

THE UNIVERSITY OF TEXAS SCHOOL OF LAW

Law and Economics Working Paper No. 034
October 2004



Unlocking Firms' Capital:
Default Penalties and Walkaway Options
in Venture Capital Partnership Agreements

Kate Litvak

The University of Texas School of Law

This paper can be downloaded without charge from the
Social Science Research Network Electronic Paper Collection:
<http://ssrn.com/index.html>

An index to the working papers in
The University of Texas School of Law Working Paper Series
is located at <http://www.utexas.edu/law/>

Unlocking Firms' Capital: Default Penalties and Walkaway Options in Venture Capital Partnership Agreements

Kate Litvak*

ABSTRACT

Several recent theories suggested that locking equity capital into a firm is highly desirable: a firm whose capital can be easily withdrawn by investors or their creditors is vulnerable to liquidity shocks and may experience difficulties finding lenders, contractual partners, and good employees. In this view, firms seek as much capital lock-in as the legal system allows, and a key historical development in organization law was to provide greater capital lock-in. I argue that these theories are incomplete. Capital lock-in leaves investors susceptible to opportunism by managers (agency costs) and controlling shareholders (self-dealing costs). I focus here on agency costs, and suggest that the optimal degree of capital lock-in is inversely related to the level of agency costs.

I test this "optimal capital lock-in" hypothesis through a study of the venture capital industry, which employs diverse and largely unregulated schemes of capital lock-in. I find that the degree to which investors are locked into venture capital partnerships is strongly and inversely related to several measures of expected agency costs. Larger venture funds (typically run by more prominent managers) and funds where managers receive higher overall compensation (typically higher quality managers) have tighter capital lock-in. Similarly, venture funds where managerial compensation is riskier and more heavily tilted toward performance-based component lock in their capital more tightly. This evidence is consistent with optimal capital lock-in depending on governance concerns. Proxies for a venture fund's need for liquidity, in contrast, only weakly affect the degree of capital lock-in. I find no evidence of a universal drive to maximize capital lock-in. Finally, I find no evidence that "lock-in" provisions are boilerplate decided by lawyers: different fund families, represented by the same law firm, use different provisions.

* Assistant Professor, University of Texas Law School. I thank Bernie Black, Brian Cheffins, Victor Fleischer, Mark Gergen, Michael Klausner, Ronald Mann, Larry Sager, Charlie Silver, Jay Westbrook, and participants in the annual meeting of the Canadian Law and Economics Association for comments. I especially thank the venture capitalists, venture capital lawyers, and representatives of institutional investors who were willing to answer my questions and in some cases provide the limited partnership agreements that are the focus of this Article. Those who have given me permission to name them include: Alan Austin at Silverlake Partners; Micah Avni at Jerusalem Global Ventures; Johnatan Axelrad at Wilson, Sonsini, Goodrich & Rosati; Craig Dauchy at Cooley, Godward; Ken DeAngelis at Austin Ventures; Andrei Manoliu; Mark Tanoury at Cooley, Godward; Susan Woodward at Sand Hill Econometrics. All errors are, of course, mine.

Introduction

How valuable is a firm's ability to "lock in" its assets – that is, to shield its assets from a firm's investors and investors' creditors? Very valuable, argue some. A firm whose assets can be easily withdrawn by investors (or investors' creditors) will have difficulty attracting investors, creditors and contractual partners.¹ Doing business with such a firm is expensive: one would have to investigate not only the financial state of the firm, but also the current and expected future financial state of its investors, as well as investors' proclivities for moving their money around, and discount for the risk that the firm won't be around in the future. These costs will be borne by the unlocked-capital firm itself through a higher cost of capital, foregone business opportunities, vulnerability to liquidity shocks, trouble attracting employees or persuading them to invest in firm-specific human capital,² and transaction costs to replace withdrawn capital.

Indeed, the capital of many modern firms is locked in: for example, modern corporations typically issue nonredeemable common stock, thereby ensuring that shareholders do not withdraw capital. Common shareholders who want to cash out their ownership rights must sell their interest to someone else, which does not affect a company's assets directly. Creditors of shareholders can do no more than shareholders themselves – they have no right to strip a corporation of assets should a shareholder declare bankruptcy.

These considerations gave rise to several popular theories arguing that capital lock-in is fundamentally a good thing, and firms do and should seek as much of it as the legal regime allows.³ In this view, a key historical development in organization law was to provide greater capital lock-in, and "just as we have seen a trend toward allowing other business forms to adopt such typically corporate characteristics as limited liability or centralized management, we can expect to see business law move (perhaps more slowly) toward allowing other forms to adopt greater capital lock-in."⁴ Some scholars draw strong policy prescriptions from these theories, ranging from the optimal allocation of control between shareholders and boards to rules governing takeovers.⁵ The main testable prediction of these "maximum lock-in" theories is that capital lock-in schemes should be fairly uniform across industries and firms, and any variation should be attributable primarily to legal restrictions on capital lock-in.

¹ See Henry Hansmann, Reinier Kraakman, and Richard Squire, *Legal Entities, Asset Partitioning, and the Evolution of Organizations* (working paper, 2004); see also Henry Hansmann and Reinier Kraakman, *The Essential Role of Organization Law*, 110 *Yale L. J.* 387 (2000).

² See Margaret Blair, *Locking in Capital: What Corporate Law Achieved for Business Organizers in the 19th Century*, 51 *UCLA L. Rev.* 387 (2003); Margaret Blair and Lynn Stout, *A Tem Production Theory of Corporate Law*, 85 *Va. L. Rev.* 247 (1999);

³ See Hansmann, Kraakman, and Squire, *supra* n.1; Blair, *supra* n. 2.

⁴ Lynn Stout, *On the Nature of Corporations*, *U. ILL. L. REV.* (2004) (available on SSRN at <http://ssrn.com/abstract=567803>)

⁵ See Margaret Blair, *Reforming Corporate Governance: What History Can Teach Us*, *Berkeley Bus. L. J.* (2003), available on SSRN at <http://papers.ssrn.com/abstract=485663>, see also Stout, *id.*

This prediction, however, has little empirical support. Once we move beyond the limited world of the traditional public corporation, we see a variety of contractual and organizational arrangements that allow a wide range of capital lock-in.

One familiar case of capital “unlocking,” which I will call “open-end unlocking,” is an arrangement where investors contribute the entire equity capital upfront but receive the right to withdraw capital from a company at some later point. In some settings, such as open-end mutual funds, capital withdrawals are allowed at any time; in other settings, like hedge funds, withdrawals are limited to annual or quarterly withdrawal windows.

No government regulation forces fund managers to introduce and maintain open-end, rather than closed-end, mutual and hedge funds. And yet, funds do not lock-in their capital to the maximum permissible degree: to the contrary, the overwhelming majority of funds are open-ended, and withdrawal terms vary widely across funds. Moreover, despite the suggested benefits of locked-in capital, closed-end funds typically trade at a discount to their asset value. Worse yet, when a closed-end mutual fund converts into an open-end form, it usually experiences an increase in share prices – a phenomenon that has created an “open-up” takeover market. Evidently, “unlocking” a firm’s capital may create value.

