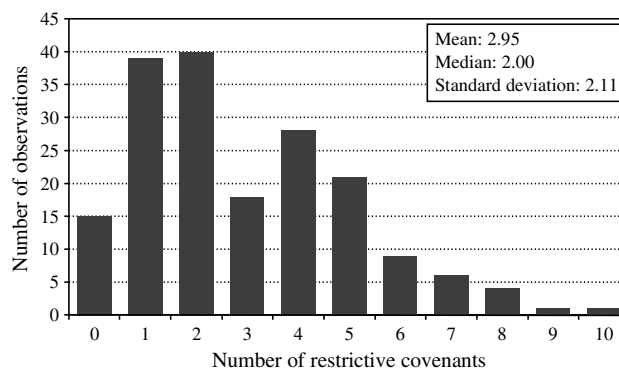
in favor of vetoing a decision covered by a covenant. As illustrated in Figure 8, all contracts in my sample require that at least a 50% majority of the preferred shares support a veto and about one-quarter (27%) of all contracts require the support of two-thirds or more. I observe that the fraction is higher when a greater number of VCs invest in the financing round. Thus, covenant votes appear to be structured such that most of the investing VCs must agree to veto a decision.

4.2. Covenants Always Included

Table 2 summarizes the covenants in my sample of VC contracts. Panel A lists covenants that are “boilerplate” standard protective provisions in 100% of the contracts in my sample. Boilerplate covenants prevent entrepreneurs from changing contractual VC control rights by various means or altering any of the rights, privileges, or preferences that are attached to VC-held preferred stock. Such covenants also prevent claim dilution (when companies issue new shares of the same series of preferred stock or of any other type of equity that is senior or pari-passu to the preferred stock) and prohibit companies from redeeming or repurchasing common shares except as the result of a cancelled employment, director agreement, or issuing dividends to common shareholders. There are also boilerplate covenants requiring preferred shareholder approval of liquidations, acquisitions, and mergers.¹⁵ Overall, boilerplate covenants play an important economic role by providing basic safeguards for VCs’ preferred stock.

¹⁵ In two recent court cases (*WatchMark Corp. v. Argo Global Capital LLC* and *Benchmark Capital Partners IV, LP v. Vague*), VCs argued that the rights attached to their preferred stock were adversely affected by mergers. Because these contracts did not include covenants that specifically restricted acquisitions or mergers, the VCs lost these cases.

Figure 9 Number of Restrictive Covenants Used Selectively ($N = 182$)



4.3. Covenants Included Selectively

I turn now to covenants that are included selectively, which are the focal point of my analysis. I identify 12 types of functionally distinct covenants. As reported in Figure 9, all but 8% of the sample contracts feature at least one covenant that is included selectively. Counting only covenants that are included selectively, the average number of covenants is 2.9, and about 25% of the sample includes five or more covenants. The correlation matrix for the covenants, which is untabulated, contains almost exclusively positive elements, most of which are statistically significant. Table 2, panel B lists selective covenant types, describes their respective formulations, and reports frequency of use. For the sake of clarity, I characterize each covenant type by reference to the type of agency problem it addresses, admittedly a somewhat arbitrary approach, in particular with respect to covenants that address multiple types of agency problems. On the whole, this characterization lends support to the argument that covenants are in place to mitigate conflicts of interest between VCs and entrepreneurs.

4.3.1. Covenants Related to Claim Dilution. An entrepreneur can decrease the value of preferred VC shares by issuing debt and investing the proceeds in company operations. A company’s VCs bear a disproportionate cost of this debt issuance because the debt-like payoff portion of their preferred stock becomes junior to the newly issued debt. More than half of all VC contracts (60%) include covenants that restrict a company’s ability to issue debt, although most contracts permit issuances of small amounts of debt without VC approval. The median maximum debt that can be outstanding without VC approval is \$225,000. Section 5.6 of the paper analyzes the determinants of the maximum debt amount. About 1 in 10 contracts includes a debt covenant that prohibits debt issuance of any amount.

VCs may also want to restrict an entrepreneur from issuing equity to avoid diluting VC ownership stakes. Although provisions that prohibit issuing senior or

pari-passu equity securities are boilerplate in VC contracts, restrictions on issuing equity securities that are junior to the outstanding preferred stock are included more selectively. About 58% of all contracts include covenants that grant veto rights to VCs with respect to either junior preferred stock or common stock.

