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Changing the Nexus: The Evolution and Renegotiation of Venture Capital Contracts

by

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November 22, 2011

Abstract

We study the evolution and renegotiation of the cash flow rights that venture capitalists (VCs) obtain in their portfolio companies. When company performance between financing rounds is poor, subsequent contracts contain stronger VC cash flow rights, and existing VCs tend to either given new VCs senior claims or forfeit their existing rights altogether. These results are consistent with the importance of financing problems between different VCs, and with theory predicting that financing frictions worsen with poor performance. A consequence is that VC cash flow rights are frequently significantly diluted before exit, implying that VC investments are riskier than previously thought.

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1. Introduction

A large body of financial contracting theory studies how well-designed contracts can alleviate the underinvestment problem that would otherwise occur as a result of financing frictions between companies and outside financiers or between the financiers themselves. Perhaps in no other setting is the potential underinvestment problem – the possibility that otherwise positive-NPV projects will not get funded – more pronounced than in the financing of entrepreneurial ventures. The generally limited track record and innovative business plans of entrepreneurial ventures, along with lack of access to liquid public markets, amplify the asymmetric information and agency problems faced by potential investors.

In an influential paper, Kaplan and Strömberg (2003) examine the complex contracts that venture capitalists (VCs) use to mitigate these problems, which include the separate and potentially state-contingent allocation of cash flow and control rights. Their analysis focuses on how these rights vary in the cross-section of companies with the severity and nature of the financing problem. [Kaplan and Strömberg \(2003\)](#) also provide descriptive statistics suggesting that VC contracts evolve over time. Yet, the economic determinants of the evolution and renegotiation of VC contracts, and how these relate to changing financing problems over time, remain unexplored in the literature.

In this paper, we examine the evolution and renegotiation of VC contracts as companies secure new rounds of financing over time before exit. The staging of VC investments acts as an additional control mechanism, forcing companies that are not yet cash flow positive to return periodically for financing or face liquidation ([Gompers, 1995](#)). The downside of staging is that if otherwise positive NPV but cash flow negative companies are unable to secure follow-on funding, they will be pushed into bankruptcy. This is a form of inefficient liquidation.¹

Our analysis focuses on how VC re-contracting over time addresses evolving financing frictions that might otherwise lead to the inefficient liquidation of the ventures they finance. The analysis uses a

¹ In this case, the inefficient liquidation arises from the failure to provide needed financing. Nanda and Rhodes-Kropf (2010) discuss this type of financing risk, and provide a theoretical analysis of its basis in rational equilibrium. This kind of inefficient liquidation differs from that in debt models, which is due to the active decision of debtholders to liquidate following low cash flow realizations (the possibility of which limits debt capacity).

large, unique dataset of VC contract provisions pertaining to the allocation of cash flow rights in U.S. investments by 1,211 unique VCs (482 unique lead VCs) in 1,237 unique startup companies over 1,587 investment rounds, totalling 5,334 unique VC investments. We supplement these data with information on company and VC characteristics and board membership from Venture Economics.

Our main results stem from the observation that staged investment can itself give rise to a type of agency problem that is not present in a first-time investment, that of conflicts between existing and new investors. One issue is similar to the debt overhang problem of [Myers \(1977\)](#), and will be particularly severe when performance between financing rounds has been poor, so that the valuation (price per share) of the company has not increased since the prior round (“down” or “flat” rounds). In such cases, the fixed cash flow rights of the prior-round VCs (such as liquidation preferences and dividend rights) are underwater, and hence new investment would partially subsidize those claims. Knowing this, new-round investors might refuse to invest without contractual protections against such cross-subsidization.² An additional friction in the case of poor performance is that new VCs will be especially concerned about adverse selection, a concern that theory suggests existing investors can mitigate with a costly signal of their confidence in the company.

Consistent with these arguments, we find that the use of seniority provisions is strongly associated with down or flat rounds. Seniority provisions specify that the fixed cash flow rights of new-round VCs are senior to those of prior-round VCs. In this way, they eliminate the possibility of cross-subsidization and constitute a renegotiation downward of the cash flow rights of existing VCs (to which they must agree). As such, seniority provisions also serve as a mechanism whereby existing VCs signal their confidence in the company at some cost to themselves. Another way to limit the possibility of cross-subsidization, and an additional costly signal, is for existing VCs to explicitly forfeit some or all of their

² Of course, there is no cross-subsidization problem if the same VC team as the prior round conducts the new financing round, with each VC obtaining the same relative ownership stake as before. In practice, however, down or flat rounds virtually always involve some change in either the identities of the VCs or their ownership. One explanation for the dominance of changing VC teams in down or flat rounds, emphasized by practitioners and lawyers with whom we have spoken, is that the involvement of a new VC team mitigates self-dealing or breach of fiduciary duty concerns associated with a flat or lower company valuation. Both down and flat rounds are commonly understood in the industry to reflect poor interim performance.

cash flow rights. We also find that this type of renegotiation is more likely to occur in down or flat rounds.

Further consistent with the importance of cross-subsidization concerns between VCs, we find that even when performance is good (“up rounds”), changes in investor composition between rounds are associated with a greater use of seniority provisions. These results are weaker than those for down or flat rounds, consistent with worse financing problems in the latter cases.

Overall, these results suggest that when the value-added services of a different VC team is needed, giving new VCs cash flow rights that are senior to those of existing VCs mitigates cross-subsidization and adverse selection concerns that might otherwise impede investment, especially in down or flat rounds.

In addition to financing problems between VCs, frictions between VCs and the entrepreneur may also be exacerbated over time, particularly following poor interim performance. A wide array of theories, including Sappington’s (1983) extension of the Holmstrom (1979) setup and Bernanke and [Gertler \(1989\)](#), predict that the agency and information costs of financing vary inversely with company performance or net worth. Given the key role of VC cash flow rights in mitigating these frictions ([Kaplan and Strömberg, 2003](#)), these theories suggest that poor interim performance should result in stronger VC cash flow rights in the new financing round.³ An alternative view is that because stronger VC cash flow rights following poor performance would push the entrepreneur’s equity claim even further out of the money, their use might exacerbate risk-shifting or asset substitution problems ([Jensen and Meckling, 1976](#)). In this view, weaker VC cash flow rights would follow poor performance.

Our evidence is consistent with the former view. In down or flat rounds, VC cash flow rights are both stronger relative to the cross-section of companies and evolve so that new-round contracts contain

³ VC cash flow rights protect the VC’s downside and incentivize the entrepreneur by giving her a greater fraction of company cash flows if the company goes public. These rights specify the amounts to which VCs are entitled in excess of their fractional ownership when the firm is liquidated or sold, which are the most common forms of exit for VC-backed companies (Metrick and Yasuda, 2010). In contrast, if the company goes public (a more profitable exit), VCs’ cash flow rights vanish and they receive their fractional ownership. Thus, cash flow rights produce an asymmetry of payoffs, and resulting incentives, that price alone cannot duplicate.

stronger rights than prior-round contracts. As a result, VCs obtain stronger cash flow rights following poor performance instead of spending all of their increased bargaining power on obtaining even lower valuations. This in turn suggests that VC cash flow rights are not simply substituted over time for price, but rather play a key governance role that cannot be duplicated by price alone, because of the asymmetry of payoffs they imply. Overall, the evidence suggests that following poor performance, the cash flow rights of new VCs tend to be both senior to and stronger than those of existing VCs. We stress also that these results cannot be explained simply by the argument that the expected payoff to cash flow rights (as a fraction of company value) is higher following poor performance. This is because expected payoffs can be adjusted using price alone, without need to re-contract on cash flow rights.

Further consistent with this view, using hand-collected data on CEO turnover we find that CEO turnover between rounds is associated with both a greater likelihood of a down or flat round and stronger VC cash flow rights in the new-round contract. Though CEO turnover is admittedly a noisy proxy for performance, this evidence is motivated by and consistent with Hellmann and Puri's (2002) finding that CEO turnover in VC-backed companies is more often than not an adversarial event indicating unsatisfactory performance.⁴

One potential concern is that our results may be driven primarily by flat rounds, as opposed to actual down rounds, to the extent flat rounds dominate down rounds in the data and occur as a result of downward price rigidities in VC follow-on financings (Broughman and Fried, 2011). To the extent this occurs, increased cash flow rights and seniority in flat rounds may be simply a way for VCs to gain economics in the deal that they cannot or do not wish to gain by adjusting the price. While interesting, this possibility would point to different explanations for our findings than the ones we emphasize. However, we find that not only are down rounds twice as prevalent in our data as flat rounds, but, more importantly, none of our key results are driven by flat rounds.

⁴ Because it is the “quasi-debt” nature of the cash flow rights that causes the debt overhang type problem in this setting, one might wonder if the stronger cash flow rights in down/flat rounds that we find exacerbate the problem that the seniority and forfeiture provisions mitigate. In fact there is no conflict between these two sets of results. The debt overhang type problem is generated by the cash flow rights of the prior-round (existing) investors, whereas the stronger cash flow rights that we find are those obtained by the new (current-round) VCs.

Another potential concern is that in most of the analyses described above, we use lack of improvement in valuation as a proxy for poor performance. Ideally, we would like to use predetermined, objective performance measures such as earnings or stock returns, but these are not available for private, start-up companies in the U.S. Fortunately, as we discuss in Section 3, our inferences about the relation between performance and contract terms are not confounded by the fact that valuation and other contract terms are jointly determined as a function of (unobservable) performance. This is true as long as valuation responds positively to performance, because the direct relation between valuation and contract terms – a tradeoff between lower valuation and stronger contract terms – biases us away from finding the results we do.⁵ Our time-series analysis also has the advantage that one of the most pervasive and vexing concerns for the cross-sectional VC literature, unobserved heterogeneity in company quality, does not confound our conclusions. Instead, the contracting responses to within-company changes in quality over time is the very focus of our analysis.