One may object that mutual funds and hedge funds are unique in that “unlocking” a financial firm does not create the same liquidity and incentives problems. This is incorrect: both theory and evidence suggest that investor ability to withdraw money on demand is expensive⁶ and hinders performance of open-end funds.⁷ The open-end form exposes arbitrageurs to the risk of investor flight if short-term performance is unsatisfactory. As a result, managers of open-end funds tend to avoid trades that are attractive in the long term, but are unlikely to converge with fundamentals smoothly or quickly.⁸ Because of their open-end form, funds “stick primarily to short-horizon strategies, and earn low excess returns. In so doing, they ... leave large long-horizon mispricings ... mostly untouched, because attacking such mispricings aggressively would require a closed-end structure.”⁹ The fear of investor flight has been blamed for undermining arbitrage and for preventing fund managers from betting heavily against the internet bubble in the late 1990s.¹⁰

This list of problems – liquidity shocks, short-termism, perverse incentives to manipulate performance indicators, etc. – is very similar to the list suggested by Hansmann et al., Blair, and Stout for firms with “unlocked” capital. Thus, there must be another side – benefits from allowing investor withdrawal that, at least in some settings, outweigh these costs.

⁶ See Roger Edelen, *Investor Flows and the Assured Performance of Open-End Mutual Funds* (working paper, The Wharton School, University of Pennsylvania, 1998) (documenting a statistically significant negative relation between a fund’s abnormal return and investor flows).

⁷ See Jeremy Stein, *Why Are most Funds Open-End? Competition and the Limits of Arbitrage* (Harvard University and NBER Working Paper, 2003).

⁸ See Andrei Shleifer and Robert Vishny, *The Limits of Arbitrage*, 52 *J. Fin.* 35 (1997) (showing that open-end arbitrageurs are not able to attack mispricings because they want to avoid forced liquidation of their positions).

⁹ See Stein, *supra* n.6.

¹⁰ See Markus Brunnermeier and Stefan Nagel, *Hedge Funds and the Technology Bubble*, 59 *J. Fin.* 2013 (2004)

Another popular way to “unlock” a firm’s capital is staged investment, which I will call “open-start unlocking.” Fundamentally, staged investment in a company that has a predictable need for more capital and will have difficulty raising capital elsewhere if an early investor walks away functions in ways similar to capital withdrawals from an established company. Indeed, an investor’s call position (the right to provide additional funds in return for additional shares) can be alternatively described as having fully invested in the investee company upfront plus owning a put option that allows retrieval of the yet-unpaid capital.

Here too, the hardships generated by staged investment are precisely those cited by Hansmann et al., Blair, and Stout for companies with unlocked capital: greater risk of liquidity shocks and bankruptcy, higher information costs, difficulty in attracting qualified labor and good contractual partners, perverse incentives for the management to manipulate performance indicators, and so forth. Despite these well-known costs, staged financing is ubiquitous in a number of settings, including venture capital and leveraged buyout funds. Here too, the unlocking of capital must bring enough value to outweigh the losses it generates.

Most fields of private equity use some version of capital unlocking. Hedge funds and most mutual funds typically use “open-end unlocking.” Venture and LBO funds, real estate development partnerships, and oil and gas partnerships use “open-start unlocking.” In each of these cases, investors receive put rights that they can exercise if dissatisfied with the performance of fund managers. These puts are structured differently in different industries, but the general pattern cuts across most fields of private equity: investors get important put rights.

In sum, modern firms may be much less eager to lock in their capital than we often believe. Rather than locking in as much capital as the legal regime allows, firms often pick-and-choose within a wide variety of lock-in regimes.

This paper seeks to understand the considerations going into a firm’s capital-lock-in decision, and then to empirically test these considerations. I suggest that while capital lock-in has the benefits discussed by the “maximum lock-in” theorists, it also has significant drawbacks. First, managers who sit on a stable pool of assets may not work very hard (agency costs).¹¹ Second, locked-in capital increases the risk of exploitation of minority investors by the majority (self-dealing costs). Granting dissatisfied investors the right to withdraw capital reduces both costs, which in some settings may be more valuable than ensuring a firm’s liquidity, reducing information costs, or fostering team production. In other words, capital lock-in, which protects a firm’s liquidity, is in tension with a firm’s governance. Other things equal, the tighter investors are locked into a company, the less control they can exercise over the management.¹²

Both the “maximum lock-in” theory and the “governance-liquidity tradeoff” theory are testable. If it is always optimal for firms to have as much capital lock-in as the legal regime allows, we should see firms choosing organizational forms and contractual

¹¹ A version of this idea was behind Jensen’s famous call to deplete corporations of large cushions of cash. See Michael Jensen, *Eclipse of the Public Corporation*, 67 *Harv. Bus. Rev.* 61 (1989). Jensen stopped short, however, of suggesting that shares should be puttable on demand.

¹² Likewise, as lock in gets tighter, the risks of minority exploitation by controlling investors increases. In this paper, I will concentrate on the managerial agency costs, but many arguments work for self-dealing costs as well.

arrangements that maximize capital lock-in. On the other hand, if capital lock-in is in tension with governance, firms should be more likely to “unlock” their capital (that is, to allow withdrawals of equity capital by investors) when (a) a firm’s agency costs increase, and (b) a firm’s risks of liquidity shocks decline.¹³

I test these and other related hypotheses by studying lock-in choices of venture capital funds. When investors join a particular venture fund, they do not hand over the entire amount of committed capital at once. Instead, they sign a contract promising to supply capital in stages over a number of years, retaining the real option to default on their commitment obligations. As discussed above, investors’ call position in a venture fund is equivalent to having fully invested upfront and retaining a put option on the amount on yet-unpaid capital.

Two important features of venture fund contracts make it possible to estimate the degree of a fund’s capital lock-in. First, venture fund partnership agreements not only allow investors to invest in stages, but expressly limit the portion of committed capital that a venture capitalist (“VC”) can call annually as well as the purposes for which capital calls can be made. Typically, investors get two to five years before the VC can receive the entire committed amount; in other words, a part of a fund’s capital is “unlocked” for up to half of a fund’s typical 10-year life. This walkaway period varies across venture funds, suggesting that some funds are more willing to permit capital withdrawals than others. The length of the walkaway period gives us the term of the investors’ put option and provides one proxy for the degree of a fund’s capital lock-in.

Second, to induce investors to honor their commitment obligations, venture funds employ a complicated system of default penalties: an investor who fails to contribute capital on time suffers a financial penalty, usually collectable without litigation by transferring some part of a defaulter’s capital account to non-defaulting investors. Default penalties vary widely across funds, ranging from relatively modest to severe; they affect the amount that investors receive if they default (exercise their put option) and therefore give us another proxy for the degree of a fund’s capital lock-in.

I study partnership agreements of 38 venture capital funds raised by 18 U.S.-based venture capital firms between 1987 and 2003. I code the severity of default penalties on a scale from 1 (least severe) to 10 (most severe). I define the term of a walkaway option as equal to $100/(\text{maximum percent of capital commitment that VCs can call per year})$. I then ask whether the severity of the default penalty and the term of the walkaway option are predicted by factors that proxy for the fund’s need for governance and liquidity: VC quality (fund size, fund number, and overall level of VC compensation); riskiness of VC compensation (the relative and absolute size of carry and management fee); outside world conditions (the year when the fund was raised and the hotness of the venture capital market during that “vintage” year); alternative ways to address liquidity concerns (the fund’s ability to borrow); and other performance incentives employed by the fund (minimum mandatory coinvestment by the VC in the fund).