4.3.2. Covenants Related to Asset Substitution and Overinvestment. An entrepreneur could also increase the value of a company's common stock through asset substitution, by selling off assets or changing either the company's business model or its overall competitiveness. My analysis of boilerplate VC covenants indicates that VCs always have the right to veto the sale of all a company's assets via acquisition or merger. I find that restrictions on the sale or transfer of partial assets are also common (found in 41% of the sample contracts). About one in four contracts (27%) includes covenants that I designate as "change business"; these prohibit an entrepreneur from entering, changing, or exiting a line of business. A less common type of covenant (found in 7% of the sample contracts) restricts entrepreneurial decisions that may affect a company's competitiveness. Such a covenant can prohibit a company from entering into major transactions or forming joint ventures or strategic alliances with another company entity. As reported by Lindsey (2008) and Ozmel et al. (2007), strategic alliances are common among venture-backed companies and can affect outcomes.

An entrepreneur can also increase the probability of a successful company outcome through aggressive investments, so about 1 in 10 contracts (8%) limits an entrepreneur's ability to make capital expenditures or change the operating budget of the company. Some contracts explicitly specify an amount above which an entrepreneur must seek VC approval, but many use vague expressions such as "unless as part of the ordinary business operations." A functionally related type of covenant that is common in my sample (in almost one in three contracts) prevents entrepreneurs from buying material assets or acquiring other companies.

4.3.3. Covenants Related to Employee Matters. About 10% of my sample contracts include covenants according to which a company cannot hire a new CEO or senior manager without preferred shareholder approval. Such a veto right matters because human capital is such a critical aspect of venture-backed companies. The relatively low frequency of hiring covenants is somewhat surprising in light of arguments that the composition of top management is often hotly contested in VC investments (Hellmann 1998). Another type of employee-related covenant restricts major changes in cash and equity compensation for CEOs and senior managers, and in some cases

also for lower-level employees. Although restrictions related to stock option plans are included in a quarter of all contracts, changes in employee cash compensation are restricted in only 1 in 20 contracts. About one in five (19%) of the sample contracts also prevents an entrepreneur or a company employee from entering into a lending relationship or other type of financial transaction with the company.¹⁶

4.3.4. Other Covenants. One in 20 (5%) of the sample VC contracts includes a covenant I label "monitoring." A monitoring covenant captures two somewhat different types of restrictions that relate to the ability of VCs to monitor entrepreneurial decisions. First, monitoring covenants prevent entrepreneurs from changing accounting firms or auditing procedures, which can prove important when an entrepreneur wants to switch to an auditor that is less meticulous or provides greater leeway in business decisions and financial reporting. A second monitoring restriction prevents a company from relocating its headquarters, which an entrepreneur might want to do for lifestyle reasons or to reduce VC oversight.

Finally, 4% of the sample contracts restrict entrepreneurs from hiring investment bankers or undertaking IPOs without VC approval. Although VCs often have no objections to their portfolio companies' going public, they may sometimes prefer to sell a successful company to a strategic buyer for a similar valuation. The automatic conversion feature of VC contracts can cause preferred shareholders to lose their fixed payoffs (cumulative dividends and liquidation preferences) if a company undertakes a successful IPO. Because similar provisions regarding acquisition exits occur significantly less frequently, entrepreneurs may prefer an IPO to an acquisition (Hellmann 2006, Cumming 2008).

5. Determinants of Covenants in VC Contracts

5.1. Aggregation of Covenant Protection

Section 4 establishes the prevalence of covenants in VC contracts and illustrates the important economic role they play in VCs' financing of entrepreneurs. I now discuss the results of my cross-sectional tests of the determinants of these covenants. I restrict my attention to selective covenants because boilerplate covenants (by definition) exhibit no variation. My

¹⁶ Restrictions on compensation changes and financial transactions are in place to prevent an entrepreneur from engaging in self-dealing and transferring a company's money into his or her own pocket. Also, an entrepreneur typically knows most of his or her employees well and may derive benefits from granting generous financial packages. Cronqvist et al. (2009) provide empirical evidence in support of this agency problem.

analysis is based on the aggregate covenant protection of a VC contract, which I measure by a number count of the selective covenants. This aggregation method assumes, incorrectly, that each covenant is an equally important part of a VC contract. The advantage of using a number count is, however, that this is the simplest and thereby the most transparent aggregation method. As discussed in §5.4., the correlations I document hold for most individual covenants, so my results would remain qualitatively the same even if I used other aggregation methods.