A limitation of our analysis is that we do not have information on the control rights that VCs obtain in their financing contracts ([Kaplan and Strömberg, 2003](#)). While an analysis of the time series of VC control rights would be interesting in its own right, this limitation is unlikely to bias any of our conclusions. Conflicts between VCs related to debt overhang type problems are pure cash flow issues, and cannot be addressed by control rights. However, like cash flow rights, control rights can be used to address agency problems between VCs and entrepreneurs. Consistent with this, Kaplan and Strömberg (2003) report that cash flow and control rights are positively correlated. Consequently, it is likely that control rights would likewise strengthen following poor performance, which would only strengthen our conclusions. Indeed, our point estimates suggest that new VCs are more likely to join the board of directors following poor performance, though the estimates are not quite statistically significant.

⁵ Intuitively, given some limit on bargaining power, at the margin a VC could choose between a more favorable (lower) valuation or more favorable (stronger) cash flow rights. This tradeoff implies that holding all else fixed, a lower valuation would be accompanied by weaker contract terms. Consequently, the direct relation between contract terms and valuation, holding performance fixed, implies the opposite of our results.

Our work contributes to several branches of literature. Our findings on the use of seniority provisions and the forfeiture of existing VCs' cash flow rights have important implications for work attempting to measure the riskiness of VC investments. Our findings imply that the cash flow rights of early-round VCs are frequently significantly diluted before exit. Because of lack of data on cash flow rights, existing estimates of the riskiness of VC investments do not take the expected-value consequences of the dilution of cash flow rights into account (e.g., [Cochrane, 2005](#); Korteweg and Sorensen, 2010). Consequently, our results imply that VC investments, particularly early-round investments, are riskier than estimated in the literature.

Our analysis also adds a novel time-series dimension to the literature examining the cross-sectional determinants of VC contract design through an agency lens. This literature includes Gompers (1998), Kaplan and Strömberg (2003, 2004), Bottazzi, Da Rin, and Hellmann (2008, 2009), Lerner and Schoar (2005), Kaplan, Martel, and Strömberg (2007), Cumming (2008), Bengtsson and Ravid (2010), and Bengtsson and Sensoy (2011). See Metrick and Yasuda (2011) and DaRin, Hellmann, and Puri (2011) for surveys of the VC literature.

In broader contracting sense, our work adds to our knowledge of the economic forces guiding whether non-price dimensions of contracts can or cannot be substituted for price. Bradley and Roberts (2003) examine whether debt covenants are priced.

Finally, our work adds to the nascent empirical literature providing evidence on the renegotiation of financial contracts outside of distress or bankruptcy. Such evidence is important (yet scarce) given the key role played in financial contracting theory by the possibility of renegotiation outside distress (e.g., [Hart and Moore, 1994](#)), a point emphasized by Roberts and Sufi (2009a). By providing some evidence on this important issue as entrepreneurial firms secure VC financing over time, our work complements recent research by [Roberts and Sufi \(2009b\)](#), who study the renegotiation of credit agreements between bank lenders and public corporation borrowers, [Benmelech and Bergman \(2008\)](#), who study renegotiation of airplane lease terms, and Broughman and Fried (2010), who study the renegotiation of VC cash flow rights at time of liquidation and find that it is rare. These papers all focus on the interactions between

financiers and the companies/entrepreneurs they finance. Our analysis is unique in this branch of literature in that we also consider frictions arising from interactions between the financiers themselves.

This paper proceeds as follows. Section 2 describes the sample and data sources. Section 3 discusses our empirical strategy. Section 4 presents our main findings. Section 5 presents robustness tests and some empirical extensions. Section 6 concludes.

2. Sample and data sources

2.1 Sample overview

Our sample of VC contractual terms comes from 5,334 U.S. VC investments in 1,587 financing rounds involving 1,237 unique U.S. companies, 1,211 unique VC investors, and 482 unique lead VC investors. All financing rounds in the sample are follow-on (i.e., not first round) investments. We obtain the data from the consulting firm VCExperts. VCExperts collects the data from publicly available (but difficult and costly to access) legal documents called Certificates of Incorporation. All corporations, public and private, are required by their states of incorporation to file these Certificates with the state when making changes to their outstanding equity, including issuing preferred stock to VCs.

An important advantage of our data is that there are no obvious sample selection issues that could bias our results. Because the filings are legally required, they are not subject to any voluntary reporting biases. Moreover, according to VCExperts, the data are random draws from the population within years and were not selected based on company or VC characteristics.⁶ Moreover, as described in more detail below, the data are representative on several key dimensions of the Venture Economics (VE) universe of VC investments.

The Certificates of Incorporation provide detailed and comprehensive information on the cash flow rights to which VCs are entitled pursuant to the financing contract, which are our main interest here and which are a coherent set of provisions to analyze in light of our motivating hypotheses. Specifically,

⁶ Because accessing the data from the states of incorporation is costly, VCExperts does not attempt to collect information on contractual terms for the entire universe of VC investments, but instead aims for a large representative sample.

the certificates contain information on downside protecting cash flow rights, including liquidation preferences, dividend rights, participation rights, and anti-dilution provisions, as well as information on whether current round investors' rights are senior to those of prior-round investors and whether prior-round investors are forfeiting any of their existing cash flow rights as part of the new financing contract. (We describe each of these provisions in detail in Section 2.3 below.) The certificates also allow us to infer whether the valuation of the company has increased or not since the last financing round, but do not suffice to infer the actual magnitude of the change in valuation.⁷ The certificates also contain information on other meaningful provisions of the contract, such as pay-to-play provisions and redemption rights.

While the size of the sample and the breadth of information covered offer significant advantages for our purpose, it is important to point out that Certificates of Incorporation do not constitute or describe all the terms of the contracts between VCs and the companies they finance. Many of the terms that we do not analyze are standardized and exhibit no, or almost no, variation in their use. It would therefore not be meaningful to study how such terms evolve and are renegotiated in follow-up rounds. However, we do face the limitation that the certificates do not provide comprehensive information about the exact allocation of non-standardized control rights, voting rights, and equity vesting schedules. Because [Kaplan and Strömberg \(2003\)](#) document a positive correlation between cash flow and control rights, it is likely that if we were able to also analyze such terms, our conclusions would only strengthen.

For each investment we find the matching financing round in VE and extract data on company, VC, and round characteristics.⁸ From VE we also identify all the VCs that invested in the round and the prior round, which enables us to determine whether investor composition has changed. VE also provides a

⁷ The certificates indicate whether the price per share has increased from the prior round, which corresponds exactly to an increase in valuation. By valuation, we mean the claim on the company owned by all shareholders from the prior round. That is, our comparison is from the post-money value of the prior round to the pre-money value of the current round; we do not erroneously include new money invested by new round investors as part of the valuation. While the certificates contain information on the number of preferred shares outstanding, they generally do not contain information on the number of common shares outstanding (rather, they list the number of common shares authorized). As a result, it is not possible to calculate the exact magnitude of the valuation change. However, even a directional indication for valuation changes in a large sample is a major improvement over commercial private equity databases, which rarely contain valuation information for successive financing rounds (Kaplan, Sensoy, and Strömberg, 2002).

⁸ VE's coverage of VC investments is good but not complete ([Kaplan, Sensoy, and Strömberg, 2002](#)). Our contract sample consists only of contracts for which we could find the matching round in VE.

list of company board members and their affiliations. VE board data are not round-specific and do not indicate when a given member joined the board. Our analysis of board seats is limited as a consequence of these data limitations.

We supplement these data with hand-collected information on whether the founder is a repeat entrepreneur and if so the outcome of the founder's previous venture. For a subsample of the data, we hand-collect information on whether the CEO changed between financing rounds.

2.2 *Company, round, and VC summary statistics*

Panel A of Table 1 provides a statistical overview of the sample. The sample is recent: 14% of financing rounds were completed in 2008, 44% in 2007, 30% in 2006, 10% in 2005, and 3% in 2004. The sharp increase beginning in 2006 arises because VCExperts began collecting the data in 2006, and chose to focus on recent financing rounds.

Most of our sample involves investments in companies located in California (605 rounds, or 38%) or Massachusetts (237 rounds, or 15%). Texas and New York account for a further 7% and 5% of rounds, respectively.

As mentioned above, because we wish to study contract evolution and renegotiation from one round to the next, we do not include first round investments in the sample. Rather, the unit of analysis is a follow-on (second or higher) round, for which we obtain information about the prior round as needed from the Certificates of Incorporation and from VE. 402 (25%) of the financing rounds are second round financings, 337 (21%) are third round financings, 290 (18%) are fourth round financings, and the remaining 558 (35%) are fifth or higher rounds.

The industry distribution of our sample (using VE industry classifications) is as follows. 217 (14%) of our financing rounds involve companies in biotechnology, 354 (22%) in software, 299 (19%) in internet-related lines of business, 221 (14%) in medical industries other than biotechnology, 169 (11%) in semiconductors, and the remaining 327 (21%) in other VE industry groups.

Panel A of Table 1 also shows that sample is largely representative of the Venture Economics universe for the period 2005-2008 (97% of our sample) on the key dimensions of company location,

round number, and industry group. The largest (still small) discrepancies are that compared to Venture Economics, we very slightly undersample companies from California (38% compared to 41%), and even more slightly oversample companies from Massachusetts (15% compared to 12%). We also have slightly fewer second round observations (25% compared to 28%) than VE. In terms of industry distribution, the match with VE is very close though we slightly oversample biotechnology companies (14% compared to 10%) and internet companies (19% compared to 16%) and slightly undersample software companies (22% compared to 25%). In any case, in our multivariate specifications we control for company location, round number, and industry by including corresponding fixed effects.

