











would be infeasible in the VC setting since startup companies have unreliable and highly volatile accounting numbers. Every covenant that I observe in my sample of VC contracts takes the form of a protective provision that gives the VC the right to veto a financial or an operational decision. As for specific covenant types, VCs often receive the right to block issuance of debt and equity. Covenants on selling and buying assets are also frequently included, whereas covenants on capital expenditure and other investments are less prevalent. VCs often have the right to block the entrepreneur from changing the company's business model but this restriction appears to be a substitute for a covenant that prohibit other changes to a company's competitive ability.

The above discussion leads me to conclude that there are important similarities between VC investments and debt financings of mature companies with regards both to the type of agency problems and to the contractual solutions employed to overcome such problems. Based on this observation I propose that covenants should, at least partly, be included in VC contracts for the same economic reasons as covenants used in bank loans and bonds. This rationale justifies my conclusion that the cross-sectional differences in covenant protection that I document are supportive evidence of Smith and Warner's logic.

In addition to offering a useful and unexplored testing ground for theories about covenants, VC contracts are interesting to study in their own right, given the real-world importance of venture-backed companies. Between 1999 and 2008 VCs infused about \$360 billion in 42,000 U.S. deals. Many of these investments were instrumental in fuelling entrepreneurial activity, innovation and economic growth.<sup>4</sup> Relatively little is known about the contractual terms which surround these investments because of the data limitations which bedevil private firms. This paper adds specifically to a small but growing literature on VC contracts (Sahlman, 1990; Kaplan & Strömberg, 2003, 2004; Bengtsson & Sensoy, 2009; Bengtsson & Ravid, 2009; Broughman & Fried, 2009). Although other aspects of VC contracts have been explored in previous studies, I am the first to present a comprehensive analysis of the covenants.<sup>5</sup>

<sup>4</sup> Statistics are from National Venture Capital Association.

<sup>5</sup> My work builds on papers that relate control rights in VC contracts to company and industry characteristics (Gompers, 1998), company evolution (Bienz & Walz, 2006) and outcomes (Cumming, 2008). My work is also related to studies of covenants in investment contracts between General and Limited Partners in VC funds (Gompers & Lerner, 1996; Cumming & Johan, 2006).

My investigation has an important advantage over existing VC contract studies that focus on residual control rights and cash flow rights. In addition to being able to analyze the degree of overall contractual protection, I can present actual statistics on which decisions inside a startup are surrounded with the largest conflict of interest between VC and entrepreneur. These statistics can readily be calculated because each negative covenant explicitly covers a specific decision. To illustrate, my data reveals that VCs have the right to veto changes to the company's business plan three times more often than changes to the management team. Such difference suggests that turnover of human capital, which as documented by Hellman and Puri (2002) and Kaplan, Strömberg and Sensoy (2009) occurs relatively often, may be associated with less pronounced tensions than alterations to the company's operations and strategy.

The remainder of this paper is organized as follows. Section II presents my data on VC contracts, and Section III describes how the structure of VC investments can engender conflicts of interest between VCs and an associated entrepreneur. In section IV I analyze the various covenants and report on frequency of use. Section V contains the empirical analysis which shows that the inclusion of covenants correlates with the allocation of board rights and the inclusion of investor-friendly cash flow contingencies. Section VI discusses the results pertaining to the voting rules for covenants, and the paper ends with a concluding discussion that summarizes the implications of the findings.

## **II. Description of the Sample: VC Contracts**

### ***A. Sample Construction***

My sample of VC contracts is collected, with the help of the Private Equity data provider *VCExperts*, from legal filings (Certificates of Incorporation) that venture-backed companies are required to file with their states of incorporation.<sup>6</sup> The contracts studied in this paper represent a subsample of the 1,800 contracts between U.S. venture-backed companies and U.S. VCs analyzed in Bengtsson and Ravid (2009). Although cost considerations prevent this dataset from covering all U.S. VC investments, it is a large sample that is representative with respect to key entrepreneur, company, and VC characteristics.

From this sample of 1,800 contracts, I identify all contracts from first-round VC financings (about one quarter of all observations). I study first-round contracts because the

<sup>6</sup> I appreciate the help of Joseph Bartlett, Cory Buecker, and Justin Byers in this process.

complex nature of contracts from follow-up financings makes it very difficult to analyze the specific control rights that are associated with covenants – each financing round issues a new class of preferred equity with a unique list of covenants and other contract terms. It is difficult to disentangle VC rights to block particular decisions because such veto rights may require the approval of holders of many classes of preferred stock. Because VCs from earlier rounds often invest in follow-up rounds, these investors can enjoy many different mechanisms by which to veto a decision.

My focus on first-round financings could also be motivated on theoretical grounds. The severity of the moral hazard problem pertaining to the entrepreneur’s decisions is likely to decline as VCs in follow-up rounds demand more board seats and shareholder votes in exchange for their new financing. It is therefore plausible that the economic role of covenants in VC contracts is most pronounced for first-round investments.