I find significant support for the “governance-liquidity-tradeoff” hypothesis. Controlling for other things, funds where VCs receive higher total compensation (usually higher-quality VCs, or at least perceived by the market as such) and funds where VC

¹³ Firms with a high risk of self-dealing by insiders should also have less capital lock-in, but I cannot test this hypothesis with my data set.

compensation is riskier lock in capital more tightly by shortening the time periods during which investor walkaway is permitted. Also controlling for other things, larger funds (typically run by better VCs) lock in capital more tightly by using higher default penalties. Thus, on the whole, funds that confront lesser agency problems give investors a weaker governance tool in the form of walkaway rights.

A caveat: my sample size is small and not random. Partnership agreements are private, carefully guarded documents. My sample contains only agreements that were voluntarily provided to me by venture capitalists and investors.

This Article proceeds as follows. Part II discusses the installment system of capital contributions used in venture funds, as well as my coding of default penalties and option terms. Part III frames my hypothesis that the optimal level of capital stability in venture funds depends on balancing of governance and liquidity concerns, and specifies plausible factors that are testable using my dataset. It also discusses alternative testable hypotheses. Part IV describes the data and variables. Part V contains regressions and explains which hypotheses receive support in the data. Finally, in Part VI, I address the “real world” questions. Is the walkaway option given to venture fund investors long enough to play a real governance role? Do investors actually exercise walkaway rights? Are investor defaults triggered by governance considerations? Do defaults threaten funds’ liquidity? Do industry participants view default penalties as a useful tool to manage investor defaults? The Conclusion summarizes my findings.

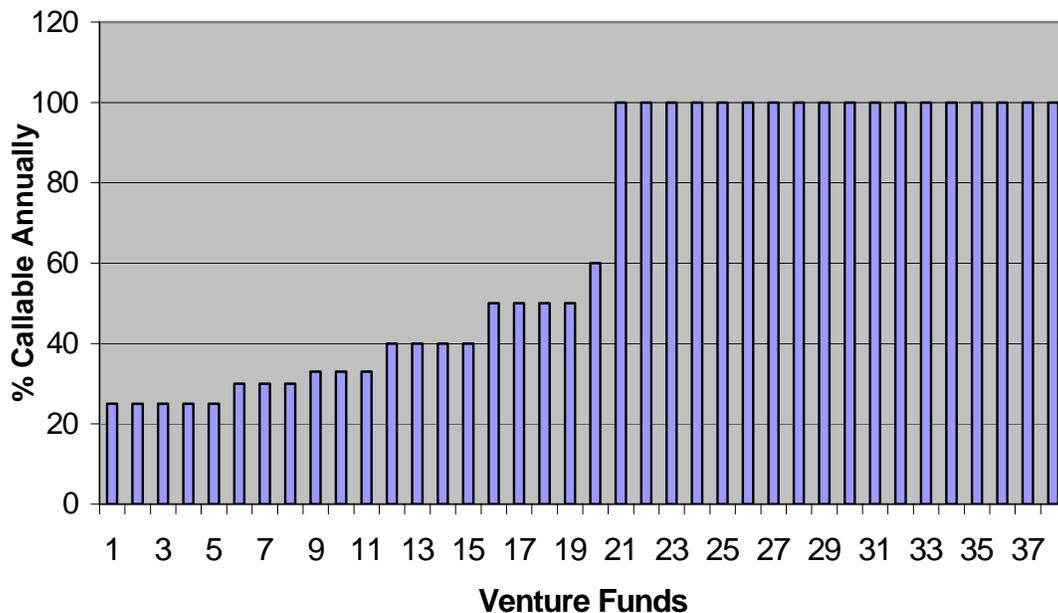
Part II: The Installment System of Capital Contributions

A. Timing of Capital Contributions

A typical partnership agreement requires each investor to contribute only a small portion of committed capital (usually between 5% to 15%) shortly before the fund is ready to make its first investment in the first portfolio company. The remaining amount is contributed in installments over a several-year period, as needed for discrete investments. Although the exact time and amount of each installment are determined by the VC, the VC’s discretion is limited by two provisions. First, about half of the agreements in my sample contain numerical caps on annual capital contributions, between 25% and 60% of committed capital.¹⁴ These provisions prohibit a VC from requesting contributions in excess of the cap amount. Figure A below summarizes caps on annual contributions found in my agreements. Here, agreements that do not contain formal caps are coded as having 100% caps.

¹⁴ Most agreements also limit VCs’ ability to *delay* capital calls. One popular arrangement is the “use it or lose it” provision, which provides that investors are not required to make capital contributions after a certain date (usually between the 4th and the 7th anniversary of the fund’s formation). This rule ensures that the fund does not pick up new projects so late in its life that they are unlikely be completed by the time of the fund’s scheduled liquidation. This provision often works together with an explicit prohibition on investing into new companies after a certain date. In addition, many agreements specify a *minimum* capital call—usually between 5% and 15% of committed capital—presumably to reduce the nuisance to investors.

Figure A: Max % of Committed Capital Callable Annually, by VC Fund



The second relevant provision requires that VCs call only as much capital as they can promptly invest.¹⁵ This provision seems to be universal—while only half of my agreements contain a numeric cap on annual contributions, all agreements contained a “call-to-invest” provision.

Despite its seeming fuzziness, the “call-to-invest” requirement has real teeth. It usually takes several years for VCs to find suitable investment opportunities for the entire amount of committed capital. As a result, the “call-to-invest” provision ensures that investors get a few years to decide whether they want to invest the entire committed amount. To be sure, VCs virtually single-handedly determine which investments are suitable for the fund; therefore, unless restricted by a numeric cap, VCs can accelerate capital contributions by choosing to invest quickly. However, few VCs would be willing to rush to invest (by cutting the normal investigative stage short and therefore jeopardizing fund’s profitability) for the sole purpose of accelerating capital contributions. Thus, in real life the “call-to-invest” provision is equivalent to granting investors at least two years to make up their minds (often, substantially longer). A conservative estimate of this provision’s bite would be treating it as a 60% cap on annual calls.

The combination of these two provisions gives us a measure of the term of the investor walkaway option. Since all funds in my sample have a “call-to-invest” provision, I treat all funds as having at least a 60% cap on annual calls.¹⁶ Because

¹⁵ Agreements that specify the *minimum* size of capital calls are unclear on what should happen if the specified minimum is higher than the amount that a VC can immediately invest. Presumably, in those cases, investors will waive one of the restrictions.

¹⁶ As a robustness check, I re-ran all regressions treating funds without numerical caps as having a 50% cap; the results remained very similar.

specific numeric caps are lower than the general “call-to-invest” cap, I assign all funds that have specific numeric caps the time restriction of the cap.

B. The Use of Default Penalties

Because the installment practice is virtually universal, fund agreements must specify the penalty for the investor’s failure to contribute capital on time. Penalty clauses are often written as long laundry lists of various punishments, ranging from relatively mild (such as charging interest on delayed contributions) to severe (such as forfeiture of the defaulter’s entire stake in the fund). The VC typically retains the right to pick an appropriate penalty from the list.

The availability of multiple penalties serves several functions. First, it allows VCs to penalize repeat offenders more severely than those who defaulted for reasons outside their control. It also allows VCs to treat some defaulters (largest, most prestigious, or most loyal investors) more favorably than others. Finally, it allows VCs to gradually tighten the grip on defaulters’ necks to pressure them to cure shortfalls. In my interviews, practitioners commented that VCs in effect use the list of penalties as a high-interest “meter”—instead of slapping a defaulter with the biggest available penalty outright (which would destroy incentives to cure the default), VCs start with a small penalty and then increase it to force a contribution.