Panel B of Table 1 provides summary statistics for other explanatory variables we use in various specifications. 73% of financing rounds involve an increase in valuation from the prior round (up rounds), whereas 27% do not (down or flat rounds). 9% of financing rounds are flat rounds, in which the valuation does not change from the prior round, and 18% are down rounds, in which the valuation decreases from the prior round. In the industry, both down and flat rounds are commonly understood to signify poor performance from the prior round.

We identify three types of possible changes to the investor composition between rounds. The first is that at least one VC that did not invest in the previous round enters in the new round. This happens in 48% of cases. The second is that at least one VC that invested in the previous round exits by not investing in the new round. Such change happens in 80% of cases. Finally, we define a variable that captures whether any such change to the composition of VCs occurred. This happens in 88% of cases. The fact that there are such frequent changes to the composition of VCs underscores the potential importance of evolving financing problems between VCs over time.

At the time of a financing round, the average sample company is 5.58 years old. 23% of founders are serial founders. 6% (8%) of founders are serial founders whose prior venture exited in an IPO (merger or sale). 13% of financing rounds involve an early- or seed-stage company. The average financing round investment amount is \$12.6 million and that the average number of VCs in the round is 4.7. We do not

use these variables as control variables in our tests, because they may be endogenously determined (our results are robust to including them).

The average lead VC in a sample financing round had previously invested in 179 distinct companies (VC experience) up to the time of the financing round. 37% of lead VCs are headquartered in California. 77% of lead VCs are private partnership VCs, 4% are bank VCs, and 5% are corporate VCs. In 44% of financing rounds, the company and VC are geographically located in the same state. 24% of lead VCs focus their investments in the same industry as the focal company, where industry focus is defined as the industry accounting for the highest percentage of the VC's previous investments using the VE 10-industry classification. 36% of lead VCs focus their investments on companies in the same state as the focal company, defined analogously.

2.3 Description of contractual terms and summary statistics

As discussed above, the Certificates of Information include information on the downside-protecting cash flow rights that all VCs in a financing round receive and that are attached to the class of preferred stock they are issued. They also contain information on the seniority (if any) of the current-round VCs' cash flow rights compared to those of the prior-round VCs and whether or not the prior-round VCs have agreed to give up any of their cash flow rights from the prior round. Importantly, both seniority provisions and explicit forfeiture of existing cash flow rights constitute a renegotiation downward of prior-round VCs' rights. This is because the rights of prior-round VCs can legally be altered only with their consent (generally, with a majority or two-thirds vote of the prior-round VCs' preferred stock). We discuss each of these in turn.

2.3.1 Cash flow rights

The cash flow provisions in the Certificates of Incorporation apply identically to all investors in a given financing round. The provisions we study are cumulative dividend rights, liquidation preference,

participation rights, and anti-dilution rights.⁹ These four provisions all affect the cash flow rights that are attached to the preferred stock that VCs receive in exchange for their investment. Our motivation for focusing on these terms is twofold. First, they constitute the most important cash flow rights affecting the division of cash flows between the VC and the entrepreneur at exit. Second, unlike the large number of boilerplate aspects of VC contracts, these terms exhibit considerable variation in their use. This variation is important for our purposes since we are interested in understanding the tradeoffs relevant for changes to the contract design.

Cumulative dividend rights, liquidation preference, participation rights jointly specify the amounts to which VCs are entitled if they retain their preferred stock when the firm is liquidated or sold, which are the most common forms of exit for VC-backed companies (Metrick and Yasuda, 2010). Broughman and Fried (2010) find that deviations from this contractual priority in actual liquidations or sales are infrequent and small. If it is advantageous for them to do so, VCs can instead convert their preferred shares to common upon exit and receive their fractional ownership instead. Effectively, then, these cash flow rights specify the amounts VCs are entitled to be paid in excess of their fractional ownership upon liquidation or sale. In contrast, if the company goes public, which is typically a much more profitable exit, VCs' preferred stock virtually always automatically converts to common stock, their cash flow rights vanish, and they receive their fractional ownership. These provisions are thereby downside protections for the VC. In downside outcomes, the worse the outcome, the greater the relative impact of VC cash flow rights on the ultimate division of company cash flows. As a result, VC cash flow rights help address financing problems by protecting VCs' downside and incentivizing the entrepreneur by giving her a greater fraction of company cash flows if the company goes public.

Anti-dilution rights work somewhat differently. They give the VC more shares if the company secures a subsequent financing round at a lower valuation, which increases the amount the VC expects to receive upon an eventual exit. In this way, anti-dilution provisions are also downside protections, but are

⁹ In the Section 5, we also describe and analyze redemption rights and pay-to-play provisions, which are also spelled out in the Certificates of Incorporation and have a related, but different role in VC financings to the main provisions of interest.

triggered not upon exit, but upon an intermediate financing round at a lower valuation. To avoid issuing the VC more shares, the entrepreneur has an incentive to perform well so that follow-up financing rounds are held at higher valuations. More detail on the exact meaning of each cash flow provision is provided in Table 2. See also Kaplan and Strömberg, 2003, and Metrick and Yasuda, 2010, for further detailed descriptions and evidence supportive of the strong economic importance of these cash flow provisions.

Panel A of Table 2 provides summary statistics on the use of these cash flow provisions in our sample of 1,587 financing rounds. For each provision, we code the strength of the downside protection it offers the VC, with 1 reflecting a stronger protection and 0 reflecting a weaker. These codes are given in parentheses below.

Regarding participation rights, 32% of contracts have no participation rights (0), 23% have capped participation rights (1) and 46% have uncapped participation rights (1). Liquidation preference exhibits less cross-sectional variation. 92% of our sample contracts have a 1X liquidation preference (0) and 7% have above 1X and up to 2X (1). Only 1% have a liquidation preference above 2X (1). Regarding cumulative dividend rights, 68% of sample contracts have no dividend rights (0), 26% receive a cumulative annual dividend of 8% or below (1), and 6% receive a dividend greater than 8% (1).

For anti-dilution provisions, 2% of contracts do not give investors this protection (0). 88% of contracts contain weighted-average anti-dilution (0) and 10% of contracts contain full-ratchet anti-dilution (1), with the latter protection being especially favorable to investors.

2.3.2 Description of renegotiation provisions and summary statistics

Panel B of Table 2 describes and presents summary statistics on the extent to which prior-round VCs' cash flow rights are renegotiated downward as part of the new financing round. For each renegotiation dimension, we code how favorable it is to new round investors at the expense of previous round investors. The code 1 reflects more favorable and 0 reflects less favorable (i.e., no renegotiation). These codes are given in parentheses below.

The first way renegotiation can happen is by the use of seniority provisions by which the cash flow rights of current-round VCs are senior to those of existing VCs upon exit. This is the case in 42% of

contracts (1). In 57% of contracts, the rights of new-round VCs are pari-passu or equal to those of existing VCs (0). In only 0.4% of cases, that is 6 contracts, new-round VCs actually receive a junior claim (0).

The other, less common way that previous round VCs can lose some of their cash flow rights is by explicitly forfeiting them. This happens in 8% of cases. Of these cases, most often existing VCs have to convert to a class of preferred stock with fewer rights, which is typically labeled “shadow preferred” (1). In 1% of contracts, existing VCs convert to common and lose all their cash flow rights (1).

3. Empirical Strategy

The hypothesis we want to test is that the use of stronger cash flow rights, or the renegotiation of prior rights, will be associated with poor performance from the prior financing round. Ideally, we would like to measure performance using objective, predetermined measures such as stock returns or statements of operating income or revenue. Unfortunately, these measures are not available for private firms in the U.S. Consequently, we rely on information from the Certificates of Incorporation allowing us to determine whether the valuation (price per share) of the company has increased, decreased, or stayed the same since the last financing round, and test whether stronger (or renegotiated) cash flow rights are associated with a lower or unchanged valuation (down/flat rounds). In this way, we use the change in valuation as a proxy for performance in our tests.

A concern is whether our inferences suffer from any bias due to the fact that in reality, valuation and other contract terms are jointly determined as a function of (unobservable) performance as part of the negotiations between VCs and the entrepreneur and between the VCs themselves. Fortunately, our conclusions are not confounded under two conditions, which together are our identifying assumptions.

First, valuation must respond positively to unobservable performance, so an increase in valuation is more likely when the company has performed well. This seems uncontroversial.

Second, the direct relation between contract terms must be a tradeoff between lower valuation and stronger contract terms. Economically, it is hard to imagine how this could not hold given some limit on the new VCs’ bargaining power. A limit to bargaining power implies that at the margin a VC could

choose between either a more favorable (lower) valuation or more favorable (stronger) cash flow rights. Holding all else fixed, a lower valuation (price per share) would then be accompanied by looser contract terms (weaker downside-protecting cash flow rights, less use of seniority provisions, and less frequent forfeiture of existing VCs' rights). Or, equivalently, the VC might be willing to pay a higher valuation (price per share) but would insist on stronger cash flow rights as compensation (again, holding all else fixed). (The same argument holds for the renegotiation downward of prior-round VCs rights.)

Under these identifying assumptions, if we find (as we do) that stronger cash flow provisions are positively associated with down/flat rounds, we can be confident that this implies a negative association between the strength of cash flow provisions (or the renegotiation or prior-round VCs' rights) and unobservable performance. Intuitively, this is because the direct relation between contract terms and valuation, holding performance fixed, implies the opposite of our results and therefore only biases us away from finding the results we do.