I further limit my study to contracts for which the Certificate of Incorporation includes complete documentation of the allocation of cash flow contingencies, covenants and board seats. Although the legal documents that 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 only mentioned in 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. Importantly, this sample restriction is unlikely to bias my results—when the total number of board seats is mentioned, this merely reflects a lawyer’s choice of information to add to mandatory legal filings.

My final sample includes contracts from 182 companies. This sample size is comparable to those used by other notable recent VC studies such as Hellman and Puri (2002), Kaplan and Strömberg (2003), Hsu (2004), Cumming (2008), and Broughman and Fried (2009). Most contracts in my sample stem from financing rounds conducted in 2006 and 2007, and no contracts are from 2008 or after. Given the scarcity of evidence on covenants in VC contracts from other periods it is difficult to know whether the empirical patterns that I observe are unique to the sample period. The “easy credit” period of 2002-2007 involved relatively borrower-friendly covenant packages for bank loan and bonds (Murfin, 2010). Assuming that this laxness carried over to the VC setting then my results are likely to understate, or at least not overstate, the real-world importance of covenants in VC contracts.

## ***B. Summary Statistics***

I merge each contract with its corresponding round in *VentureEconomics*, one of the largest and most complete databases on U.S. VC investments, and supplement with hand-coded information on founder characteristics. Table 1 presents the summary statistics. The sample is recent, with 86 percent of all financing rounds being closed in 2006 or 2007. 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 one in five companies has a founder who has previously started a venture-backed company, while fewer than one in ten companies has a founder whose previous venture-backed company either went public or was acquired. The average round amount is \$7 million and the post-money valuation, which is a negotiated term that determines the equity ownership stake that VCs receive in exchange for their investment, is \$20 million.

A majority of the financing rounds (77%) are raised from more than one VC. For such syndicated rounds I define the lead VC as the VC who provides the greatest amount of capital.<sup>7</sup> I note that most lead VCs (86%) are organized as independent private partnerships. At the time of financing, the lead VC had in total invested in 96 unique companies, of which about one in ten was exited via an Initial Public Offering.<sup>8</sup>

## **III. 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 VCs and an associated entrepreneur (Sahlman, 1990; Kaplan and Strömberg, 2003). Although this paper focuses on covenants, the economic role of covenants cannot be analyzed unless these veto rights are examined in the context of other contract terms. For the purposes of my study, it is also essential

<sup>7</sup> In rounds where two or more VCs invest the same amount, I define the oldest VC firm as the lead VC. The results are unchanged if I use other reasonable identifications of the lead VC (e.g., investment experience, success rate)

<sup>8</sup> The distribution of 'VC Experience' is highly right-skewed because a small number of old VC firms have each invested in over 500 unique companies. The sample median for 'VC Experience' is 43 companies.

to understand the key control rights and cash flow contingencies since they are the building blocks of the contract's overall basic design, the variation of which I exploit in section V to test what determines the inclusion of covenants.

### ***A. Common Stock and Preferred Stock***

Venture-backed companies have 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 enjoys a sizeable common stock holding in the form of vested shares, unvested shares, options, and warrants.<sup>9</sup> VCs almost exclusively hold preferred stock which, like common stock, gives investors fractional company ownership but also additional control rights and cash flow contingencies. As reported in table 2, VCs hold on average 29 percent of the outstanding stock for the financing rounds represented in my sample.

### ***B. Investor-Friendly Cash Flow Contingencies and Fixed Payoffs to VCs***

#### ***B.1 Cumulative Dividends***

When a venture-backed company is sold or otherwise exited, VCs have the contractual right to claim fixed payoffs to their preferred equity which are senior to payoffs to common equity. These (debt-like) payoffs come from two investor-friendly cash flow contingencies: liquidation preference, which is expressed as a multiple (1X, 2X, etc.) of the initial investment, and cumulative dividends, which are expressed as 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.<sup>10</sup> As reported in table 1, the variation in cumulative dividends is pronounced, with 46 percent of the contracts providing such dividends. Cumulative dividends are incurred annually but are not paid out until the company is sold or otherwise exited. The average dividend rate in my sample is 7.4 percent.

<sup>9</sup> For companies that have raised the first VC round, the average equity ownership is about 9% for non-founder CEOs and 12% for founder CEOs of U.S. venture-backed companies (Bengtsson & Hand, 2009).

<sup>10</sup> In untabulated tests, I include the liquidation preference multiple in the "Cumulative Dividends" variable (1 if liquidation preference above 1X or cumulative dividends present, and 0 otherwise) and obtain qualitatively similar results.