5.2. Univariate Results

Table 3 reports the number of covenants for subsamples formed based on other features of a VC contract. Panel A compares VC contracts that include no investor-friendly cash flow contingencies with contracts that include cumulative dividends, participation rights, and above-median automatic conversion enterprise value (conditional on participation). I find that the most debt-like contracts (whose features include *No VC Board Majority* and the highest *Sum of Cash Flow Contingencies*) include, on average, 3.1 covenants. This is about 50% more than the average number, 2.0 covenants, for the most equity-like contracts (whose features include *VC Board Majority* and the lowest *Sum of Cash Flow Contingencies*). This difference represents about one-half of a standard deviation of the empirical distribution of the number of covenants in my sample.

In panel B, I specifically investigate the relationship between board control and covenants. Contracts for which VC board members are in the majority have on average 2.5 covenants. By comparison, the number of covenants is 3.1 for contracts that require that at least one board member appointed by the common shareholders sides with VCs in a board decision. The difference of 0.6 covenants represents about one-third of a standard deviation of the empirical distribution of the number of covenants in my sample. I infer from this result that the specific control rights implied by covenants are more often granted to investors who have weaker residual control rights. I also note that covenants are still relatively common in contracts that grant VCs complete control over board decisions. Overall, these univariate comparisons support the theoretical argument that a financier receives stronger covenant protections when her financial contract includes a larger fixed payoff and no residual control rights in the form of a board majority.

In panels C, D, and E, I consider how the inclusion of covenants varies with each of the three cash flow contingencies that I study in this paper. Contracts that grant VCs the right to receive cumulative dividends include 0.8 more covenants than do contracts that grant no cumulative dividends to VCs. This

Table 3 Univariate Comparisons of Number of Covenants

A. <i>Sum of Cash Flow Contingencies</i> (dividends, participation, above median auto. conv.)			
	Regardless of board majority	No VC board majority	VC board majority
3 (maximum = all)	3.5	3.1	4.7
0 (minimum = no)	1.9	1.9	2.0
Difference 3 – 1	1.6***	1.2**	2.7*
B. <i>VC Board Majority</i> (VC controls a majority of the board seats)			
	No VC board majority	VC board majority	Difference
Full sample	3.1	2.5	0.6*
C. <i>Cumulative Dividends</i> (= VC entitled to fixed payoffs)			
	Regardless of board majority	No VC board majority	VC board majority
Dividends	3.4	3.4	3.2
No dividends	2.6	2.8	1.8
Difference	0.8**	0.6	1.4*
D. <i>Participation</i> (= VC not forced to choose between fixed payoffs and equity upside, but gets both)			
	Regardless of board majority	No VC board majority	VC board majority
Participation	3.2	3.3	2.7
No participation	2.3	2.4	1.8
Difference	0.9***	0.9***	0.9
E. <i>Automatic Conversion</i> (= IPO enterprise value needed to eliminate VC's fixed payoffs)			
	Regardless of board majority	No VC board majority	VC board majority
Above median and participation	3.1	3.2	3.0
Below median, or no participation	2.9	3.0	2.0
Difference	0.2	0.2	1.0

Notes. The sample comprises first-round VC financing contracts from U.S. companies. Reported numbers represent sums of covenants used selectively in VC contracts. See panel A of Table 2 for a complete description of the covenants. *Sum of Cash Flow Contingencies* adds together *Cumulative Dividends* (1 = present, 0 = not), *Participation* (1 = present, 0 = not), and *Automatic Conversion* (1 = above median enterprise value if participation, 0 = below median enterprise value or no participation). *VC Board Majority* (1 = present, 0 = not) means that VCs hold a majority of the board seats regardless of how outside board members vote. Differences tested with Wilcoxon test.

*Significance at the 10% level; **significance at the 5%; ***significance at the 1% level.

difference is significant at the 5% level. Similarly, contracts that grant VCs participation rights include 0.9 more covenants, a difference that is significant at the 1% level. Contracts with *Automatic Conversion* (above median and participation) include 0.2 more covenants than other contracts do.