To see this formally, first suppose that both valuation changes and changes in cash flow rights respond to unobservable performance, and that in addition there is a direct term-pricing tradeoff for a given level of performance. That is, suppose the true data generating process were given by (suppressing constant terms and other controls):

$$CF = \alpha P + \beta VDF + \varepsilon . \quad (1)$$

and

$$VDF = \gamma P + \delta CF + \mu . \quad (2)$$

where CF is the (change in) the strength of cash flow rights (or the renegotiation of these rights), VDF is an indicator variable for whether valuation is down or flat (as opposed to up) compared to the previous round, P is unobservable performance of the company, and ε and μ are independent, mean zero disturbance terms. In words, equation 1 says that cash flow rights adjust to changes to company performance, and equation 2 says that there is a term-pricing tradeoff. Because we cannot observe P, the estimable equation is:

$$CF = bVDF + e. \quad (3)$$

The question is, under what circumstances can we infer the sign of α , which we cannot estimate, from the sign of b , which we can estimate? Using (2) to solve for P in terms of VDF and CF , substituting into (1) and rearranging yields:

$$CF = \frac{\beta + \alpha/\gamma}{1 + \alpha\delta/\gamma} VDF + v. \quad (4)$$

where the composite error term v is given by $v = \frac{\varepsilon - \alpha\mu/\gamma}{1 + \alpha\delta/\gamma}$.

Comparing (3) and (4):

$$b = \frac{\beta + \alpha/\gamma}{1 + \alpha\delta/\gamma}. \quad (5)$$

Applying our identifying assumptions, if valuation responds positively to performance, then we have $\gamma < 0$; a down or flat round is less likely when performance is good. If the direct relation between cash flow rights and valuation, controlling for performance, is that VCs can choose at the margin between more favorable (lower) valuation and more favorable (stronger) cash flow rights, so that all else equal a lower or flat valuation is compensated by weaker cash flow rights, then we have $\beta < 0$ and $\delta < 0$.

Suppose in truth $\alpha = 0$. Then, from (5), unambiguously $b < 0$. Now suppose in truth $\alpha > 0$. Then the numerator in (5) is unambiguously negative and the denominator is unambiguously positive, so again unambiguously $b < 0$.

As we show in Section 4 below, in the data we observe that in fact $b > 0$; empirically there is a positive association between a down/flat round and the strength of VC cash flow rights and the renegotiation of prior-round VCs' rights. Therefore, from (5), it must be that $\alpha < 0$. In other words, because we observe a positive relation between the strength of cash flow rights (or the renegotiation thereof) and a down/flat round, under our identifying assumptions we can conclude unambiguously that the relation between the strength of cash flow rights and unobservable performance is negative, $\alpha < 0$. Thus, our results may be biased due to a possible (and plausible) pricing-term tradeoff but if so they are

biased *against* finding what we do. As a result, none of our inferences are confounded by the fact that valuation and other contract terms are jointly determined in equilibrium.

In addition, using valuation changes as a proxy for performance in our tests has the advantage of allowing us to directly infer whether cash flow rights are substituted for price over time. If we find, as we do, that down/flat rounds are associated with stronger cash flow rights and renegotiation of existing rights, we can infer that new-round VCs spent some of their bargaining power on these rights, and some on a lower/flat valuation. By the pricing-term tradeoff argument given above, it follows that VCs could have instead obtained even lower valuations by spending all their bargaining power on price alone. Consequently, this finding allows us to conclude that these rights are not simply substituted by changes in price in response to poor performance over time.

There are two other identification issues worth discussing. The first is the question of whether the lack of control rights in the data could bias our conclusions, despite the argument presented above. This could occur if there were a negative correlation between cash flow and control rights, and if as a result the valuation/cash flow rights tradeoff we envision does not exist, and instead any tradeoff with valuation involves only control rights. However, this possibility is inconsistent with Kaplan and Strömberg's (2003) evidence that cash flow and control rights are positively correlated.

The second is to emphasize that our time-series analysis is not confounded by a key concern plaguing much of the cross-sectional VC literature, that of unobserved heterogeneity in company quality. Instead, the contracting responses to within-company changes in quality over time is the very focus of our analysis.

4. Empirical Evidence

4.1 Univariate analysis

Table 3 provides univariate analysis of how the use of and changes in cash flow provisions are related to the change in company valuation from the previous round.

Panel A shows that when valuation is lower or unchanged, contracts are more likely to include participation rights, more likely to have a liquidation preference above 1X, more likely (but not significantly so) to include dividend rights, and more likely to include full-ratchet anti-dilution protection. Panel A also shows that when valuation is lower or unchanged, the rights of existing VCs are more likely to be renegotiated downward. Down/flat rounds are associated with more frequent use of seniority provisions and more frequently involve prior-round VCs giving up their existing cash flow rights. As an empirical matter, down/flat rounds virtually always include some change in either the identities of the VCs or their relative ownership stakes, so the potential for conflicts of interest among VCs is virtually always present in down/flat rounds. Panel A also shows that even when valuation has increased, changes in investor composition are positively associated with the use of seniority provisions.

It is possible that a contract with stronger cash flow rights in the round that we analyze also had stronger cash flow rights in its preceding round. If stronger cash flow rights in the prior round are more common for companies that turn out to realize poor performance before the next round, then the estimates above would be biased.

To address this concern, Panel B of Table 3 considers a subsample of our main sample for which we have information on the cash flow provisions for two sequential financing rounds for the same company. We require such pairs to be at least 6 months apart to ensure that they represent distinct financing events. We have data for 227 pairs. Panel B first provides summary statistics on the frequency and direction of changes in cash flow rights for this sample, that is, how often and in what direction the cash-flow rights of the new-round contract differ from those of the prior-round contract. We find that changes to cash flow rights are commonplace in VC contracts: four in ten contracts have a change in at least one provision. Of those, changes to stronger or weaker provisions are about as likely, whereas instances of changes to stronger for one term and weaker for another term are relatively rare. Overall, this supports the argument that VC contracts dynamically adjust between financing rounds.

Panel B also shows that within-company changes to stronger cash flow rights are more likely when valuation has not increased. We find similar results when studying companies for which the CEO

has been replaced before the new round. Panel B shows that replacing the CEO between rounds is more likely when valuation has not increased, so CEO replacement is a proxy for poor company performance.

All the results reported in Table 3 are consistent with the motivating theory that predicts that financing frictions between companies and outside financiers worsen with poor performance and that, when investor composition changes, new-round investors obtain contractual protections against cross-subsidization problems that would otherwise impede investment.

Of course, these univariate analyses do not control for other company and VC characteristics that may impact contract design. To address this, we next turn to multivariate specifications.

4.2 Multivariate analysis

4.2.1 Strength of cash flow rights

Table 4 provides evidence in a regression framework on how the strength of downside-protecting VC cash flow rights is cross-sectionally related to whether valuation has increased since the prior financing round. Because all VCs in a given financing round receive the same contract, we take as the unit of analysis is a financing round. Our results are robust to entering each VC investment as a separate observation (which in the case of syndicated rounds produces multiple observations per financing round).

In Table 4, we include controls for company age (in years), company stage (early stage dummy), whether the founder is a serial founder without a successful exit, with a previous IPO, or with a previous merger, as well as round number fixed effects, fixed effects for company industry (VE 10-industry classification), location (CA, MA, NY, TX, and other) and the year of the financing round. We omit controls for other observables that are simultaneously determined with cash flow rights and valuation as part of the financing round, such as the number of VCs in the round and the amount invested in the round, but our results are similar if we include them. Additionally, even-numbered columns contain controls for lead VC characteristics, including the experience of the VC (which Bengtsson and Sensoy, 2011 show to be an important determinant of VC cash flow rights) and indicator variables for whether the VC is located in the same state as the company (a proxy for monitoring costs), whether the VC is a private partnership, corporate, or financial (bank) VC, and whether the VC's investments are focused in the same industry or

state as the focal company. All VC controls are based on the lead VC in the round (Table 7 shows that results are robust to including all VCs in the round and VC fixed effects). Standard errors are clustered by company to control for the fact that for some companies we have more than one round. Results are robust to instead clustering on industry, which admits a broader set of residual cross-correlations.

Columns 1-8 report marginal effects, evaluated at the mean, from probit specifications in which the dependent variables take on the value of 1 if the contract contains participation rights (columns 1-2), contains a liquidation preference greater than 1X (columns 3-4), contains dividend rights (columns 5-6), or contains full-ratchet anti-dilution protection (columns 7-8), and 0 otherwise. All point estimates indicate that a down/flat round is associated with stronger of each of these VC cash flow rights, though the estimates for dividend rights alone are not quite statistically significant. Results are statistically and economically similar using linear probability (OLS) specifications instead.

Columns 9-10 aggregate these cash flow provisions to one index where the main cash flow provision dummies are added together. The index ranges from 0 to 4, and the estimates are based on a negative binomial specification. The estimates indicate that, taken as a whole, down or flat rounds are strongly associated stronger VC cash flow rights. Again, these results hold in OLS specifications as well.

Overall, the evidence in Table 4 shows that companies whose valuation has not increased since the last financing round give VCs stronger cash flow rights than otherwise similar companies whose valuation has increased. These results also show that VC cash flow rights are not “priced out”. Rather than VCs trading-off more favorable pricing against less favorable cash flow rights, and so substituting price for cash flow rights, poor performance is instead associated with both more favorable valuations and more favorable cash flow rights for the VC.

However, the analysis of Table 4 is cross-sectional in nature, and so is subject to concerns about unobserved cross-sectional heterogeneity in company quality. In the next subsection, we conduct a within-company analysis that circumvents this concern.