### B.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 VCs are able to “double-dip” by receiving both their fixed payoffs (from liquidation preferences and cumulative dividends) and a payoff from their fractional company ownership. With convertible preferred stock the VC must choose at the time of the sale of the company between a fixed payoff and a fractional ownership payoff. Thus, for a range of relevant exit values, VCs receive fixed payoffs only if their preferred stock includes a participation right. In some contracts in my sample, the participation is capped, which means that VCs receive the payoff from liquidation preferences (and sometimes cumulative dividends) only if the IRR is below a predetermined hurdle. As reported in table 1, about 70 percent of the contracts in my sample involve participating preferred stock and 30 percent convertible preferred stock.<sup>11</sup>

### B.3. Automatic Conversion Amount

The fixed payoff component of VCs’ preferred stock is also directly related to the contractual term “Automatic Conversion Provision,” which specifies that all cash flow contingencies that give VCs liquidation preferences and cumulative dividends will be annulled if a company raises more than a certain amount of capital in an Initial Public Offering. While including such an “Automatic Conversion Provision” is boilerplate in VC contracts, the minimum amount needed for such conversion varies among contracts. The higher this figure, the wider the range of selling prices at which VCs receive fixed payoffs from cumulative dividends and liquidation preferences. Put differently, a higher automatic conversion amount implies that company has to be more successful in order to eliminate differences between preferred stock and common stock. The average automatic conversion amount is \$28 million in my sample.

### ***C. The Agency Problem Associated with Fixed Payoffs to VCs***

<sup>11</sup> In untabulated robustness tests I have created a trinary variable that captures whether the VCs’ preferred stock was (i) participating without a cap, (ii) participating with a cap or (iii) convertible. The empirical results presented in section VI are robust when analyzing this trinary variable instead of the binary variable that does not account for the presence of a participation cap.

As discussed above, the size of the VC's fixed payoffs for a given company outcome is jointly determined by liquidation preference, cumulative dividends, participation rights and automatic conversion amount. This entitlement to a fixed payoff means that a VC's preferred stock consists of both a debt-like component and an equity-like component (through the VC's fractional company ownership). Because the entrepreneur holds common stock, which has an equity-like component only, the payoffs to the entrepreneur and the associated VC diverge for many outcomes. While the payoff to every shareholder in a venture-backed company is designed to be non-decreasing with the company's exit value, entrepreneurs have relatively more to gain from successful outcomes. Since the liquidation preference and cumulative dividends are fixed dollar amounts, they represent a relatively low fraction of higher IPO or sale proceeds. Also, the VC's fixed payoffs disappear entirely if the company has an IPO with proceeds above the automatic conversion amount.

The divergence in payoffs for different company outcomes gives the entrepreneur a monetary incentive to pursue strategies which increase the volatility of the exit value. The entrepreneur's role as CEO, and often also company founder, gives him ample opportunities to make decisions that could lead to overinvestment or substitution from less risky assets to more risky assets. For example, the entrepreneur may try to develop a new product which has very uncertain functionality and applicability. The entrepreneur may also deviate from the company's business plan by rapidly entering new markets and hiring new employees. Furthermore, the entrepreneur could sell the company's existing patents and acquire the right to use more uncertain technologies. These strategies could be financed by additional rounds of VC financing, which would dilute the existing VCs' ownership, or by bank loans and venture debt, which would change seniority of the existing VCs' fixed payoffs.

It is important to note that an entrepreneur may have many reasons for pursuing strategies that lead to overinvestment, asset substitution or claim dilution. It is possible that the entrepreneur believes he is making the right choices because he is overoptimistic about his own decision-making ability. Puri and Robinson (2007) show that self-employed individuals are more optimistic than wage earners. It is also possible that the entrepreneur expects to get private benefits, such as career opportunities and social prestige, from running a more successful company. The presence of such benefits may also motivate the entrepreneur to make decisions which increase the volatility of the company's exit value. The need for VC control over

important decisions is therefore not only the result of the VC's contractual right to fixed payoffs. However, as shown by Jensen and Meckling (1976) and Myers (1977), an investor who is entitled to larger fixed senior payoffs will definitively exhibit a greater demand for control over specific decisions. The VC can obtain the right to influence decisions in two ways: covenants, which are introduced in section IV, and board seats.<sup>12</sup>

#### ***D. Allocation of Board Seats***

Influence over the decisions made by boards of directors is commonly viewed as one of the most central governance mechanisms in VC investments (Lerner, 1995; Kaplan & Stromberg, 2003; Baker & Gompers, 2003; Fried & Ganor, 2006; Hochberg, 2008; Wongsungwai, 2009). Summary statistics on board seat allocation for my sample of VC contracts is reported in table 1. In all sample companies, at least one board seat is held by a VC who invested in the round. On average, VCs hold 2.1 board seats, common shareholders 1.7 board seats, while 1.4 board seats are given to “outsiders” who are individuals elected jointly by common shareholders and VCs.

Although my sample represents numerous distinct board compositions, each board of directors falls into one of three categories based on the degree of VC control. The first category, which I denote as “VC Board Majority” includes the 18 percent 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 percent 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 46 percent 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.<sup>13</sup>

<sup>12</sup> VC contracts include provisions that give VCs additional exit rights. Notable examples include the right to sell back their shares to a company (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 Certificates of Incorporations that are the basis of my sample.