Since investors eventually learn about other limited partners’ defaults and about the penalties imposed on defaulters, the penalty has a power to affect future defaults. As discussed in Part II, industry participants are aware that choosing a low penalty may trigger a “race to exit.”

It is not clear whether investors can in practice base their decisions to answer a capital call on the behavior of other investors. Investors surely can and do communicate with each other before honoring a questionable capital call; investors often use their collective power to negotiate with VCs behind the scenes. A less obvious issue is whether investors also engage in complicated games against each other, where, under some conditions, individual investors may be better off defaulting first (the “run on the bank” fear, expressed by some VCs), and under other conditions, investors may be better off remaining the last man standing (because the remaining investors typically receive some portions of defaulters’ accounts). Some provisions in partnership agreements create possibility for such complicated games. For example, all partnership agreements in my sample contain cure periods (usually about 10 days); therefore, in theory, a savvy investor may postpone making a contribution to learn whether other investors honored their commitments. However, as I understand, this gaming possibility has not been a real issue in the industry.

C. The Enforceability of Default Penalties

Since our contract law does not enforce penalty provisions, agreements usually contain some obligatory legalese, such as:

Parties agree that this is a fair and reasonable remedy in light of the fact that it is impractical to ascertain the actual damages that would be incurred by the Partnership and the non-defaulting Limited Partners as a result of a [defaulter's] failure to pay its capital commitment when due.

Another popular way to address the non-enforceability of penalties is to frame the default penalties explicitly as options held by the fund or non-defaulting investors. The following are examples of the options approach: “Until unpaid contribution and interest is paid fully . . . Partnership has an option, but not obligation, in sole discretion to acquire partnership interest of [defaulter] as following: [defaulter] is treated as optionor . . . Aggregate price for [defaulter's] interest is [description of the price]. The option is exercisable at any time within 30 days following 10 days after default.” Or: “should any defaulting Limited Partner fail to make any of the contributions . . . such Limited Partner shall be in default and the other Limited Partners (the “Optionees”) . . . shall have the right and option to acquire the Partnership interest of the defaulting Limited Partner (the “Optionor”) [at the described price].”

The use of organization law may also help avoid the enforceability problems generated by contract law. Delaware limited partnership law, for example, expressly allows harsh remedies to be enforced.¹⁷

I am not aware of challenges to legal enforceability of default penalties.

D. Types of Default Penalties

The severity of default penalties is one of the proxies for the ease of capital withdrawal. To study the relationship between default penalties and various fund characteristics, I need to code the severity of penalties. This coding is difficult for several reasons. First, the severity of each penalty depends on many factors: the amount that an investor contributed before the default; the fund's pre-default profitability; the amount of an investor's outstanding commitment; expected future profitability of the fund; overall state of the venture capital industry and the economy; investors' opportunity costs, and so forth. Any coding of default penalties is only a rough approximation of comparative harshness of each penalty. I rank penalties on the scale from 1 (least severe) to 10 (most severe).¹⁸ Table 2 contains a complete list of penalties found in the agreements with my judgment as to severity ranking. I will call these “default penalty coefficients.”

¹⁷ Delaware Revised Uniform Limited Partnership Act, 6 Del. Code Sec. 17-502(c) provides as follows: “A partnership agreement may provide that the interest of any partner who fails to make any contribution that he or she is obligated to make shall be subject to specified penalties for, or specified consequences of, such failure. Such penalty or consequence may take the form of reducing or eliminating the defaulting partner's proportionate interest in the limited partnership, subordinating the partnership interest to that of nondefaulting partners, a forced sale of his or her partnership interest, forfeiture of that partnership interest, the lending by other partners of the amount necessary to meet his or her commitment, a fixing of the value of that partnership interest by appraisal or by formula and redemption or sale of the partnership interest at such value, or other penalty or consequence.”

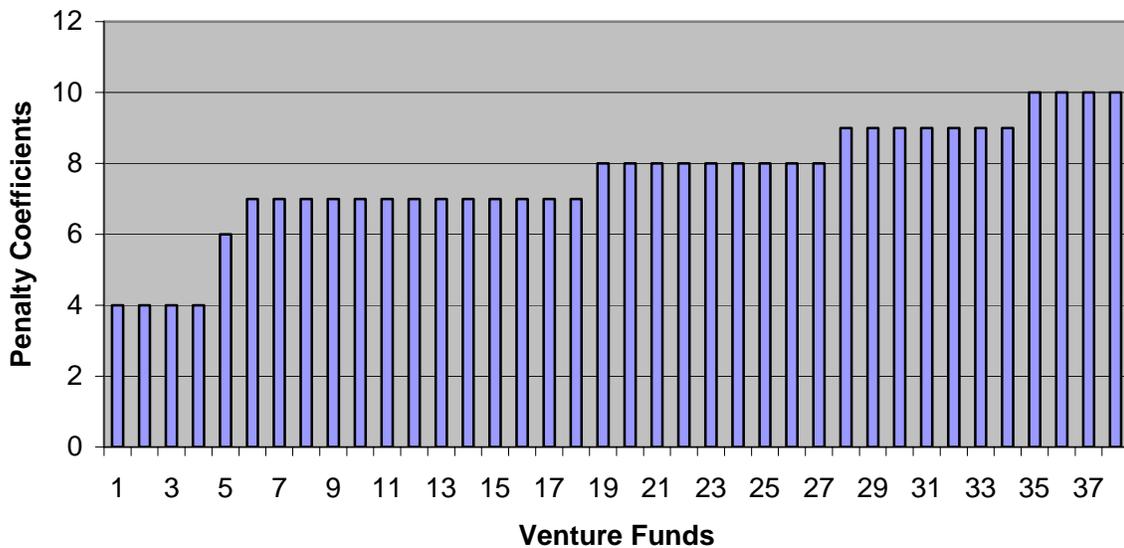
¹⁸ As a robustness check, I tried a cruder alternative ranking, on the scale from 1 to 3 (high penalty, medium, and low). Regression results remain very similar.

<< Table 2 Here >>

Another difficulty in coding is the fact that each agreement contains more than one penalty. It is hard to tell how investors assess the likelihood that a particular penalty will be used. I am not aware of any data on the actual use of penalties, and such information is very difficult to collect. Even if this information were available, its usefulness is not obvious: since penalties are deterrence devices, the fact that a particular VC has never used a certain severe penalty may simply suggest that the threat of a severe penalty had been strong enough to prevent defaults (or particularly egregious defaults) in the first place. Furthermore, the maximum penalty is probably the most important penalty listed in the agreement even if a default occurs and a VC chooses to settle with a defaulter for less than a maximum-penalty amount. In such cases, the size of the highest penalty likely influences parties' bargaining positions and therefore affects the final outcome.

Because the maximum penalty has these deterrence and framing effects, I determine the most severe penalty listed in each partnership agreement and assign the coefficient of that penalty to the fund. Figure B below summarizes default penalty coefficients found in my sample. As we see, maximum penalties are diverse.