4.2.2 Within-company evolution of cash flow rights

In Table 5 we present within-company estimates for the subsample of 227 companies for which we have information on the cash flow provisions for two sequential financing rounds for the same company. We run probit specifications in which the dependent variable is equal to 1 if at least one of the cash flow provisions in the new-round contract is stronger than in the prior-round contract, and 0 otherwise.

Consistent with Table 4, Table 5 shows that evolution to stronger VC cash flow rights is more likely when company performance between rounds is poor, so that company valuation has not increased (columns 1-2). Column 3 further shows that evolution to stronger cash flow rights is more likely when the CEO has been replaced between rounds, which is also a proxy for poor performance given Hellmann and Puri's (2002) finding that CEO turnover in VC-backed companies is more often than not (60% of the time) an adversarial event indicating poor performance.

4.2.3 Renegotiation of cash flow rights

Whereas Table 5 compares whether new-round contracts contain stronger cash flow provisions than prior-round contracts as a function of company performance, in Table 6 we examine the determinants of the renegotiation (downward) of prior-round VCs' cash flow rights through the use of seniority provisions or the explicit forfeiture of existing VCs' rights. For this analysis, we do not need information on the exact cash flow rights from successive financing rounds for a given company. This is because the Certificates of Information for a given round tell us whether the rights in that round are senior to the prior round rights and whether prior-round investors forfeit some of their existing rights as part of the new financing contract. As a result, for this analysis we effectively have a sequential sample already and so are able to use the full sample of 1,587 financing rounds. We emphasize that these analyses are time-series in nature, because both the dependent (change in rights via renegotiation) and independent (change in valuation) variables are within-company changes. Thus, these analyses are not subject to concerns about unobserved cross-sectional heterogeneity in company quality.

Columns 1-2 in Table 6 show that the use of seniority provisions is much more common in down/flat rounds than in up rounds. In down or flat rounds, the likelihood is greatest that existing VCs'

fixed claims will turn out to be underwater and that new financing would subsidize those claims in the absence of contractual protections. Moreover, as an empirical matter, down or flat rounds virtually always involve some change in either the identities of the VCs or the relative investment amounts of each VC, so new VCs, or those increasing their stakes, will not want to subsidize others. The results in Columns 1-2 are supportive of the idea that VCs are able to successfully contract around this “debt overhang” problem which would otherwise impede investment. Seniority provisions eliminate the possibility of cross-subsidization and constitute a renegotiation downward of the cash flow rights of existing VCs (to which existing VCs must agree).

Another way to limit the possibility of cross-subsidization is for existing VCs to explicitly forfeit some or all of their cash flow rights. Indeed, Columns 5-6 of Table 6 show that this kind of renegotiation is also more likely to occur in down or flat rounds.

Further consistent with the importance of cross-subsidization concerns between VCs, we find that even when performance is good (“up rounds”), changes in investor composition between rounds are associated with a greater use of seniority provisions (Columns 3-4). However, in untabulated results we also find that in up rounds, when the VC team remains the same but the relative ownership stakes among the team change, seniority provisions are no more likely to be included than when all ownership stakes remain constant as well. These results suggest that when the value-added services of a different VC team is needed, giving new VCs cash flow rights that are senior to those of existing VCs mitigates cross-subsidization concerns that might otherwise impede investment. However, consistent with the argument above that cross-subsidization concerns become especially acute in down/flat rounds, and are less severe in up rounds, changing ownership stakes alone among a constant VC team in up rounds are not associated with greater use of seniority provisions.

Overall, the evidence in Table 6 is consistent with the view that financing problems between VCs, as well as those between the VCs and the entrepreneur(s), are important frictions to the financing of entrepreneurial companies and that VCs are able to successfully contract around these frictions. Our results also demonstrate that new round VCs do obtain more favorable pricing in exchange for less

renegotiation downward of previous round VCs' claims. Rather, they obtain both simultaneously. This, again, demonstrates that VC cash flow rights are not "priced out" over time but rather adjusted to mitigate changing financing frictions, in this case between the VCs themselves.

5. Robustness and extensions

5.1 VC fixed effects and all VCs in round

Table 7 shows that all of our main results are robust to including VC fixed effects instead of controls for various VC characteristics. These specifications address the concern that perhaps some VCs are more likely than others to permit evolution or renegotiation of their contracts, and if so our inferences may be confounded by a VC taste or preference effect.

Panels A and B show that the results are robust when we use each VC investment as a separate observation (i.e., when we include all VCs in a round, not just the lead VC), and when we restrict attention to the lead VC only in a VC fixed effects framework rather than controlling for characteristics. Panel A results are also robust to OLS specifications that double cluster by company and VC to account for the fact that all VCs in a round receive the same contract.

5.2 Separating down and flat rounds

One potential concern is that our results may be driven primarily by flat rounds, as opposed to actual down rounds, to the extent flat rounds dominate down rounds in the data and occur as a result of downward price rigidities in VC follow-on financings (Broughman and Fried, 2011). To the extent this occurs, increased cash flow rights and seniority in flat rounds may be simply a way for VCs to gain economics in the deal that they cannot or do not wish to gain by adjusting the price. While interesting, this possibility would point to different explanations for our findings than the ones we emphasize.

Contrary to this hypothesis, we show in Table 1 that down rounds are actually twice as prevalent in the data (18% of all rounds) as flat rounds (9% of all rounds). In our main specifications, we combine down and flat rounds because both are commonly understood in the industry to indicate poor performance. Table 8 further investigates the possibility that our main results are driven by flat rounds only by breaking out down (lower valuation) and flat (unchanged valuation) rounds separately in the tests.

Table 8 shows that none of the key results are driven by flat rounds. All results with the exception of those for dividend provisions continue to hold for down rounds only. The seniority and forfeiture results are considerably stronger for down rounds compared to flat.

5.3 Extensions to other contract terms and board seats

Columns 1-4 of Table 9 investigates the use of pay-to-play provisions and redemption rights. We find that pay-to-play provisions, which specify that the VC must give up some or all of his cash flow rights if he decides not to invest in a future round, are actually more common in down or flat rounds than in up rounds. This suggests that, in exchange for the other preferences they receive in down/flat rounds, VCs promise to give up some of those preferences should they choose to abandon the company in the future. Such an arrangement can help to align incentives by “binding” the VC to the firm. We see no relation between the inclusion of redemption rights and the incidence of a down/flat round. Redemption rights give the VC the right to put his shares back to the company at a pre-specified date(s) in the future for a pre-specified price (usually the investment amount).

Finally, Columns 5-6 investigate the allocation of board seats. VE provides a list of company board members and their affiliations. VE board data are not round-specific and do not indicate when a given member joined the board. Unfortunately, there exists no source of panel data on the board members of VC-backed entrepreneurial firms. Our analysis of board seats is limited as a consequence of these data limitations. Specifically, we limit the analysis to situations where a new lead VC enters in the financing round to ensure that the VC did not take her seat in a prior round. The coefficient estimates suggest that new lead VCs are more likely to take a board seat in down/flat rounds, consistent with greater information/agency problems, but the results are not quite statistically significant.

6. Conclusion

In this paper, we provide empirical evidence on the frequency, determinants, and outcomes of the evolution and renegotiation of the cash flow rights that venture capitalists obtain in their portfolio companies as VC-backed companies receive successive financing rounds over time before exit.

In doing so, our analysis sheds light on the key economic forces guiding the evolution of VC-backed entrepreneurial companies' nexus of contracts. Rather than being substituted by price over time, VC cash flow rights strengthen following poor performance, consistent with theory predicting that information and agency problems between companies and outside financiers worsen with poor performance. As such, our analysis provides some of the first evidence on the predictions of agency/contract theory for the time-series of VC contract design, as opposed to the cross-section that is the focus of prior work. This evidence is important in light of the preeminent role of the agency framework in our understanding of the financing of entrepreneurial companies.

We also provide novel evidence that financing problems between different VCs, in addition to those between VCs and the entrepreneur that are the emphasis of prior research, are important frictions to the financing of entrepreneurial companies. The renegotiation downward or cram-down of existing VCs' cash flow rights following poor performance implies that the cash flow rights of early-round VCs are frequently significantly diluted before exit. Because existing estimates of the riskiness of VC investments do not take the expected-value consequences of the dilution of cash flow rights into account, our results imply that VC investments, particularly early-round investments, are even riskier than estimated in the literature.

More generally, our findings on the use of seniority provisions and explicit forfeiture of existing VCs' cash flow rights suggest both the importance of problems similar to debt overhang ([Myers, 1977](#)) in the VC setting and the ability of VCs to contract around them. Though the debt overhang intuition is pervasive in finance, our results constitute some of the first evidence in any setting consistent with its empirical importance. Understanding the nature of financing problems between VCs is likely to be an important topic of future research and to lead to significant new insights about the fundamental frictions to the finance of corporations more generally.

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Table 1 - Sample Overview and Summary Statistics

The sample consists of venture capital (VC) follow-up (second and higher rounds) financing contracts from U.S. companies that receive financing from (at least one) U.S. Private Partnership VC. Each contract is matched by company name and round date with an investment round listed in Venture Economics. All VC variables are updated to match the year of the contract. Venture Economics Percent is the fraction of the all U.S. VC investment rounds in the Venture Economics universe from the sample period 2004-2008.