<sup>13</sup> 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 relatively low correlations duplicate the findings of Kaplan & Strömberg (2003) that the allocation of board rights is frequently decoupled from equity ownership in venture-backed companies.

#### ***D. The Economic Role of Covenants***

As demonstrated in my sample, VCs often do not have the necessary majority of the board seats that would allow them to singlehandedly make (or block) an operational or financial decision. As a substitute to board control, VCs would have to rely on selectively negative covenants that confer on them the right to veto certain operational and financial decisions. VCs may need covenant protection even in the cases where they have a board majority because there are fiduciary duty limitations on the exercise of board power. Board members are prohibited by law to make decisions that favor one class of shareholders at the expense of another class.<sup>14</sup> Because there are no such legal limitations on decisions made by investors in their role as shareholders, VCs can avoid the threat of lawsuits by outlining in the contract which decisions will require VC approval. For these reasons it is reasonable to expect that covenants could play an important economic role for in VC contracts. This expectation is supported in my overview analysis of covenants, which is presented in the section IV.

Moreover, if the argument of Smith and Warner (1979) were to apply to venture-backed companies then covenants should be used by VCs to mitigate the scope for overinvestment, asset substitution and claim dilution. In particular, VC contracts should include stronger covenant protections when VCs are entitled to greater fixed payoffs but have no control over the board of directors. As discussed in section V, my cross-sectional analysis finds strong support for this expectation.

#### **IV. Overview of Covenants in VC Contracts**

I here describe the details of how covenants included in VC contracts work and what economic role they play. Such lengthy description is necessary since one goal of this paper is to present the first in-depth study of these covenants. However, readers who are already familiar with covenants in VC contracts could skip this section and turn directly to the empirical analysis of section V.

##### ***A. The Exclusive Use of Negative Covenants***

<sup>14</sup> Fried & Ganor (2006) present evidence that in some recent cases the fiduciary duty requirement of 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 due to the fear of future litigation.

Contracts involving bank loans or bonds typically include various financial covenants, according to which the company has to maintain a certain net worth, working capital, interest coverage or 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 make the relevant account numbers volatile, uninformative and easy for the entrepreneur to manipulate. My sample includes only negative covenants or protective provisions that specify explicitly over which decisions preferred shareholders (VCs) have veto rights. Because contractual language often includes imprecise terms and phrasing (e.g., “material assets,” “unless in the ordinary course of business,” “key employee”), such restrictions may be difficult to enforce in a court of law, but they nevertheless offer VCs some leverage with an entrepreneur with respect to contractual compliance and firm governance.

The covenants give VCs the right to block a decision conditionally on such investors (i) retaining the number of the preferred shares required to cast a covenant vote and (ii) having a sufficient voting majority for the covenant vote to apply. I discuss the structure of these voting rules in section VI.

### ***B. 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 percent 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 or director agreement or issuing dividends to common shareholders. Consistent with Berglof (1994), there are also boilerplate covenants requiring preferred shareholder approval of liquidations, acquisitions, and mergers.<sup>15</sup> On the whole, the boilerplate covenants play an important economic role by providing basic

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

safeguards to VC's preferred stock, and by limiting the entrepreneur's ability to raise new financing rounds and make cash disbursements.

### *C. Covenants Included Selectively*

I turn now to covenants that are included selectively, which are the focal point of my analysis. I identify a total of 12 types of functionally different covenants. As reported in figure 1, all but 8 percent 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 percent of the sample includes 5 or more covenants. The correlation matrix for the covenants, presented in table 3, has almost exclusively positive elements, a high fraction 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 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.

#### *C.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 V.F analyzes the determinants of the maximum debt amount. About one in ten contracts a debt covenants prohibit any debt issuance. As reported in table 3, such covenants correlate positively with the inclusion of other covenants.

VCS may also want to restrict an entrepreneur from issuing equity to avoid diluting the VCs' ownership stake. While 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 percent of all contracts include covenants that grant veto rights to VCs with respect to either junior preferred

stock or common stock. As presented in the cross-correlation matrix in table 3, such covenants are included independently of others.

### C.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 line 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 commonplace (41% of contracts). About one in four contracts (27%) include covenants that I designate as "Change Business," which prohibit an entrepreneur from entering, changing, or exiting a line of business. A less common type of covenant (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 Linsey (2008) and Ozmel, Robinson, and Stuart (2007), strategic alliances are commonplace among venture-backed companies and can affect outcomes. Such "Change Business" and "Change Competitive Ability" covenants appear to be used as substitutes in practice—the cross-correlation between these two restrictions, reported in table 4, is zero.

An entrepreneur can also increase the probability of a successful company outcome through aggressive investments, so about one in ten contracts (8%) limit 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.