5.3. Multivariate Results

5.3.1. Regression Setup. To confirm that the above-discussed results hold after controlling for other contract determinants, I run a set of multivariate negative binomial regressions in which the number of covenants is the dependent variable. Because my sample companies are privately held, I am unable to include controls that measure accounting numbers or other variables that are available for publicly held companies. To proxy for company characteristics that previous studies have shown to determine the design of VC contracts, I include company age, industry dummies (10 industry groups based on Venture Economics classification), the dollar amount of the financing round (which is likely to be greater for higher-quality companies), and variables capturing the background of the founding team. I also include the number of VCs in a round, the lead venture capitalist's experience (proxied by historical number of portfolio companies), and a dummy that takes the value 1 if the lead venture capitalist was organized as a private partnership and 0 otherwise.¹⁷

I further control for geographical factors by including dummies for company location (California, Massachusetts, Texas, or New York). Bengtsson and Ravid (2010) show that contracts in California include fewer investor-friendly control rights and cash flow contingencies. I also include as a dummy "VC and Company in Same State," which takes the value 1 if the lead venture capitalist and company are located in the same U.S. state and 0 if they are located in different states.

In untabulated tests, I also control for the state of incorporation of a company. Broughman and Fried (2010) indicate that there is a difference in the balance of power between VCs and associated entrepreneurs when a company is incorporated in Delaware as compared with being located in other U.S. states. I observe no direct association between the number of covenants and state of incorporation and find that controlling for the latter does not qualitatively change any of the reported coefficients.

5.3.2. Main Results. I present the regression results in Table 4. The relationship between covenants and VC board majority is established in model 1. In model 2, I show that this relationship is found only when VCs have their own majority of board seats (*VC Board Majority*) and not when this majority requires the support of outside board members (*VC Board Majority With Outsiders*). This result indicates that, even though outsiders are typically allied

with VCs (Fried and Ganor 2006), VCs do not count on the full support of outside board members when negotiating covenants.

In model 3, I include as a variable *Sum of Cash Flow Contingencies*, which is the sum of the *Cumulative Dividends*, *Participation*, and *Automatic Conversion* dummies. I establish a statistically significant positive correlation between the number of cash flow contingencies and the number of covenants, which confirms the theoretical expectation. In model 4, I instead include a dummy for *Cumulative Dividends*, which I find is positive and statistically significant in the univariate comparison. Although the coefficient on this cash flow contingency remains positive in multivariate regressions, it is no longer statistically significant. The regression analysis confirms that participation rights are associated with there being more covenants (model 5). Similarly, model 6 includes *Automatic Conversion* and shows that this cash flow contingency is positively correlated with the number of covenants.¹⁸

Overall, the results from the multivariate regressions largely confirm the univariate finding that the inclusion of covenants is negatively related to VC board control and positively related to investor-friendly cash flow contingencies that translate into higher fixed payoffs to VCs.

5.3.3. Other Results. The multivariate regressions also show that the number of covenants is lower when a greater number of VCs invest in a financing round. Because the difference in number of VCs in the round is established even after controlling for the amount raised in the financing round, I infer that this result is not explained by some companies' raising more venture financing from a larger pool of investors. Having more VCs in the round could make it harder to enforce covenants, because each individual venture capitalist has a weaker monitor incentive and faces higher "haggling" costs with other VCs (Rajan and Winton 1995). The finding that covenants are more commonplace when there are fewer VCs in the round supports my conclusion that VCs negotiate covenants to overcome conflicts of interest with entrepreneurs rather than with other VCs in the syndicate. VC contracts for unsyndicated financing rounds, in which there are no interactions among VCs, include, on average, 3.2 covenants.

The number of restrictive covenants also depends on the maturity of a company at the time of the first financing round. Older companies have contracts with a greater number of covenants than those for younger companies. Kaplan and Strömberg (2003) and Bengtsson and Sensory (2011) note a similar

¹⁷ In untabulated tests, I show that replacing *VC Experience (Portfolio Size)* with *VC Age* or *VC IPO Ratio* does not qualitatively affect the results of the multivariate regressions.

¹⁸ In untabulated tests, I obtain qualitatively similar results if I replace *Cumulative Dividends* with the annual dividend rate.