Panel A: Sample Overview

	Unique VC Investments	Unique Rounds	Unique Companies	Unique VCs	Unique Lead VCs	
	5,334	1,587	1,237	1,211	482	
Year of Round	2004	2005	2006	2007	2008	
# of Rounds	40	155	472	695	225	
Percent	3%	10%	30%	44%	14%	
Company Location	CA	MA	TX	NY	Other	
# of Rounds	605	237	107	79	559	
Percent	38%	15%	7%	5%	35%	
Venture Economics Percent	41%	12%	6%	5%	37%	
Round Number	2	3	4	5 or above		
# of Rounds	402	337	290	558		
Percent	25%	21%	18%	35%		
Venture Economics Percent	28%	20%	16%	36%		
Industry Group	Biotechnology	Software	Internet	Medical	Semicond.	Other
# of Rounds	217	354	299	221	169	327
Percent	14%	22%	19%	14%	11%	21%
Venture Economics Percent	10%	25%	16%	14%	11%	24%

Panel B: Summary Statistics (N=1,587)

<u>Focal Variables</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Min</u>	<u>Max</u>
Higher Valuation ("up-round")	0.73	0.45	0.00	1.00
Unchanged Valuation ("flat-round")	0.09	0.18	0.00	1.00
Lower Valuation ("down-round")	0.18	0.38	0.00	1.00
New Round VC Did Not Invest in Previous Round	0.48	0.50	0.00	1.00
Previous Round VC Does Not Invest in New Round	0.80	0.40	0.00	1.00
Any Change in Investor Composition	0.88	0.32	0.00	1.00
<u>Control and Other Variables</u>				
Company Age (years)	5.58	3.74	0.00	53.00
Early Stage Rounds	0.13	0.34	0.00	1.00
Serial Founder	0.23	0.42	0.00	1.00
Serial Successful Founder with IPO	0.06	0.24	0.00	1.00
Serial Successful Founder with Merger	0.08	0.28	0.00	1.00
Round Amount (\$ million)	12.56	13.02	0.05	107.55
Number of VCs in Round	4.68	2.82	1.00	24.00
VC Experience (number of prior investments)	178.99	188.43	0.00	817.00
VC Headquartered in California	0.37	0.48	0.00	1.00
VC Private Partnership Type	0.77	0.42	0.00	1.00
VC Financial Type	0.04	0.21	0.00	1.00
VC Corporate Type	0.05	0.22	0.00	1.00
VC and Company in Same State	0.44	0.50	0.00	1.00
VC Industry Focus	0.24	0.18	0.00	1.00
VC State Focus	0.36	0.30	0.00	1.00

Table 2 - Contractual Cash Flow Rights

This table summarizes the distribution of the cash flow rights (Panel A) and renegotiations (Panel B) in our sample and their coding. Reported indicator variables are the dependent variables that are used in later tables. In Contracts, one observation is a one contract (one financing round, N=1,587).

Panel A: Main Cash Flow Rights Descriptions and Frequency Distributions

Participation

With participation the investor receives both a liquidation preference and a fraction of common stock when the company is sold or liquidated. With no participation the investor holds convertible preferred stock. As an illustration of convertible preferred stock, suppose the VC invests \$2 million at a \$10 million post-money valuation with a 1X liquidation preference. When the company is sold the VC can either claim \$2 million in liquidation preference or 20% (2/10) of the common stock. The VC would choose to convert if and only if the proceeds from the company are above \$10 million. If the preferred stock is instead participating, the VC does not have to choose between the liquidation preference and converting the preferred stock to common stock but instead receives both. Building on the example, participating preferred stock would give the VC both \$2 million and 20% of the common equity. If the company is sold for \$7 million then the VC receives \$2 million in liquidation preference and \$1 million in common stock (20% of the remaining \$5 million). With "Capped" participation the investor only receives the liquidation preference if his investment IRR is below a certain hurdle.

	<u>Included, no Cap</u>	<u>Included, Cap</u>	<u>Not Included</u>	<u>Participation Included Indicator</u>
Contracts	726	360	501	68%
Percent	46%	23%	32%	

Liquidation Preference

The multiple of the investor's investment that is paid back to the investor when the company is sold or liquidated. Liquidation preference is senior to common stock. As an illustration,, for an investment of \$2 million, a liquidation preference of 2X means that the VC gets the first \$4 million of proceeds in liquidation. Unlike cumulative dividends, the amount of the VC's liquidation preference does not increase over time.

	<u>Above 2X</u>	<u>Above 1X, to 2X</u>	<u>1X</u>	<u>Liquidation Pref. Above 1X Indicator</u>
Contracts	19	108	1,460	8%
Percent	1%	7%	92%	

	<u>Change to Stronger</u>	<u>Unchanged</u>	<u>Change to Weaker</u>
Sequential Contracts	12	207	8
Percent	5%	91%	4%

Cumulative Dividends

Dividends that the investor earns annually until the company is sold or liquidated. Cumulative means that the dividends are not paid out annually but when the company is sold or liquidated. Cumulative dividends are senior to common stock. The dividend rights are expressed as a percentage of the VC's investment and are typically compounding, meaning that investors also earn dividends on accumulated, unpaid dividends. As an illustration, suppose the VC invests \$2 million and receives 8% in compounding cumulative dividends. If the company is sold after 5 years for \$10 million, then the VC receives $(1.08^5 - 1) \times \$2 \text{ million} = \0.94 million in dividends.

	<u>Above 8%</u>	<u>8% or Below</u>	<u>Not Included</u>	<u>Dividend Included Indicator</u>
Contracts	88	419	1,080	32%
Percent	6%	26%	68%	

Table 2, continued

Anti-Dilution

The investor is issued additional shares if the company raises a new financing round at a lower valuation than what the investor paid (down round). "Full Ratchet" gives the investor more additional shares than "Weighted Average", especially if the new financing round is small.

	<u>Full Ratchet</u>	<u>Weighted Average</u>	<u>Not Included</u>	<u>Anti-Dil. Full Ratchet Indicator</u>
Contracts	154	1,402	31	10%
Percent	10%	88%	2%	

All Cash Flow Rights

We tabulate the number of cash flow rights (sum of the indicators of participation, liquidation preference, cumulative dividends and anti-dilution dummies, as defined above).

	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Contracts	341	728	421	84	13
Percent	21%	46%	27%	5%	1%

Panel B: Cash Flow Renegotiation Descriptions and Frequency Distributions

Seniority of New Round Rights

Changes the order of which previous round VCs get payoffs when the company is sold or liquidated from liquidation preference and cumulative dividends. Senior means that the new round VCs gets the payoff from cash flow rights at higher priority than the previous round VCs. Pari-passu means that the new round VCs gets the payoff from cash flow rights at same priority as the previous round VCs. Junior means that the new round VCs gets the payoff from cash flow rights at lower priority as the previous round VCs.

	<u>Senior</u>	<u>Pari-Passu</u>	<u>Junior</u>	<u>Seniority Indicator</u>
Contracts	673	908	6	42%
Percent	42%	57%	0%	

Forfeiture of Previous Round Rights

Changes the cash flow rights of the previous round VCs through contractual renegotiation. Renegotiation to Common means that the previous round VCs lose all of their cash flow rights by being forced to convert their preferred shares to common shares. Renegotiation to Shadow Preferred means that the previous round VCs lose some of their cash flow rights (usually anti-dilution protection) by being forced to convert their preferred shares to so called "shadow preferred shares".

	<u>To Common</u>	<u>To Shadow Pref.</u>	<u>No Renegotiation</u>	<u>Forfeiture Indicator</u>
Contracts	19	108	1,474	8%
Percent	1%	7%	93%	

Table 3 - Univariate Analysis

See Table 1 for sample overview, and Table 2 for descriptions on the Cash Flow Rights. Reported percentages reflect the fraction of contracts with a given cash flow right or renegotiation (i.e., the indicators coded in Table 2). Panel A presents a univariate comparison where one observation is one contract (one financing round, N=1,587). Panel B presents a univariate comparison of changes to cash flow rights and CEO replacement for the sample of sequential financing rounds, for which we also have data on the contract from the previous round (N=227). Significance from Wilcoxon rank sum tests marked with *** at 1% level and ** at 5% level.

Panel A: Cash Flow Rights and Renegotiations (Sample is All Contracts, N=1,587)

	Valuation Change Compared to Previous Round		
	<u>Lower or Unchanged</u>	<u>Higher</u>	<u>Difference</u>
Participation	76%	65%	11% ***
Liquidation Preference	15%	5%	10% ***
Cumulative Dividends	35%	31%	4%
Anti-Dilution	15%	8%	8% ***
All Cash Flow Rights	1.42	1.09	0.33 ***
Seniority	65%	34%	32% ***
Forfeiture	13%	5%	8% ***

	Change in Investor Composition for Up-Round (N=1,153)		
	<u>Previous Round VC Does Not Invest in New Round</u>	<u>All Previous Round VCs Invest in New Round</u>	<u>Difference</u>
Seniority	39%	29%	10% ***
	<u>New Round VC Did Not Invest in Previous Round</u>	<u>All New Round VCs Invested in Previous Round</u>	<u>Difference</u>
	36%	25%	11% ***
	<u>Any Change</u>	<u>No Change</u>	<u>Difference</u>
	35%	23%	12% ***

Table 3, continued

Panel B: Changes to Cash Flow Rights and CEO Replacement (Sample is Sequential Contracts, N=227)

Participation

	<u>Change to Stronger</u>	<u>Unchanged</u>	<u>Change to Weaker</u>
Sequential Contracts	18	189	20
Percent	8%	83%	9%

Liquidation Preference

	<u>Change to Stronger</u>	<u>Unchanged</u>	<u>Change to Weaker</u>
Sequential Contracts	12	207	8
Percent	5%	91%	4%

Cumulative Dividends

	<u>Change to Stronger</u>	<u>Unchanged</u>	<u>Change to Weaker</u>
Sequential Contracts	11	199	17
Percent	5%	88%	7%

Anti-Dilution

	<u>Change to Stronger</u>	<u>Unchanged</u>	<u>Change to Weaker</u>
Sequential Contracts	11	208	8
Percent	5%	92%	4%