### C.3. Covenants Related to Employee Matters

About 10 percent of my sample contracts include covenants according to which a company cannot hire a new CEO or a senior manager without preferred shareholder approval. Such a veto right matters because human capital is such a critical aspect of venture-backed companies. This relatively low prevalence of a hiring covenant stands in contrast to Hellman

(1998) who argues that “probably the most contentious issue [in a venture-backed company] is the composition of top management”. Another type of employee-related covenant restricts major changes to the cash and equity compensation of CEOs and senior managers and in some cases also to lower-level employees. While restrictions related to stock option plans are included in a quarter of all contracts, changes to employee cash compensation are restricted in only one in 20 contracts. About one in five (19%) of the sample contracts also prevent an entrepreneur or a company employee from borrowing money from or in other ways entering into a financial transaction with the company.<sup>16</sup>

#### C.4. Other Covenants

One in twenty (5%) of the sample VC contracts include 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 without VC approval, which can prove important when an entrepreneur wants to switch to an auditor who is less meticulous and provides greater leeway in business decisions and financial reporting. A second monitoring restriction prevents a company from relocating its headquarters, which the entrepreneur may want to do for lifestyle reasons or to reduce VC influence over business decisions.

Finally, 4 percent of the sample contracts restrict entrepreneurs from hiring investment bankers or undertaking IPOs without VC approval. Although VCs would typically have no objections to their portfolio companies going public, they prefer to sell a successful company to a strategic buyer for a similar valuation. “Automatic Conversion Provisions” in VC contracts 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 are significantly less prevalent, entrepreneurs may prefer an IPO over an acquisition (Hellman, 2006; Cumming, 2009).

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

## **V. Determinants of Covenants in VC Contracts**

### ***A. Aggregation of Covenant Protection***

Having established the prevalence of covenants in VC contracts, 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. Although I conduct robustness tests where I study the inclusion of each individual covenant, my main unit of analysis is the aggregate covenant protection of the VC contract. I measure this aggregate protection by a simple number count of selective covenants. This aggregation method implicitly assumes that the importance of each covenant is the same, an assumption that is clearly a simplification because the importance of each covenant is likely to depend on the specifics of each financing situation, including characteristics of the involved VC and entrepreneur. Lacking information about such specifics I am unable to estimate the relative importance of different covenants in a given contract, which leads me to instead rely on the most transparent aggregation method. As discussed in section V.E, the pattern that I document for the number of covenants also holds for most individual covenants. This means that my results would remain qualitatively the same if I used other reasonable aggregation methods.

### ***B. Univariate Results***

Table 4 reports the number of covenants for subsamples formed based on the basic design of the VC contract. Panel E shows compare VC contracts which include no investor-friendly cash flow contingency with contracts which include all of cumulative dividends, participation rights, and above median automatic conversion amount. I find that contracts which have the most debt-like features (“No VC Board Majority” and “All Cash Flow Contingencies”) include 3.9 covenants on average. This is about five times more than the average number of covenants for contracts with the most equity-like features (“VC Board Majority” and “No Cash Flow Contingencies”).

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 at least one board member appointed by the common shareholders to side 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 given to investors who have weaker residual control rights. I also note that covenants are still relatively common in contracts that give VCs complete control over board decisions.

In panels B, C and D I consider how the inclusion of covenants varies with each of the three cash flow contingencies that I study in this paper. Contracts that give VCs the right to receive cumulative dividends include 0.8 more covenants than contracts that give no cumulative dividends to VCs. This difference is significant at the 5% level. Similarly, contracts that give VC participation rights include 0.9 more covenants and contracts with “Automatic Conversion Amount Above Median” have 0.9 more covenants than other (median or below median) contracts. Both of these differences are significant at the 1-percent level.

On the whole, my univariate results present strong evidence in favor for the argument of Smith and Warner that investors receive stronger covenant protections when their financial contract includes greater fixed payoffs but no residual control rights.

## ***B. Multivariate Results***

### ***B.1. Regression Setup***

In order to confirm the above-discussed results after controlling for other factors, 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 and 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 *VentureEconomics* 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 the round, the lead VC’s experience (proxied by historical number of portfolio companies) and a dummy that takes the value 1 if the lead VC was organized as a private partnership and 0 otherwise.<sup>17</sup>

<sup>17</sup> 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.

I further control for geographical factors by including dummies for company location (California, Massachusetts, Texas, and New York). Bengtsson and Ravid (2009) show that contracts in California include fewer investor-friendly control rights and cash flow contingencies. I also include a dummy “VC and Company in Same State” that takes the value 1 if the lead VC 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 (2009) indicate that the balance of power between VCs and associated entrepreneurs differs for companies incorporated in Delaware than for companies incorporated in other U.S. states. I observe no direct association between the number of covenants and the state of incorporation, and find that controlling for the latter does not qualitatively change any of the reported coefficients.

### B.2. Board Majority

I present regression results in table 5A. Model 1 includes only control variables. The relationship between covenants and VC board majority is established in model 2. In models 3, 4 and 5 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 & Ganor, 2009), VCs do not count on the full support of outside board members when negotiating covenants.