Table 4 Regressions on Number of Covenants

Specification	1	2	3	4	5	6	7
<i>VC Board Majority</i>	-0.256* [0.144]	-0.338* [0.176]	-0.313** [0.140]	-0.273* [0.143]	-0.292** [0.139]	-0.280** [0.142]	-0.305** [0.140]
<i>VC Board Majority With Outsiders</i>		0.122 [0.151]					
<i>Sum of Cash Flow Contingencies</i>			0.186*** [0.055]				
<i>Cumulative Dividends</i>				0.157 [0.121]			0.103 [0.118]
<i>Participating Preferred</i>					0.419*** [0.116]		0.388*** [0.133]
<i>Automatic Conversion (above median IPO enterprise value if participation)</i>						0.221** [0.112]	0.036 [0.125]
<i>Number of VCs in Round</i>	-0.090** [0.039]	-0.098** [0.040]	-0.101*** [0.038]	-0.091** [0.039]	-0.100*** [0.038]	-0.096** [0.039]	-0.101*** [0.038]
<i>Company Age</i>	0.218*** [0.074]	0.225*** [0.074]	0.185** [0.072]	0.194** [0.076]	0.212*** [0.071]	0.216*** [0.073]	0.196*** [0.073]
<i>Total Round Amount (\$ million, log)</i>	-0.017 [0.077]	-0.03 [0.078]	-0.024 [0.076]	-0.008 [0.077]	0.019 [0.076]	-0.051 [0.079]	0.014 [0.080]
<i>Serial Founder</i>	-0.035 [0.163]	-0.03 [0.163]	0.008 [0.159]	-0.005 [0.164]	-0.044 [0.159]	-0.023 [0.162]	-0.02 [0.160]
<i>Serial Successful Founder</i>	-0.063 [0.259]	-0.058 [0.259]	-0.199 [0.255]	-0.096 [0.259]	-0.16 [0.253]	-0.126 [0.259]	-0.185 [0.254]
<i>VC Experience (Portfolio Size)</i>	-0.01 [0.039]	-0.01 [0.039]	0.01 [0.038]	0.001 [0.040]	0.001 [0.038]	-0.009 [0.038]	0.008 [0.039]
<i>VC Partnership</i>	0.238 [0.153]	0.237 [0.153]	0.241 [0.150]	0.231 [0.153]	0.264* [0.150]	0.236 [0.152]	0.258* [0.150]
<i>Industry, Location, Year Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	182	182	182	182	182	182	182
Pseudo R-squared	0.05	0.05	0.07	0.05	0.07	0.06	0.07

Notes. See Table 1 for overview of sample and Table 2, panel B for overview of covenants. Negative binomial regressions where the dependent variable is the number of restrictive covenants used selectively in VC contracts. *Sum of Cash Flow Contingencies* adds together *Cumulative Dividends* (1 = present, 0 = not), *Participation* (1 = present, 0 = not), and *Automatic Conversion Enterprise Value* (1 = above median enterprise value if participation, 0 = below median enterprise value or no participation). All regressions control for industry (10 groups based on VentureEconomics classification), company location (California, Massachusetts, Texas and New York), contract year, and *VC and Company in Same State*. Standard errors are in brackets.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

empirical association between company age and the number of investor-friendly cash flow rights in a VC contract. One explanation for this result is that younger entrepreneurial companies typically have too few valuable assets and too low a salvage value in case of an unsuccessful outcome to motivate an investor-friendly allocation of control and cash flow rights.

In an unreported table, I replicate my multivariate regression analysis for subsamples formed on various proxies for the distance between the company and the lead venture capitalist (10 miles, 50 miles, and same state). These tests should shed further light on the argument that shorter distance enables VCs to exercise more effective noncontractual governance and thereby worry less about contractual governance (Lerner 1995, Tian 2011, and Bengtsson and Ravid 2010). I find that the association between the inclusion of covenants and other debt-like features in VC

contracts is statistically significant only for investments made at greater distance. However, when I run a regression model in which I interact distance with the debt-like features, I find no significant coefficients on the interaction variables.

5.4. Individual Covenants

The next step in my analysis is to study the determinants of each of the 12 selectively included covenant types. This step ensures that my results pertaining to the number of covenants applies not to only a few individual covenants but to most. Table 5 presents univariate comparisons of the frequency of each individual covenant type based on subsamples formed by reference to *VC Board Majority* and *Sum of Cash Flow Contingencies*, respectively.