Figure B: Default Penalty Coefficients



Part III: Variables and Hypotheses

A. Current Views on Staged Capital Contributions

Why do we see this elaborate staging practice, accompanied by an equally elaborate penalty system? Instead of spreading capital contributions over several years, fund participants could have agreed to a single payment of the entire amount at the outset of the fund's life. The unused portion of contributed capital could have been put in an escrow account and invested in liquid assets, with the interest going to limited partners. The escrow system would have eliminated the default risk and helped protect the fund from liquidity shocks. In fact, one very prestigious fund in my sample does exactly this, but restricts its escrow system to lesser-quality investors (individuals, institutions with assets of less than \$100M, and investors who have been in default earlier). These investors may be required, at the VC's discretion, to contribute up to 50% of their unsatisfied commitments to an escrow account, with interest allocated solely to a contributing investor. Why is this practice not more popular, and why is it not applied to all investors and to the full amount of capital commitments?

Although some practitioners clearly recognize the governance function of installment contributions,¹⁹ most industry insiders offer different accounts. The explanation most popular among practitioners is that staged contributions improve funds' internal rate of return (IRR). Calculations of a fund's returns are based on the capital that investors actually handed over to VCs, not the capital that they promised to hand over. Thus, a VC who takes more money than the fund can immediately invest, and keeps it in the fund's bank account, makes the fund's performance look less impressive.

This explanation is not satisfactory: if a fund required full capital contributions upfront, it could compute IRR based on invested capital only. In fact, many venture funds already have a procedure for separating returns from investments in portfolio companies from returns earned from investment of "idle funds"—money temporarily placed in liquid securities while the fund prepares to invest it into portfolio companies. This procedure has been used for years to ensure that VCs do not receive carry (and, often, a management fee) on the money that simply sits in a fund's bank account.

Moreover, the IRR-manipulation story does not explain why virtually every partnership agreement restricts capital calls to the amount that can be promptly invested, and why many agreements impose caps on annual contributions. Presumably, VCs care deeply about IRRs of their funds and would not take more money than they can invest if this depressed their performance indicators. In other words, the IRR-manipulation stories may explain why VCs *prefer* not to call more capital than absolutely necessary, but they don't explain why VCs need to be *required* to do so by partnership agreements.

One could think of a more complicated institutional story. Suppose a pension fund decides to allocate some of its assets to venture capital investments and expects higher rates of return over time, in exchange for higher risk. If a venture fund requires cash upfront and invests it temporarily, say, in S&P 500, then the IRR to the investor will be a blend of VC-return and S&P 500 return. The VC can explain this to investors and

¹⁹ See *infra* Part VI.

compute IRR based only on the venture investments. But then the manager of venture investments at the pension fund will have to carry this explanation up one level, to explain why his overall IRR is not a basis for judging his success in delivering above-market returns in exchange for taking above-market risk.

This institutional explanation is again not entirely satisfactory. VCs often announce capital calls on a short-term basis, and many agreements provide for only ten business days' notice. Thus, a manager of venture investments at a pension fund must keep enough money in highly liquid securities to satisfy capital calls on time. Such a pension fund must already have a procedure not to bundle, for performance evaluation purposes, the cash actually handed over to a VC with the cash allocated to a venture fund but parked in liquid securities. It is not clear why such a pension fund would have difficulty doing the same unbundling on the venture fund level. This story also does not explain the popularity of caps on callable capital.

Another twist on this argument suggests that the institutional investors who invest in venture capital can invest their committed but not-yet-called capital more effectively than VCs can. This view lacks empirical support in the finance literature. The available evidence strongly suggests that institutional investors have great difficulty finding positive net present value (NPV) investments, and are likely making zero NPV investments with their marginal dollars. Placing funds with VCs, until invested in portfolio companies, will produce the same zero NPV result. The institutions can use the rest of their portfolios to compensate for any difference in risk between the VC's investment choices and what they would otherwise choose.

Yet another possible explanation is investors' liquidity constraints. Some investors may not have the entire amount to invest upfront, and, for some reason (regulatory restrictions, taxes, or imperfect markets), they may be unable to borrow, or simply prefer not to borrow. This hypothesis is not very persuasive, either. Most venture dollars come from institutions; it is unlikely that institutions experience significant liquidity problems. Even if some do, one might expect to see some investors putting the entire amount upfront (perhaps on better terms) while others investing in stages (on worse terms to compensate for the risk). Alternatively, we could see large funds with top-quality investors having an upfront-contribution system, while smaller funds with individual investors having a staged-contribution system. We do not see such diversity.

Finally, practitioners sometimes mention explanations based on VC compensation schemes. For example, if carry is calculated as a percent of *all* of a fund's profits, then, the requirement of a single upfront contribution may mean that VCs will receive carry on the interest earned by money sitting in the fund's bank account before it's invested in portfolio companies. As mentioned before, this problem is easily fixed by calculating carry on the basis of venture investments, and many funds have been doing so for years. The same is true for worries about the management fee. Many funds calculate the management fee on the basis of committed capital; for those, the upfront payment system doesn't make any difference because the management fee is the same whether the capital is called or not. Funds that calculate the management fee on the basis of managed capital can easily avoid the problem of overcompensation by defining "managed capital" on the basis of venture investments, rather than on the basis of contributed capital.

B. An Options Approach to Staged Contribution

A more productive way of thinking about staged capital contributions is to treat staging as an option. By joining a venture fund, an investor acquires not only an interest in a fund, but also a valuable put option: during the first few years of a fund's life, a dissatisfied investor can put his interest (or a part of it, depending on the partnership agreement) back into a fund at a strike price of a value of relinquished interest minus default penalty.²⁰ In effect, the investor invests fully upfront, but retains an option to withdraw the unpaid portion of his capital commitments.

The option to walk away has multiple uses. One is insurance: the option helps protect investors from market risks associated with participation in a highly cyclical industry. This account, however, is incomplete without the mention of the agency costs and governance considerations: if VCs were perfectly loyal to investors, diversified venture investors would not need an insurance-driven option. Loyal VCs could collect the entire amount upfront and then return all uninvested money if a fund had no good use for it. The recent history suggests that agency costs make this use of a put option valuable. During the recent burst of the dot-com bubble, some VCs voluntarily cancelled new capital calls, but others made calls despite investor objections, faced defaults, and ended up negotiating default penalties with major investors.²¹

A second use for the investor put option is signaling: a high-quality VC who for some reason does not have verifiable quality indicators (e.g., a young venture firm with a short track record) may signal its quality by offering an easy walkaway regime (low penalty and longer option terms).

Third, the investor put option may provide screening: by imposing severe default penalties, VCs who strongly care about having timely access to capital can screen out investors who have private information about their own possible future liquidity shocks. In effect, default penalties may help separate investors into groups with roughly similar expected liquidities, which may be valuable for both VCs and investors. Although the investor liquidity problem could be solved by requiring less-liquid investors to invest all capital upfront, it may be difficult to tell *ex ante* which investor is less-liquid. By using severe default penalties, highly liquid investors can make their fund unattractive to less-liquid investors in the first place, thus making further investigations of liquidity unnecessary.

Finally, and perhaps most importantly, the threat of capital withdrawal is a powerful governance device that forces venture capitalists to perform better. This

²⁰ Alternatively, an investor's position can be described as a call option: by committing to pay a default penalty, an investor acquires the right to purchase a full interest in a fund later by supplying the remainder of his capital contribution.