### B.3. Cash Flow Contingencies

Model 5 includes a dummy for “Cumulative Dividends” that is positive and statistically significant in a 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 (models 6 and 7). Similarly, model 8 includes “Automatic Conversion Amount Above Median” and confirms the univariate finding that this cash flow contingency is positively correlated with the number of covenants.<sup>18</sup> Aside from the coefficient on cumulative dividends,

<sup>18</sup> In untabulated tests I obtain qualitatively similar results if I replace “Cumulative Dividends” with the annual

the results from 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.

#### B.4. Number of VCs in Round

The multivariate regressions also show that the number of covenants is lower when a greater number of VCs invest in the 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. This result may be because the more investors there are in the round the weaker is the incentive of each VC to monitor an entrepreneur's actions (Rajan & Winton, 1995). Having more VCs may also introduce "haggling" costs, reducing the effectiveness of exercising veto rights. These explanations rely on the argument that covenants are in place primarily to regulate interactions between VCs and an entrepreneur and not interactions among VCs. Evidence supporting this argument is that even contracts for unsyndicated financing rounds, in which there are no interactions among VCs, include 3.2 covenants on average.

#### B.5. Company Age

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 as compared with younger companies. Kaplan and Strömberg (2003) and Bengtsson and Sensoy (2009) note a similar empirical association between company age and the number of investor-friendly cash flow rights in a venture capital contract. One plausible 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.

### **C. Endogeneity**

#### C.1. Difficulty to Find Instrument

dividend rate and Automatic Conversion Amount Above Median" with the actual dollar amount required for automatic conversion.

The results from the univariate comparisons and regressions strongly suggest that the inclusion of covenants is related to 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 inclusion of covenants and board seat allocation or cash flow contingencies. 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 since both covenants and cash flow contingencies are affected by geographical factors (Bengtsson & Ravid, 2009). For similar reasons, an instrument based on company or VC characteristics would not be convincing since a plausible argument could be made that such characteristics determine the structure of the whole VC contract, including the inclusion of covenants.

### C.2. Causality

Fortunately, understanding exactly how covenants and other contract variables are causally related is not critical to the interpretation of my results. VCs and entrepreneurs may first decide on board control and cash flow contingencies and thereafter adjust the number of covenants to mitigate ensuing agency problems. My interviews with lawyers and VC partners suggest that such a “sequence” is very common since most covenants are typically negotiated after other contract terms have been decided. It is possible, however, that covenants are decided on first, and then board control and debt-like payoffs are negotiated to address any remaining agency problems after accounting for the covenants. Either “sequence” or form of causality is consistent with my conclusion that the allocation of specific decision rights in VC investments is related to but not necessarily causally determined by the basic design of the financial contract.

### C.3. Unobserved Variables

My results might also reflect some unobserved characteristic of the financing round. Although I am unable to formally rule out this possibility, the results hold after controlling for entrepreneur, company, and VC characteristics. In particular, my regressions control for the experience of the lead VC and the dollar amount raised in the financing round, both of which variables are likely to “soak up” unobserved dimensions of company quality. Moreover, with the exception of company age and number of VCs in the round, I observe no significant relationship

between any of the control variables (including company industry) and the number of covenants. The absence of significant correlations with observed characteristics is indicative (but clearly not conclusive) evidence against the possibility that correlations with unobserved characteristics are of sufficient magnitude to explain the association between covenants and contract design.

#### C.4. VC Bargaining Power

One unobservable variable is how the bargaining power in the contract negotiation is distributed between the VCs and the entrepreneur. At first glance, it seems plausible that my results on the number of covenants in VC contracts could simply reflect situations where the VC has more bargaining power. This explanation is not likely for two reasons.

The first reason is that 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 (2009) document this pattern using VC reputation as a proxy for the VC's bargaining power. More reputable VCs pay lower pre-money valuations but attach fewer investor-friendly cash flow contingencies to their preferred equity. This behavior is optimal because VCs with stronger ex-ante bargaining power is also likely to have stronger ex-post bargaining power, and are therefore in less need of harsher contracts.

The second reason for why my results are unlikely to reflect differences in VC bargaining power is that this explanation would predict a positive correlation between VC board control and number of covenants (because the VC would demand more of everything). The fact that this correlation is negative in my data indicates that VCs who have not been able to get a majority of the board seats, perhaps because of weak bargaining power, insists on stronger covenant protection.

#### C.5. Contracting Style of VC

The correlations I derive in the empirical testing could come from variation either *within* a particular VC's contracts or from variation *across* different 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 is evidence that a particular VC demands stronger covenant protection for her contracts with more debt-like features. If, on the other hand, the patterns were to reflect across-VC variation then this is

evidence that each VC has its own contracting style with regards to covenants, board majority and investor-friendly cash flow contingencies. These contractual dimensions are not random but interrelated according to the logic of Smith and Warner. Thus, the nature of the contracting styles that VCs (as a group) employ would be such that there is stronger covenant protection when other contractual features enhance the demand for such protection.