The frequency for 11 of the 12 covenant types is lower when VCs occupy a majority of board seats. Similarly, the frequency for 11 of the 12 covenant

Table 5 Univariate Comparisons of Individual Covenants

	VC Board Majority (%)			Sum of Cash Flow Contingencies (%)				Difference 3–0 (%)	Difference 0, 1, 2, 3
	Majority	No majority	Diff. maj.–No maj.	0	1	2	3		
Issue debt	61	58	3	50	64	59	72	22	
Issue junior security	60	52	8	50	52	68	52	2	
Sell assets	41	39	2	19	41	45	55	36	**
Buy assets	33	24	9	14	32	33	48	34	*
Investment	9	6	3	6	5	12	7	1	
Change business	30	15	15	11	32	29	38	27	**
Change competitive ability	7	6	1	0	5	11	10	10	
Hire management	11	6	5	3	14	12	7	4	*
Change compensation	23	27	–4	31	23	22	24	–6	
Inside transaction	21	9	12	8	36	14	17	9	***
Monitoring	6	0	6	0	7	5	7	7	
Company exit	4	3	1	3	0	4	10	8	

Notes. See Table 1 for overview of sample and Table 2, panel B for overview of covenants. Reported numbers is fraction of VC contracts having a covenant. *VC Board Majority* means that VCs hold a majority of the board seats regardless of how outside board members vote. *Sum of Cash Flow Contingencies* adds together *Cumulative Dividends* (1 = present, 0 = not), *Participation* (1 = present, 0 = not), and *Automatic Conversion Enterprise Value* (1 = above median enterprise value if participation, 0 = below median enterprise value or no participation). Significance of Difference Maj.–No Maj. and Difference 3–0 is tested with Wilcoxon test, and significance of Difference 0,1,2,3 is tested with the Kruskal–Wallis test.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

types is higher when the contract includes the maximum number of cash flow contingencies as compared with when the contract includes the minimum number of cash flow contingencies.¹⁹ Although most of these univariate differences are not statistically significant, the number of significant results is too great to be generated by mere chance. I conclude that my findings pertaining to overall covenant protection reflect a broader pattern of covenant inclusion in VC contracts. This means that the results derived for the number of covenants would be more robust to other aggregation methods than a simple count would be. In untabulated regressions, I show that the results remain qualitatively similar after including various control variables.

5.5. Tightness of Debt Covenant

As discussed in §4, covenants included in VC contracts are restrictive in the sense that they outline decisions over which VCs have veto rights. Thus, unlike financial covenants that specify the ratios a company must maintain, most covenants are binary in the sense that they either grant the venture capitalist the right to block a decision or not. Only two types of covenants specify a range for VC veto rights: investment and issue debt covenants. Because only 13 of the sample VC contracts include a covenant pertaining to capital expenditures, I cannot conduct a reliable statistical analysis of the amount attached to this type

of covenant. Such an analysis is, however, possible for the 110 contracts that restrict how much debt a company can issue without VC approval.

In Table 6, I restrict the sample to contracts that include the issue debt covenant and run multivariate ordinary least squares (OLS) regressions of the log maximum amount of debt as a dependent variable. The debt covenant is significantly tighter (i.e., specifies a lower maximum amount) if VCs have the right to receive cumulative dividends (model 3). Such a covenant is also set more tightly, although not significantly so, if a contract has a higher automatic conversion enterprise value or if VCs hold participating preferred stock. In model 6, I note a weakly significant negative correlation between *Sum of Cash Flow Contingencies* and the tightness of the debt covenant. Finally, I note in Table 6 that the maximum amount of a debt covenant is higher for rounds involving more money (i.e., larger *Total Round Amount*).

On the whole, the analysis of debt covenants provides evidence consistent with the argument that covenant protection is set more tightly with a more debt-like VC contract.

6. Other Explanations

6.1. Endogeneity

The results from the univariate comparisons and regression analysis strongly suggest that the number of covenants is correlated with other dimensions of a VC contract. Because all terms in such a contract stem from one negotiation event, it is difficult to establish a causal relationship between the

¹⁹ The differences for the *Change Compensation* covenant are the opposite of what theory predicts, suggesting that the inclusion of such a covenant is not motivated by the endogenous debt-likeness of a VC contract.