²¹ One insurance rationale not involving agency costs is to protect investors from their own illiquidity caused by market downturns. If market conditions hinder an investor's ability to contribute more money but do not affect a fund's investment opportunities, loyal VCs would not have returned the unused portion of contributed but uninvested capital. This use of the put option is not efficient: diversified investors are in a better position of insuring themselves against illiquidity risks than a venture fund is. As discussed in Part II, practitioners seem to believe that a sizable part of recent defaults by individual investors (and most defaults by institutional investors) were due to investors believing the fund lacked good investment prospects, rather than investor illiquidity.

disciplining tool can be used only for the first few years of a fund's life because investors can withdraw their capital (by refusing to answer a capital call) only before the money is actually invested in portfolio companies. In effect, the threat of investor walkaway disciplines venture capitalists just as the threat of investor walkaway disciplines managers of open-end mutual funds.

However, as I mentioned before, using put options as a governance tool is expensive: when time is of the essence, a venture fund's liquidity may be crucial for its performance. Moreover, a fund with more liberal withdrawal policies imposes higher costs on potential business partners (coinvesting venture funds, entrepreneurs of portfolio companies, etc.), who will need to investigate more closely whether the fund will be able to collect the entire amount of committed capital. These costs will impact the fund's cost of capital. Therefore, an optimal walkaway option would reflect a tradeoff between governance and liquidity concerns.

C. Hypotheses

There are several plausible hypotheses about the relationships among fund characteristics, market conditions, and provisions specifying walkaway rights.

Hypothesis #1 (VC Quality – Governance). The quality of the venture capitalist *negatively* predicts the strength of investors' walkaway rights. Investing with high-quality VCs involves less uncertainty about VC performance, and thus less need to use the option to walk away as a governing tool. Therefore, larger, higher-numbered funds, and funds where a VC receives higher overall compensation should have higher default penalties and shorter option terms (higher caps on maximum callable capital).²²

Hypothesis #2 (VC Quality – Liquidity). The quality of the venture capitalist *positively* predicts the strength of investors' walkaway rights. Other things equal, larger funds have more investors or more large liquid investors who can pick up the slack in case of a default. Because of this cushion of potentially available assets, larger funds are less hurt by liquidity shocks and thus should have more liberal withdrawal policies: lower default penalties and longer option terms (lower maximum capital call annually). Similarly, other things equal, higher-numbered funds are usually run by more experienced VCs. Such VCs have more liquid existing investors and also have better access to outside investors if insiders cannot cover shortfalls in case of defaults. Thus, higher-numbered venture funds should have lower default penalties and longer option terms. Finally, VCs who receive higher overall compensation are perceived as higher-quality by the market and therefore may be in a better position to attract outside investors to cover funds' liquidity shocks. Therefore, funds run by VCs with higher total compensation should have lower default penalties and longer option terms.

Hypothesis #3 (VC Quality – Information Costs). The quality of the venture capitalist *positively* predicts the strength of investors' walkaway rights. Liberal walkaway rights increase the risk that a fund will not be able to collect the entire amount of committed capital and default on its financing obligations. This risk increases

²² Fund size and number are decent proxies for VC quality because better VCs tend to raise more funds, and their funds are larger. Total VC compensation can proxy for VC quality because it reflects the market's perception of the VC quality: better VCs get higher total compensation. See *infra* Part V.B.

information costs because entrepreneurs, potential syndicators, and other business partners of a fund with liberal walkaway rights must investigate both VCs and investors more carefully. Higher-quality, reputable VCs have likely been investigated in the past; they are also more likely to have higher-quality, liquid investors with a longer history of venture investing. Potential business partners dealing with such VCs incur lower information costs than those who deal with funds organized by no-name newcomers and financed by no-name investors of uncertain liquidity. Thus, default penalties should be lower and option terms longer when fund size is larger, fund number is higher, and the total VC compensation is higher. Predictions generated by this hypothesis are a subset of predictions generated by the liquidity hypothesis.²³

Hypothesis #4 (Investor Quality – Reputation). The quality of investors *positively* predicts the strength of investor walkaway rights. Higher-quality investors, who are admitted to oversubscribed funds and strive to remain on the preferred list of top VCs, are more concerned about their reputations than lower-quality investors, who do not plan to remain long-term players in the venture capital industry. Since defaults hurt investors' reputations, the same financial penalty will deter better, reputation-conscious investors more than lower-quality investors. Thus, other things equal, better funds, which tend to have better investors, should grant investors stronger walkaway rights. Larger and higher-numbered venture funds, as well as funds run by VCs with higher total compensation, should have lower default penalties and longer option terms. Predictions generated by this “investor-reputation” hypothesis are the same as predictions generated by the information-costs hypothesis, and are a subset of predictions generated by liquidity-based hypotheses.

Hypothesis #5 (Market Hotness – Both Liquidity and Governance). The hotness of the venture capital market (defined as either the log of total amount of money invested in the VC industry or the log of total number of VC deals during the fund's vintage year) predicts two things: (a) parties' views about the likelihood and severity of future liquidity shocks (Liquidity Hypothesis), and (b) parties' views on whether hot markets exacerbate agency problems (Governance Hypothesis).

On the liquidity side: when the VC market is hot, many funds are oversubscribed, VCs invest money more quickly, and the periods between raising successive funds in a series are shorter. In those times, it may be easier to find a replacement for a defaulting investor in the midstream of a fund's life, and thus the risk of liquidity shocks declines. Consequently, funds raised in “hot” years should have lower default penalties and longer option terms.

On the governance side: hot markets may exacerbate agency problems. In hot times, VCs often raise funds larger than they can carefully manage; when unused cash starts burning VCs' hands, they often invest in marginal portfolio companies. As a result, VCs' attention gets spread too thinly, undermining fund profitability. Investors may respond by demanding more liberal walkaway rights, in case VCs start acting unreasonably once a partnership agreement is signed. Thus, the governance hypothesis

²³ The liquidity hypothesis predicts the relationships between the investor walkaway regime, the quality of the VC, the hotness of venture capital markets, and provisions regulating alternative funding possibilities, such as the restrictions on borrowing. The information-costs hypothesis only predicts the relationships between the investor walkaway regime and the quality of the VC.

would also predict that funds raised in “hot” years should have lower default penalties and longer option terms.

Hypothesis #6 (Alternative Sources of Capital – Liquidity). Venture funds that can quickly raise capital through alternative means, such as short-term borrowing, are less susceptible to liquidity shocks, and thus should allow more liberal default policies.²⁴ Therefore, venture funds that allow VCs to borrow more should have lower default penalties and longer option terms, and be more likely to have cap-specifying provisions.

Hypothesis #7 (Riskiness of VC Compensation – Governance). VCs whose overall compensation packages contain a higher proportion of performance-based compensation have higher incentives to work hard, and thus need less oversight through the risk of investor withdrawal. Therefore, funds where carried interest²⁵ is lower and the management fee²⁶ is higher should have more liberal withdrawal policies—lower default penalties and longer option terms.

Hypothesis #8 (Minimum VC Coinvestment – Governance). Mandatory VC co-investment in the fund is another proxy for VCs’ interest in the fund’s profitability. A VC whose personal assets are exposed (in addition to his compensation) has more incentives to perform well and thus needs less pressure through the threat of withdrawal. Thus, funds that require higher VC co-investment should have higher penalties for default and shorter option terms.