All Cash Flow Rights

	<u>Change to Stronger</u>	<u>Unchanged</u>	<u>Change to Stronger and Weaker</u>	<u>Change to Weaker</u>
Sequential Contracts	40	144	8	35
Percent	18%	63%	4%	15%

Changes to Cash Flow Rights

<u>Valuation Change Compared to Previous Round</u>			
	<u>Lower or Unchanged</u>	<u>Higher</u>	<u>Difference</u>
Stronger Cash Flow Rights	39%	16%	23% ***
<u>Company Replaces CEO Between Rounds</u>			
	<u>Change</u>	<u>No</u>	<u>Difference</u>
Stronger Cash Flow Rights	36%	19%	18% **

Change of CEO

<u>Valuation Change Compared to Previous Round</u>		
	<u>Lower or Unchanged</u>	<u>Difference</u>
Change of CEO	25%	14% **

Table 4 - Relation between Cash Flow Rights and Change in Company Valuation

See Table 1 for sample overview, and Table 2 for details on the Cash Flow Rights. One observation is one financing round. The dependent variables in specifications 1-8 are indicator variables that take the value 1 if a stronger cash flow right (in an absolute sense) is included and 0 otherwise (see Table 2 for coding details). Specifications 1-8 are probit regressions reporting marginal effects (dP/dX). The dependent variable in specifications 9-10 is the sum of the four dependent variables in columns 1-8. Specifications 9-10 are negative binomial regressions. Lower or Unchanged Valuation is an indicator variable equal to 1 if the company valuation (price per share) is the same or lower than that of the prior financing round. Control variables include company age in years, and indicator variables for whether the company is early or seed stage, whether the company founder is a serial founder, serial founder whose previous company had an IPO, or serial founder whose previous company was acquired. (log) VC Experience is the natural logarithm of the number of historical investments made by the lead VC in the round. Lead VC controls include indicator variables that capture whether the VC is located in the same state as the company, headquartered in California, a private partnership VC, a corporate VC or a financial VC. Lead VC controls also include indicator variables for whether the VC is specialized in the company's industry and/or state, where specialization is defined as the industry or state accounting for the largest fraction of the VC's historical investments. Industry fixed effects are based on Venture Economics 10 industry categories. State fixed effects are California, Massachusetts, Texas, New York, and Other, indicating the state of company incorporation. Standard errors are clustered by company and reported in brackets. All variables are updated to match the year of the financing round. Significance at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Specification	1	2	3	4	5	6	7	8	9	10
Dependent Variable	Participation		Liq. Pref. Above 1X		Dividend		Anti-Dil. Full Ratch.		All CF Rights	
Lower or Unchanged Valuation	0.097*** [0.029]	0.091*** [0.029]	0.077*** [0.019]	0.070*** [0.017]	0.044 [0.030]	0.037 [0.030]	0.059*** [0.018]	0.057*** [0.018]	0.226*** [0.040]	0.214*** [0.039]
Company Age (years)	0.001 [0.004]	0.000 [0.004]	0.001 [0.002]	0.000 [0.002]	0.007* [0.004]	0.005 [0.004]	0.006*** [0.002]	0.005*** [0.002]	0.013** [0.006]	0.010* [0.006]
Early Stage	-0.005 [0.043]	-0.014 [0.043]	-0.013 [0.028]	-0.014 [0.025]	0.05 [0.044]	0.036 [0.044]	0.042 [0.031]	0.032 [0.029]	0.062 [0.070]	0.04 [0.068]
Serial Founder	-0.031 [0.051]	-0.028 [0.051]	-0.019 [0.017]	-0.024 [0.015]	-0.011 [0.046]	-0.015 [0.046]	-0.031 [0.021]	-0.031 [0.020]	-0.079 [0.074]	-0.089 [0.068]
Serial Successful Founder with IPO	-0.077 [0.072]	-0.074 [0.072]	0.06 [0.043]	0.067 [0.043]	-0.126** [0.057]	-0.120** [0.057]	0.063 [0.055]	0.065 [0.055]	-0.071 [0.112]	-0.056 [0.108]
Serial Successful Founder with Merger	0.077 [0.058]	0.073 [0.058]	-0.008 [0.026]	0.005 [0.027]	-0.057 [0.061]	-0.051 [0.061]	-0.015 [0.031]	-0.018 [0.029]	0.006 [0.092]	0.019 [0.087]
(log) VC Experience		-0.045*** [0.014]		-0.023*** [0.006]		-0.046*** [0.013]		-0.012* [0.007]		-0.104*** [0.020]
Observations	1,587	1,587	1,587	1,587	1,587	1,587	1,587	1,587	1,587	1,587
R-squared	0.05	0.06	0.10	0.14	0.15	0.18	0.08	0.10		
Industry, Year and State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Round Number Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead VC Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Table 5 - Relation between Time-Series Changes to Cash Flow Rights and Change in Company Valuation

See Table 1 for sample overview, and Table 2 for details on the Cash Flow Rights. One observation is one financing round for which we have data on cash flow rights from the prior-round contract. All specifications are probit and report marginal effects (dP/dX). The dependent variable takes the value 1 if any of the cash flow rights - participation, liquidation preference, dividends or anti-dilution - is stronger in the current round contract as compared with the previous round contract, and 0 otherwise. Company Replaces CEO is an indicator variable for whether the company replaces the CEO between the current and previous financing rounds. All other variables are defined in previous tables. Standard errors are clustered by company and reported in brackets. Significance at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Specification	1	2	3
Dependent Variable	Stronger Cash Flow Rights		
Lower or Unchanged Valuation	0.185** [0.084]	0.191** [0.088]	
Company Replaces CEO			0.254** [0.103]
Company Age (years)	0.015 [0.015]	0.014 [0.016]	0.025* [0.015]
Early Stage	0.194 [0.128]	0.294** [0.146]	0.323** [0.146]
Serial Founder	-0.048 [0.078]	-0.016 [0.087]	-0.009 [0.091]
Serial Successful Founder with IPO	-0.126 [0.080]	-0.124 [0.077]	-0.128* [0.076]
Serial Successful Founder with Merger	0.168 [0.149]	0.19 [0.161]	0.19 [0.161]
VC Experience		-0.025 [0.025]	-0.024 [0.025]
Observations	227	227	227
R-squared	0.13	0.19	0.19
Industry, Year and State Fixed Effects	Yes	Yes	Yes
Round Number Fixed Effects	Yes	Yes	Yes
Lead VC Controls	No	Yes	Yes

Table 6 - Relation between Renegotiation of Cash Flow Rights and Change in Company Valuation and Investor Composition

See Table 1 for sample overview, and Table 2 for descriptions of the Cash Flow Renegotiations. One observation is one financing round. In Columns 1-4, the dependent variable is an indicator variable equal to 1 if new round cash flow rights are senior to previous round cash flow rights, and 0 otherwise (i.e., pari-passu or junior). In Columns 5-6, the dependent variable is an indicator variable equal to 1 if previous-round investors forfeit some or all of their existing cash flow rights as part of the current financing contract. All specifications are probit reporting marginal effects (dP/dX). New Round VC Did Not Invest in Previous Round is an indicator variable equal to 1 if there is at least one new VC in the current financing round who did not invest in the prior round. Previous Round VC Does Not Invest in New Round is an indicator variable equal to 1 if at least one VC from the previous round does not invest in the current round. All other variables are defined in previous tables. Standard errors are clustered by company and reported in brackets. Significance at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Specification	1	2	3	4	5	6
Dependent Variable	Seniority Indicator				Forfeiture Indicator	
Lower or Unchanged Valuation	0.266*** [0.032]	0.265*** [0.032]			0.052*** [0.015]	0.050*** [0.015]
New Round VC Did Not Invest in Previous Round			0.078*** [0.029]			
Previous Round VC Does Not Invest in New Round				0.096** [0.037]		
Company Age (years)	0.012** [0.005]	0.011** [0.005]	0.004 [0.005]	0.005 [0.005]	0.002* [0.001]	0.002* [0.001]
Early Stage	-0.258*** [0.038]	-0.266*** [0.037]	-0.273*** [0.032]	-0.264*** [0.033]	-0.025* [0.015]	-0.024 [0.015]
Serial Founder	-0.009 [0.047]	-0.01 [0.047]	-0.054 [0.051]	-0.059 [0.051]	0.011 [0.019]	0.011 [0.019]
Serial Successful Founder with IPO	-0.068 [0.068]	-0.055 [0.069]	-0.074 [0.072]	-0.074 [0.071]	0.008 [0.029]	0.007 [0.028]
Serial Successful Founder with Merger	0.013 [0.064]	0.012 [0.063]	0.077 [0.072]	0.085 [0.073]	0.018 [0.026]	0.02 [0.027]
VC Experience		-0.029** [0.015]	-0.027* [0.016]	-0.029* [0.016]		0.003 [0.005]
Observations	1,587	1,587	1,153	1,153	1,587	1,587
Sample	Full	Full	Rounds with Higher Valuation		Full	Full
R-squared	0.12	0.13	0.10	0.10	0.08	0.09
Industry, Year and State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Round Number Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Lead VC Controls	No	Yes	Yes	Yes	No	Yes

Table 7 - Relation between Cash Flow Rights and Change in Company Valuation, VC Fixed Effects

See Table 1 for sample overview, and Table 2 for details on the Cash Flow Rights. In Panel A, one observation is one VC investment. In Panel B, one observation is one financing round. All dependent variables are defined in Tables 4 and 6. Estimation method is OLS. As robustness we also used probit regressions (which in some specifications did not converge due to the inclusion of VC fixed effects) and obtained qualitatively similar results. All other variables are defined in previous tables. Standard errors are clustered by company and reported in brackets. All specifications include VC fixed effects instead of VC controls. Significance at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Panel A: Sample Includes All VCs in Round