Table 6 Regressions on Maximum Debt Amount Company Can Incur Without Covenant Veto

Specification	1	2	3	4	5	6
<i>VC Board Majority</i>		-0.906 [0.564]	-0.536 [0.581]	-0.898 [0.564]	-0.866 [0.566]	-0.711 [0.566]
<i>Cumulative Dividends</i>			-1.016** [0.491]			
<i>Participating Preferred</i>				-0.463 [0.452]		
<i>Automatic Conversion (above median IPO enterprise value if participation)</i>					-0.413 [0.473]	
<i>Sum of cash flow contingencies</i>						-0.406* [0.220]
<i>Number of VCs in Round</i>	-0.203 [0.151]	-0.206 [0.150]	-0.202 [0.147]	-0.198 [0.150]	-0.199 [0.150]	-0.191 [0.148]
<i>Company Age</i>	-0.213 [0.307]	-0.284 [0.307]	-0.12 [0.312]	-0.26 [0.308]	-0.271 [0.308]	-0.184 [0.307]
<i>Total Round Amount (\$million)</i>	0.758** [0.300]	0.807*** [0.298]	0.733** [0.295]	0.767** [0.301]	0.875*** [0.309]	0.810*** [0.294]
<i>Serial Founder</i>	-0.774 [0.650]	-0.861 [0.646]	-0.962 [0.636]	-0.903 [0.648]	-0.909 [0.650]	-0.985 [0.641]
<i>Serial Successful Founder</i>	-0.806 [0.974]	-0.728 [0.966]	-0.65 [0.949]	-0.615 [0.972]	-0.633 [0.974]	-0.505 [0.960]
<i>VC Experience (Portfolio Size)</i>	0.282* [0.155]	0.286* [0.154]	0.212 [0.155]	0.259 [0.156]	0.270* [0.155]	0.218 [0.156]
<i>VC Partnership</i>	-0.194 [0.650]	-0.194 [0.644]	-0.183 [0.632]	-0.265 [0.647]	-0.208 [0.645]	-0.265 [0.636]
Observations	110	110	110	110	110	110
R-squared	0.27	0.29	0.33	0.30	0.30	0.33

Notes. See Table 1 for overview of sample. Sample is restricted to contracts that include a covenant that restricts debt issuances. OLS regressions where the dependent variable is $\log(1 + \text{Maximum Amount of Debt Company Can Incur Without Covenant})$. *Sum of Cash Flow Contingencies* adds together *Cumulative Dividends* (1 = present, 0 = not), *Participation* (1 = present, 0 = not), and *Automatic Conversion Enterprise Value* (1 = above median enterprise value if participation, 0 = below median enterprise value or no participation). All regressions control for industry (10 groups based on VentureEconomics classification), company location (California, Massachusetts, Texas and New York), year, and *VC and Company in Same State*. Constant is estimated but not reported. Standard errors are in brackets.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

inclusion of covenants and board seat allocation or cash flow contingencies.²⁰ It is very hard to identify a suitable instrument that correlates with board and cash flow contingency variables but not with the number of covenants. A geography-based instrument does not work, because both covenants and cash flow contingencies are affected by geographical factors (Bengtsson and Ravid 2010). For similar reasons, an instrument based on company or VC characteristics would not be convincing because a plausible argument could be made that such characteristics determine the structure of the whole VC contract, including the inclusion of covenants. Thus, I cannot rule out with formal econometric techniques the possibility that my results are affected by endogeneity.

²⁰ My interviews with lawyers and VC partners reveal that board control and cash flow contingencies are typically negotiated before covenants. This sequence is consistent with my causal argument.

It is possible that my results reflect some unobserved characteristic of the financing event. For example, some unobserved firm characteristics that might give a venture capitalist particular cause for concern about cheap exits can drive the venture capitalist to include in a contract both debt-like features and covenants designed to restrict the entrepreneur's ability to sell the company too cheaply. I am unable to rule out this possibility formally, but the results hold after controlling for key entrepreneur, company, and VC characteristics. In particular, my regressions control for the experience of the lead venture capitalist and the dollar amount raised in the financing round, both of which are likely to "soak up" unobserved dimensions of company quality.