To investigate the source of variation I run regressions that include fixed effects for each VC firm. The problem is that this estimation technique has weak statistical power because of a small sample size and a limited number of observations per unique VC. Appendix table A specifications 1-3, present these fixed effect regressions that include 79 observations and 34 fixed effects. The number of covenants is smaller, but not significantly so, if the VC has a board majority and greater if the VC is entitled to greater fixed payoffs (measured by “Sum of Cash Flow Contingencies”). In other words, a particular VC negotiates a greater number of covenants when her contract has more debt-like features.

#### C.6. Contracting Style of Law Firm

Another possibility is that the patterns I document reflect differences in contracting style of the law firms who advice in the contract negotiations. Bengtsson (2009) shows that VC contracts include fewer investor-friendly cash flow contingencies when entrepreneurs are represented by more skilled legal advisors. Again, even if the patterns I document were to primarily reflect differences in contracting styles across law firms then this would not alter my overall conclusion. As predicted by Smith and Warner’s logic, the nature of the contracting styles that law firms (as a group) employ would be such that there is stronger covenant protection when other contractual features enhance the VC’s demand for such protection.

To investigate whether my results only reflect contracting styles of law firms I run regressions with fixed effects for each law firm in my sample. Data on law firm identities are collected from *VentureEconomics* and *VCExperts*, and are available only for 82 observations. These regressions have weak statistical power because the sample size is small and the number of observations per unique law firm is limited. Appendix table A specifications 4-6 validates the result that the number of covenants is greater when the VC contracts has more debt-like control (not statistically significant) and cash flow features (statistically significant).

#### *D. Subsample Analysis*

I next conduct a multivariate regression analysis for various subsamples formed on VC and company characteristics that previous empirical studies have shown to be linked to the structure of VC contracts. By running subsample regressions I econometrically account for the possibility that the full sample analysis is affected by non-linear relationships for explanatory variables. Although each subsample is small (fewer than 100), this investigation sheds some light on the generality of my findings. Results are presented in table 5B.

In regression models 1 and 2 I divide the sample based on the experience of the lead VC. Although the coefficients on cash flow contingencies are positive for both experienced and inexperienced VCs, the coefficient on VC board control is more negative for inexperienced VCs. As presented in models 3 and 4, the coefficient on VC board control is also more negative when the company and VC are located in different U.S. states. Previous research has shown that influence over the board of directors is more prevalent for experienced VCs (Wonsungwai, 2009) and for VCs that are located geographically closer to their portfolio companies (Lerner, 1995). My results indicate that these VC characteristics also influence the extent to which VC board control and covenants serve as substitutes in practice.

In models 5 and 6 I sort the sample based on the age of the company at the time of the financing round. The coefficient on VC board control is similar across these subsamples, but the coefficients on cash flow contingencies are higher for older companies. This finding is consistent with my earlier argument that the inclusion of covenants is more important for older companies because the presence of tangible assets amplifies problems pertaining to claim dilution, asset substitution, and overinvestment. In models 7 and 8 I split the sample based on the dollar amount invested in the round. Whereas the finding that the number of covenants increases with company age is more pronounced for smaller financing investment rounds, the results on VC board control and investor-friendly cash flow contingencies are more pronounced for larger financing rounds. Given that the value of a company's intangible assets is likely to increase with the dollar amount raised from VCs, a larger financing round has greater scope for conflicts of interest between VCs and an entrepreneur.

In the last subsample analysis I split the sample based on whether the company was headquartered in California (model 9) or in another U.S. state (model 10). I find that the relevant coefficients are more pronounced for companies located outside California. Although the sample

of California companies is too small (54 companies) to allow for a proper comparison, this result suggests that covenants are not only less common for California companies but also less related to the allocation of board control or cash flow contingencies.

### ***E. Individual Covenants***

The next step in my analysis is to study the determinants of each of the 12 selectively included covenants. The primary purpose of this study is to examine whether my results on the number of covenants apply to only a few covenants or reflect a broader pattern that applies to most. Table 6 presents univariate comparisons of the frequency of each individual covenant based on subsamples formed on VC board control and investor-friendly cash flow contingencies, respectively.

The frequency for 11 out of the 12 covenants is lower when VCs occupy a majority of board seats. When a contract has an above-median “Automatic Conversion” amount the frequency is higher for all covenants except “Issue Junior Security” and “Monitoring.” When a contract gives VCs participating preferred stock the frequency is higher for all covenants except “Change Compensation” and “Inside Transaction.” The result on cumulative dividends is somewhat more mixed, as 8 out of 12 covenants are more likely to be included when VCs are allowed to receive cumulative dividends.<sup>19</sup> Although most of these univariate differences are not statistically significant, the number of significant results is too large to be generated by mere chance. I conclude that my findings pertaining to the 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 robust to other aggregation methods than a simple count.