Part IV. Data and Variables

A. Data

The sample consists of 38 venture fund agreements, raised by 18 venture capital firms. All funds are U.S.-based, and all specialize as venture capital. Agreements were obtained from institutional and individual investors, mostly on the West Coast. The use of all agreements is approved by VCs; therefore, the sample is not random. Supplemental information, such as the location and the age of a venture capital firm, is collected from a variety of other sources, such as firms’ websites and interviews with practitioners. Appendix Panel 1 reports summary statistics.

Venture funds and venture firms in the sample are diverse. Some venture firms are young organizations; others have been in business for decades. The sequence number

²⁴ Every agreement in my sample contained some provision governing fund-level borrowing; the provision is typically drafted as a cap on the amount that VCs can borrow. Contrary to an opinion popular in the academy, fund agreements do not restrict borrowing to reduce risk to investors. Borrowing restrictions are caused by tax considerations: tax-exempt investors will be taxed on any income that a fund earns from borrowed capital. Borrowed capital is simply more expensive for such investors than equity capital, and thus the decision to permit borrowing needs to balance a fund’s liquidity needs with investors’ desire to reduce their tax liabilities. Because borrowing is used primarily for liquidity needs, rather than as an ordinary form of capital-raising, most funds borrow only on a short-term basis.

²⁵ Risky portion of VC compensation, calculated as a percent of a fund’s profits.

²⁶ Nonrisky portion of VC compensation, calculated as a percent of a fund’s committed capital and paid regardless of fund’s performance.

of the funds—ranging from 1 to 11 (mean = 5.1)—indicates this diversity. The oldest venture firm was created in 1969; the youngest in 2002, with the mean year being 1985.

The data set contains mostly recent agreements. The oldest fund was raised in 1987, the most recent is 2003, with the mean being 1998. Fund size ranges between \$20M and \$1250M (mean = \$356M). Eighty-one percent of agreements come from California-based funds, which partly reflects the dominance of the West Coast venture firms in the industry and partly reflects the sources from which I obtained the agreements. Sixteen percent come from Massachusetts, and 3% (one fund) from Washington. About 17% of venture firms are registered as California firms (either LLCs or corporations); the rest are registered in Delaware.

The data set contains eighteen “families” of funds; each family is raised by the same venture capital firm. The number of funds per family ranges from 1 to 6 (mean = 2.2).

B. Variables

Penalty Coefficient. Each fund in the sample is assigned a penalty coefficient corresponding to the most severe default penalty listed in its agreement.

Option Term. The minimum number of years required to call the entire amount of committed capital. This variable is equal to $100/(\text{maximum percent of capital commitment callable per year})$. Because agreements that do not contain a specific numeric cap nevertheless restrict capital calls to amounts that can be promptly invested, I assume that those agreements have an effective cap of 60% per year.²⁷ Thus, the option term takes a minimum value of 1.66. Option term is one important measure of the term of the strength of investors’ walkaway rights. I obtain similar results if I use an alternative measure of the option term—the maximum percentage of fund’s capital callable per year, again capped at 60%.

Fund Number. Each venture fund has a sequence number that shows the total number of funds that a given venture capital firm has raised, including the current fund, but not including side-by-side funds and other funds raised as supplements to main funds. Fund number is a (imperfect) proxy for the quality of the venture capitalist because only good venture capitalists survive long enough to raise a large number of funds. The fund number variable is a better measure of quality when used in combination with the “year of venture firm formation” variable discussed below. Controlling for the year of venture firm formation, a firm that has raised more funds is likely to be of higher quality.

Because fund number strongly correlates with year of venture firm formation ($r = -0.82$), I regress fund number against the year of venture firm formation, and use the residuals from this regression as a “detrended” measure of fund number. All regressions

²⁷ This assumed minimum investment period is consistent with the minimum periods cited by industry insiders for a venture fund to invest all of its committed capital, and is also equal to the highest cap present in my agreements. In robustness checks, I find similar results when I assume that funds without numeric caps have a 50% cap.

in this paper use detrended fund number and control separately for the year of venture firm formation.²⁸

Year When Venture Firm was Formed. In my sample, option-setting provisions are "sticky" – they do not change across funds raised by the same venture firm. This contrasts with other provisions (such as management fee, carry, and fund size) that do change within a fund family. I assume that this pattern holds true for older firms (whose early funds are not included in my sample). I therefore use the year of venture firm formation to proxy for the year when the option-setting provision is drafted. This variable can control for a time trend in investor walkaway rights. Because I control separately for fund number, year of firm formation should not proxy very strongly for VC quality.

Fund Size. This variable is coded as the natural logarithm of fund size. Fund size is another proxy for VC quality because a VC's reputation determines investors' willingness to put their money into a particular fund.

Fund's Vintage Year. Fund's vintage year is the year when the fund was raised. This is one of my two variables that control for trends in drafting (the other is year of venture firm formation). As discussed above, default penalties and option terms do not change within fund families; therefore, the time trend for those provisions is controlled for by the "year of venture firm formation" variable. However, many other provisions (such as fund size, carry, and management fee) change within fund families and could have a separate time trend. I use the "vintage year" variable to control for that time trend.

Market Hotness. As a "raw" measure of market hotness, I use the natural logarithm of the total amount of dollars invested in the venture capital industry in the fund's vintage year. Because dollars invested in venture capital have a time trend, I regress this "raw" number against the fund's vintage year, and use the residuals from this regression as a "detrended" measure of market hotness. All regressions use detrended market hotness and control separately for vintage year. Market hotness is an important variable because industry participants may change their behavior depending on market conditions.²⁹

Carry. Carry, or carried interest, is a performance-based, risky portion of VC compensation. It is coded as a percentage of a fund's profits as specified in a partnership agreement.

Management Fee. The management fee is a non-risky portion of VC compensation, paid on a quarterly basis, typically a percentage of a fund's committed or invested capital. Because management fee provisions are drafted in many different ways, I use the net present value of management fees over a period of 11 years (the typical 10 year duration of a fund plus one extension year), as a percent of a fund's committed capital.³⁰

²⁸ As a robustness check, I also used "raw" (non-detrended) fund numbers in all regressions, with similar results.

²⁹ As a robustness check, I used the detrended log of total number of VC deals in a fund's vintage year instead of the detrended log of the total dollar amount, with similar results.

³⁰ For details and assumptions in calculations of management fee, see Kate Litvak, *Venture Capital Limited Partnership Agreements: Understanding Compensation Arrangements* (working paper, available on SSRN at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=555626).

Ratio of Carry to Management Fee. This coefficient shows the riskiness of a VC's total compensation. The higher the ratio, the riskier overall compensation is, holding constant the overall level of compensation.

Total VC Compensation. Total VC compensation level likely proxies for VC quality. Indeed, my research on VC compensation provides evidence that the overall level of VC compensation is strongly predicted by other measures of VC quality (fund number and fund size).³¹ To measure the combined level of VC compensation, from both carry and management fee, I normalize NPV of management fee and a carry percentage to a mean of zero and a standard deviation of one. The "total compensation" variable is the sum of these normalized values for each fund in my sample.

Borrowing Ceiling. This is the percent of a fund's committed capital that a VC can borrow without obtaining specific permission from investors. A higher "borrowing ceiling" variable means that the VC has more flexibility to borrow. A VC's ability to borrow is an important measure of a fund's susceptibility to liquidity shocks because borrowing allows a VC to cover shortfalls caused by investor default quickly.