6.2. Bargaining Power

One unobservable variable is that of the means by which the bargaining power in contract negotiation is distributed between VCs and an entrepreneur. At

first glance, it seems plausible that my results for the number of covenants in VC contracts could simply reflect situations in which the venture capitalist has greater bargaining power. This explanation is not likely for two reasons. First, VCs may use their bargaining power to negotiate a lower transaction price instead of insisting on more favorable contract terms. Indeed, Hsu (2004) and Bengtsson and Sensoy (2011) find evidence of this negotiation strategy using VC reputation as a proxy for VC bargaining power. VCs that are more reputable pay lower premoney valuations but attach fewer investor-friendly cash flow contingencies to their preferred stock. This behavior is optimal because VCs with stronger *ex ante* bargaining power are also likely to have better monitoring abilities and are therefore in lesser need of harsher contracts.

The second reason my results are unlikely to reflect differences in VC bargaining power is that this explanation implies a positive correlation between VC board control and number of covenants (because the venture capitalist would demand more of everything). This correlation is negative in my data. This finding suggests that VCs who were unable to negotiate a majority of board seats insisted on *stronger* covenant protection.

6.3. Contracting Styles

The correlations I derive in empirical testing could come from variation either *within* a particular venture capitalist's contracts or from variation *across* VCs. Even though the source of variation affects the exact interpretation of my results, it does not affect the overall conclusion of my analysis. If the patterns I document were to reflect within-VC variation, then this would be evidence that a particular venture capitalist demands stronger covenant protection for her contracts with features that are more debt-like. If, in contrast, the patterns were to reflect across-VC variation, then this would be evidence that each venture capitalist has a unique contracting style regarding covenants, board majority, and investor-friendly cash flow contingencies. These contractual dimensions would then be interrelated precisely according to the theoretical argument for including covenants. VCs with more debt-like contracts would also receive a greater number of covenants.

A related possibility is that my results reflect differences in contracting style that vary with the lawyers who advise parties to the contract negotiations. Again, my overall conclusion would remain the same even if the patterns I document were to reflect primarily differences in contracting styles across law firms. The contract templates would be structured according to theoretical arguments for interrelating various contractual dimensions in particular ways.

Law firms that negotiate debt-like contracts could also cede a greater number of covenants to VCs.

To investigate the source of such variation I run untabulated regressions that include fixed effects for each VC firm. I find that the number of covenants is lower (but not significantly so) if the venture capitalist has a board majority and higher if the venture capitalist is entitled to greater fixed payoffs (measured by *Sum of Cash Flow Contingencies*). I also run untabulated regressions that include law firm effects. The number of covenants is smaller if a contract gives a venture capitalist a majority of the board seats (not statistically significant) or smaller fixed payoffs (statistically significant). These mixed results suggest that my findings are unlikely to be completely driven by cross-firm variation in VC or law firm contracting styles. It should be noted that the estimation technique has weak statistical power because of small sample size and a large number of unique VCs and law firms that are used as fixed effects.

7. Conclusion

This paper studies the economic role of covenants in contracts between entrepreneurial companies and their VC investors. Much like covenants that are attached to bank loans and bonds, covenants in VC contracts are in place to circumvent an entrepreneur's ability to engage in claim dilution, asset substitution, or overinvestment. I exploit variation in the debt-likeness of VC contracts to validate the prevailing theoretical explanation of why a financier receives covenants (Jensen and Meckling 1976, Myers 1977, Smith and Warner 1979). I show that a greater number of covenants are included in more debt-like VC contracts than in more equity-like contracts. My overall finding of this paper is that VCs employ complex, tailor-made contracts to overcome agency problems. This result is not new, as it has been found in earlier studies (Sahlman 1990; Gompers 1998; Kaplan and Strömberg 2003, 2004; Cumming 2008). The novelty of this paper is its examination of the economic role of one particular component of these contracts—covenants. I thereby add to the literature on VC contracts by conducting the first comprehensive investigation of covenants in this setting. I show that covenants play an economic role in VC investments even though VCs are shareholders with access to other powerful governance mechanisms. This conclusion is motivated by my findings that (i) almost all VC contracts include covenants, (ii) such inclusion is sensitive to conflicts of interests between VCs and entrepreneurs, and (iii) even VCs who hold board seat majorities receive some covenant protection.

A caveat that applies to my analysis is that I can draw no inference regarding the optimality of

the observed empirical pattern of covenants. My results can be explained by VCs' receiving contractual protections that mitigate conflicts of interest with entrepreneurs. Perhaps this protection is too generous in the sense that it allows VCs to make a greater number of self-serving decisions that expropriate the entrepreneur than they would be able to without such covenants. Whether covenants and other control rights are optimally allocated in VC contracts is a question worthy of further study.

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