### ***F. Tightness of Debt Covenant***

As discussed in section IV, covenants included in VC contracts are restrictive in the sense that they outline decisions over which VCs have veto rights. Thus, unlike financial covenants, which specify the ratios a company must maintain, most covenants are binary in the sense that they either give the VC the right to block a decision, or not. Only two types of covenants specify

<sup>19</sup> Appendix table B presents regressions with dummies capturing the inclusion of each individual covenant as the dependent variables (the estimation method is logit). The regression results are qualitatively similar to the results of the univariate comparisons.

a range for VC veto rights: “Investment” and “Issue Debt” covenants. Because only 13 of the sample contracts 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 7, I restrict the sample to contracts that include the “Issue Debt” covenant and run multivariate 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. Such a covenant is also set tighter, although not significantly so, if the contract has a higher automatic conversion amount or if VCs have participating preferred stock. I also note in table 7 that the maximum amount of a debt covenant is higher for larger financing rounds. On the whole, the analysis of the debt covenant provides evidence consistent with the argument that covenant protection is set tighter when the basic contract design is such that conflicts of interests are amplified.

## **VI. Voting Rules for Covenants in VC Contracts**

One goal of this paper is to present a complete analysis of covenants included in VC contracts. For this purpose I investigate in this section how voting rules for covenants are outlined. These voting rules are an important part of the protection given to VCs because they determine how and when these investors can use covenants to veto entrepreneurial decisions.

### ***A. Fraction of Issued Shares Required for Covenant Vote***

VCs must keep a predetermined number of the preferred shares issued in the financing round to have the right to cast a covenant vote. Put differently, VCs can lose the right to cast a covenant vote if they sell or otherwise dispose of a certain number of their preferred shares. Fraction 2 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 percent 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. Table 8 models 1-3 present the results of tobit regression, where the dependent variable is the minimum predetermined fraction of the preferred shares issued in the financing round that VCs collectively must keep to cast a covenant vote. The fraction is

lower for contracts with more investor-friendly cash flow contingencies but significantly so only when VCs hold participating preferred stock. I interpret this finding as (weak) support of the argument that protections secured by covenants are more pronounced for contracts that entitle VCs to higher fixed (debt-like) payoffs. I also find that the fraction required for a covenant vote is lower for older companies, for less experienced lead VCs, and when the lead VC and company are located in the same U.S. state.

### ***B. Fraction of Outstanding Shares Required for Veto Decision***

A contract explicitly outlines the fraction of the outstanding preferred shares that must vote in favor of vetoing a decision covered by a covenant. As illustrated in figure 3, all contracts in my sample require that at least a 50-percent majority of the preferred shares support a veto and about one quarter (27%) of all contracts require the support of two-thirds or more. As shown in table 8 models 4-6, the fraction required to veto a decision does not correlate with VC board control and investor-friendly cash flow contingencies. I observe that the fraction is higher when a greater number of VCs invest in the financing round. From this observation I infer that the covenant vote appears to be structured in such a way that most of the investing VCs must agree on vetoing a decision.

## **VII. Concluding Discussion**

This paper studies the economic role of covenants in contracts between entrepreneurial companies and their VC investors. Although VCs always hold preferred equity, differences across important contractual terms gives rise to considerable variation in the degree of debt-likeness of VC contracts. VCs could get strong or weak residual control rights depending on the contractual allocation of board seats. Similarly, VCs could be entitled to larger or smaller fixed payoffs depending on the inclusion of investor-friendly cash flow contingencies, such as cumulative dividends, participation rights and the amount required for automatic conversion of the preferred equity. I exploit this variation to test Smith and Warner's argument that including covenants is motivated by the basic design of financial contracts.

While there are many other potential reasons why VC contracts include covenants, my results strongly support logic that debt-like cash flow and control features of a VC contract can amplify the investor's demand for covenant protections. More covenants are included in

contracts that, by entitling VCs to higher fixed payoffs, introduce greater divergence between the VCs' preferred stock and an entrepreneur's common stock. More covenants are included when VCs do not control a majority of the board seats. Furthermore, as predicted by Smith and Warner, most covenants in VC contracts circumvent the entrepreneur's ability to engage in claim dilution, asset substitution, or overinvestment.

I add to the growing literature on VC contracts by conducting the first comprehensive investigation of covenants. I demonstrate that covenants play an economic role in VC investments even though VCs are equity investors with access to other powerful governance mechanisms. This conclusion is motivated by my findings that (i) almost all VC contracts (92%) include covenants, (ii) this inclusion is sensitive to conflicts of interests between VC and entrepreneur, and (iii) even VCs who hold a majority of board seats receive some covenant protection. The importance of covenants means that studies of how VCs control the companies they finance need to consider not only the allocation of board seats but also the allocation of specific decision rights such as covenants.

A caveat to my analysis is that I can make no inference on the optimality of the observed empirical pattern of covenants. Perhaps the contractual protection given to VCs is too generous in the sense that preferred shareholders can make more decisions that expropriate common shareholders than vice versa. My results can be explained by VCs' demand for protection against agency problems pertaining to entrepreneurial decisions. Whether the moral hazard is of sufficient magnitude to imply that covenants and other control rights are optimally allocated between the contracting parties is a question worthy of further study.