Specification	1	2	3	4	5	6
Dependent Variable	Participation	Liq. Pref. Above 1X	Dividend	Anti-Dil. Full Ratch.	Seniority	Forfeiture
Lower or Unchanged Valuation	0.066*** [0.016]	0.083*** [0.009]	0.063*** [0.014]	0.055*** [0.010]	0.208*** [0.016]	0.069*** [0.009]
Company Age (years)	-0.001 [0.002]	0.004*** [0.001]	0.002 [0.002]	0.007*** [0.002]	0.016*** [0.003]	0.004*** [0.001]
Early Stage	-0.038 [0.024]	-0.003 [0.013]	0.004 [0.022]	-0.016 [0.015]	-0.025 [0.025]	0.028** [0.014]
Serial Founder	-0.035 [0.032]	0.017 [0.018]	-0.141*** [0.029]	0.011 [0.020]	-0.04 [0.033]	-0.003 [0.019]
Serial Successful Founder with IPO	-0.033 [0.026]	0.01 [0.014]	0.024 [0.024]	-0.001 [0.016]	-0.203*** [0.027]	-0.018 [0.015]
Serial Successful Founder with Merger	0.068** [0.029]	-0.002 [0.016]	-0.061** [0.027]	-0.025 [0.018]	0.003 [0.031]	0.01 [0.017]
Observations	5,334	5,334	5,334	5,334	5,334	5,334
R-squared	0.04	0.07	0.10	0.03	0.12	0.04
Industry, Year and State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Round Number Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
VC Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 7 continued

Panel B: Sample Includes Lead VCs only

Specification	1	2	3	4	5	6
Dependent Variable	Participation	Liq. Pref. Above 1X	Dividend	Anti-Dil. Full Ratch.	Seniority	Forfeiture
Lower or Unchanged Valuation	0.054* [0.031]	0.040** [0.017]	0.023 [0.028]	0.065*** [0.020]	0.213*** [0.032]	0.063*** [0.019]
Company Age (years)	-0.002 [0.004]	0.003 [0.002]	0.000 [0.004]	0.006** [0.003]	0.007* [0.004]	0.003 [0.003]
Early Stage	-0.051 [0.046]	0.011 [0.026]	-0.037 [0.041]	-0.049* [0.029]	-0.054 [0.047]	-0.009 [0.028]
Serial Founder	-0.04 [0.065]	0.004 [0.036]	-0.130** [0.059]	0.092** [0.042]	0.031 [0.067]	0.035 [0.039]
Serial Successful Founder with IPO	-0.028 [0.044]	-0.009 [0.025]	0.001 [0.040]	0.02 [0.028]	-0.175*** [0.046]	-0.043 [0.027]
Serial Successful Founder with Merger	0.049 [0.059]	-0.011 [0.033]	-0.023 [0.054]	0.009 [0.038]	0.028 [0.061]	0.063* [0.036]
Observations	1,587	1,587	1,587	1,587	1,587	1,587
R-squared	0.04	0.05	0.08	0.04	0.14	0.05
Industry, Year and State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Round Number Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Lead VC Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 8 - Relation between Cash Flow Rights and Change in Company Valuation, Separating Rounds with Lower and Unchanged Valuation

See Table 1 for sample overview, and Table 2 for details on the Cash Flow Rights. One observation is one financing round. All dependent variables are defined in Tables 4 and 6. Lower Valuation is a "down-round", and Unchanged Valuation is a "flat round". All specifications are probit and report marginal effects (dP/dX). All other variables are defined in previous tables. Standard errors are clustered by company and reported in brackets. Significance at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Specification	1	2	3	4	5	6
Dependent Variable	Participation	Liq. Pref. Above 1X	Dividend	Anti-Dil. Full Ratch.	Seniority	Forfeiture
Lower Valuation	0.074** [0.032]	0.062*** [0.022]	0.036 [0.035]	0.031 [0.020]	0.283*** [0.036]	0.063*** [0.020]
Unchanged Valuation	0.119*** [0.040]	0.106*** [0.034]	0.041 [0.048]	0.126*** [0.038]	0.232*** [0.049]	0.035 [0.023]
Company Age (years)	0.000 [0.004]	0.000 [0.002]	0.005 [0.004]	0.005*** [0.002]	0.011** [0.005]	0.002* [0.001]
Early Stage	-0.014 [0.043]	-0.013 [0.025]	0.036 [0.044]	0.033 [0.029]	-0.267*** [0.037]	-0.024 [0.015]
Serial Founder	-0.03 [0.051]	-0.025* [0.015]	-0.015 [0.046]	-0.033* [0.020]	-0.008 [0.047]	0.011 [0.019]
Serial Successful Founder with IPO	-0.072 [0.072]	0.071 [0.044]	-0.119** [0.057]	0.072 [0.056]	-0.058 [0.069]	0.006 [0.028]
Serial Successful Founder with Merger	0.072 [0.058]	0.004 [0.027]	-0.051 [0.061]	-0.019 [0.029]	0.013 [0.064]	0.021 [0.027]
Observations	1,587	1,587	1,587	1,587	1,587	1,587
R-squared	0.06	0.14	0.18	0.10	0.13	0.09
Industry, Year and State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Round Number Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 9 - Other Contract Terms

Panel A describes the distribution of pay-to-play and redemption rights provisions, as well as board seats, in our sample and their coding. In Contracts, one observation is a one contract (one financing round, N=1,587). In Sequential Contracts, one observation is a one contract for which we also have data on the contract from the previous round (N=227).

Panel A: Descriptions and Frequency Distributions

Pay-To-Play

Pay-to-play provisions specify what contractual rights that the investor loses if he does not invest in a follow-up financing round of the company. With "Convert to Preferred" the investor loses some contractual rights that are attached to his preferred stock. With "Convert to Common" the investor loses all contractual rights that are attached to his preferred stock.

	<u>No Conversion</u>	<u>Convert to Pref.</u>	<u>Convert to Common</u>	<u>No Pay-to-Play Indicator</u>
Contracts	1,288	82	217	81%
Percent	81%	5%	14%	
	<u>Change to Stronger</u>	<u>Unchanged</u>	<u>Change to Weaker</u>	
Sequential Contracts	13	199	13	
Percent	6%	88%	6%	

Redemption

The investor has the right to sell his shares back to the company after a specified time period. A typical redemption right provision gives the investor the right to sell back 1/3 of his shares after 5 years, 1/3 after 6 years and the 1/3 after 7 years.

	<u>Included</u>	<u>Not Included</u>	<u>Redemption Indicator</u>
Contracts	900	687	57%
Percent	57%	43%	
	<u>Change to Stronger</u>	<u>Unchanged</u>	<u>Change to Weaker</u>
Sequential Contracts	6	218	3
Percent	3%	97%	1%

Board Seat

The investor receives a seat on the board of directors. Because Venture Economics does not reveal in which round the board seat is given (in situations where the same VC invests in several round), we limit the sample to cases where the VC did not invest in previous rounds.

	<u>Included</u>	<u>Not Included</u>	<u>VC Board Seat Indicator</u>
Any VC in Contract Round (N=1,410)	401	1,009	28%
Percent	28%	72%	

Table 9, continued

Panel B - Relation between Pay-to-Play, Redemption Rights, and Board Seats and Change in Company Valuation

See Table 1 for sample overview. One observation is one financing round. In specifications 1-2, the dependent variable is an indicator variable equal to 1 if the financing round contract does not include pay-to-play, and 0 otherwise. In specifications 3-4, the dependent variable is an indicator variable equal to 1 if the financing round contract includes a redemption right. In specifications 5-6, the dependent variable is an indicator variable equal to 1 if the lead VC holds a board seat in the company. Because we cannot observe the timing of board seats we restrict the sample to VCs that invested for the first time in the company to ensure that the VC did not take her seat in a prior round. All specifications are probit reporting marginal effects (dP/dX). All other variables are defined in previous tables. Standard errors are clustered by company and reported in brackets. Significance at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Specification	1	2	3	4	5	6
Dependent Variable	No Pay-to-Play		Redemption		VC Takes Board Seat	
Lower or Unchanged Valuation	-0.092*** [0.027]	-0.090*** [0.027]	0.000 [0.034]	-0.004 [0.034]	0.046 [0.037]	0.052 [0.039]
Company Age (years)	0.011*** [0.004]	0.011*** [0.004]	0.002 [0.005]	0.000 [0.005]	-0.007 [0.005]	-0.006 [0.005]
Early Stage	-0.018 [0.035]	-0.028 [0.036]	-0.074 [0.048]	-0.088* [0.049]	0.051 [0.053]	0.037 [0.054]
Serial Founder	0.062* [0.033]	0.058* [0.033]	0.041 [0.050]	0.035 [0.050]	0.008 [0.057]	0.024 [0.057]
Serial Successful Founder with IPO	-0.141* [0.075]	-0.130* [0.073]	-0.017 [0.074]	-0.002 [0.075]	-0.134** [0.058]	-0.154*** [0.053]
Serial Successful Founder with Merger	-0.019 [0.052]	-0.022 [0.052]	0.000 [0.067]	0.007 [0.067]	0.021 [0.071]	0.014 [0.069]
VC Experience		-0.024** [0.010]		-0.049*** [0.016]		0.074*** [0.013]
Observations	1,587	1,587	1,587	1,587	1,254	1,254
R-squared	0.08	0.10	0.15	0.16	0.04	0.13
Industry, Year and State Controls	Yes	Yes	Yes	Yes	Yes	Yes
Round Number Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Lead VC Controls	No	Yes	No	Yes	No	Yes