Minimum VC Coinvestment. This is the percent of a fund's committed capital that a VC is required to invest in a fund. This variable is important because a VC who invested more personal assets in a fund has stronger incentives to perform and therefore may need lesser pressure to perform via investor threats to default. A higher value of this variable indicates a VC who is more burdened by the coinvestment requirement.

Fundraising Restriction. This is the percent of a fund's committed capital that must be invested before a VC is allowed to start raising a new fund. This variable may be important because it reflects a direct way in which investors may control VC performance during the critical early years when investors are deciding whether to hand over the entire committed capital to the fund. If a VC is not permitted to raise new funds early in a fund's life, he has fewer opportunities to misbehave during those years, which could reduce agency costs, and therefore investors' need for walkaway rights to ensure that a VC behaves properly. A higher value of this variable indicates a VC who is more controlled by the fundraising restriction.

Part V: Regressions Results

A. Default Penalties

A correlation table for the principal variables is presented in Table 3. Table 4 presents regression results for default penalties. All regressions are with venture firm fixed effects for firms with multiple funds.

<< Table 4 Here >>

Both in simple correlation and in all regressions, fund size correlates strongly and positively with default penalty. No other variable correlates significantly with default penalty

³¹ *Id.*

Turning to the hypotheses developed above, the correlation between severity of default penalty and fund size supports Hypothesis #1 (VC Quality—Governance). The opposite Hypothesis #2 (VC Quality—Liquidity), and the similar narrower hypotheses #3 and #4 (VC Quality—Information Costs and Investor Quality—Reputation) are rejected. Contrary to the predictions of Hypotheses #2, #3, and #4, VCs who run larger funds (presumably better, more liquid and more investigated VCs, who also likely deal with reputable, repeat-player, more investigated investors), do not employ less severe default penalties.

B. Option Terms

Table 5 presents regression results for option term (inverse of maximum annual call percentage). All regressions are with venture firm fixed effects. Year of venture firm formation, carry, management fee, the riskiness of VC compensation, total VC compensation, market hotness, and fundraising restrictions all predict option terms.

<< Table 5 Here >>

Turning to the hypotheses developed above: Hypothesis #1 (VC Quality – Governance) is partly supported. VCs who receive higher total compensation (and thus are likely of higher quality) grant investors shorter option terms. There is also a strong inverse relationship between year of venture firm formation and option term. This may simply indicate a drafting time trend.³² However, the time trend could be consistent with an industry-wide governance story. In early years of the venture capital industry’s existence, the uncertainty about VC performance was high, pushing up the governance value of longer option terms. As the industry matured, the uncertainty decreased, reducing the governance value of longer option terms and, consequently, making their use less attractive. As a result, venture firms formed in later years have shorter option terms in their agreements.³³

Hypotheses #2 (VC quality – liquidity), #3 (VC Quality – Information Costs), and #4 (Investor Quality – Reputation) are not supported.

Hypothesis #5 (Market Hotness – Liquidity and/or Governance) supported. Hotter VC markets predict longer option terms. This is consistent with both the governance and liquidity hypotheses.

Hypothesis #6 (Alternative Sources of Capital – Liquidity) is not supported. The amount that VC can borrow does not significantly correlate with option term.

³² As mentioned in Part V.B, option-setting provisions do not change across funds raised by the same venture firm. Since I also control for fund number, year of venture firm formation proxies for drafting time trend, but not for VC quality.

³³ A remaining question is why there is a strong trend to shorten options terms across first funds raised by newly-formed venture firms, but once an option term is put in place, it does not change in subsequent funds. This might be a contractual stickiness of the “if it ain’t broken, don’t fix it” kind: so long as an old agreement works well enough, the transaction costs of revising it for the next fund might be prohibitive. However, when fund participants have to draft a first agreement in the series, they apparently pay attention to provisions determining walkaway options.

Hypothesis #7 (Riskiness of VC Compensation – Governance) is strongly supported by the significant positive coefficients on carry and ratio of carry to management fee, and the significant negative coefficient on management fee (these are not independent results, of course). As VC compensation gets riskier, option term gets shorter.

Hypothesis #8 (VC Coinvestment – Governance) is not supported. VC co-investment does not predict option term.

To summarize: governance-based hypotheses fare better than liquidity-based alternatives. As total VC compensation gets riskier, option terms decline. That is, as VCs receive higher monetary incentives to perform, the use of investor walkaway option becomes less attractive. Likewise, VCs whose total compensation is higher (that is, VCs who are perceived by the market to be of higher quality) run funds offering shorter option periods.

The liquidity hypothesis is supported only where it is consistent with the governance hypothesis. There is no support for the information-costs or investor-reputation hypotheses.

C. The Role of Lawyers

Since default penalty and option term provisions do not change across funds of the same VC, one may wonder whether they are placed there by lawyers and go largely unnoticed by both VCs and investors. To investigate this possibility, I ask whether fund agreements written by the same law firm for different “families” of venture funds differ in their option-setting provisions. I find significant differences in both default penalties and option terms.

One major law firm in my sample has one “family” of venture funds with default penalty of 10 and an option term of 2 years (venture firm created in 1980), another “family” with default penalty of 10 and option term of 1.66 years (created in 1977), and a third “family” with default penalty of 9 and option term of 3.33 years (created in 1991). Another law firm has one “family” of venture funds with default penalty of 10 and option term 1.66 years (venture firm created in 1972), another with default penalty of 7 and option term of 1.66 years (created in 1970), and a third with default penalty of 8 and option term of 1.66 years (created in 1969). A third top law firm in my sample has one “family” of funds with default penalty of 8 and option term of 1.66 years (created in 1999), another “family” with penalty of 8 and option term of 3.33 years (created in 1986), and a third “family” with default penalty of 7 and option term of 2.5 years (created in 1979).

In sum, law firms do not blindly copy option-setting provisions across agreements of different clients. Even if the parties do not revisit option-setting provisions after the first fund agreement is drafted, someone evidently puts thought in those provisions at the outset.

D. Summary

Table 6 summarizes findings from Tables 4 and 5. It contains only statistically significant relationships.

We see that as the total VC compensation becomes riskier (more heavily tilted towards carry), walkaway becomes more difficult. This supports the governance hypothesis. Walkaway also becomes more difficult when the quality of the VC is higher: when funds get bigger and when total VC compensation is higher. This supports the governance hypothesis and rejects the liquidity, investor-reputation, and information-costs hypotheses. In addition, older venture firms make walkaways easier, when we control for fund size and number. This last finding may simply reflect a drafting trend, but to the extent it reflects anything more, it supports an industry-level governance hypothesis.

The positive relationship between fund size and the severity of penalties may have an alternative "bargaining power" explanation. The "bargaining power" explanation would suggest that better VCs, who run bigger funds, may be able to negotiate better terms across the board—including weaker investor walkaway rights. The same dual explanations apply to the negative relationship between total VC compensation and length of option term. On the regression results alone, I cannot distinguish between this "bargaining power" hypothesis and my governance hypothesis. However, some other considerations favor the governance hypothesis.

First, the "bargaining power" hypothesis doesn't explain the positive relationship between the riskiness of VC compensation and the harshness of the walkaway regime. Holding the quality of the VC constant, a fund where VC compensation is riskier gives investors weaker walkaway rights. The "bargaining power" hypothesis has a hard time reconciling these two trends: of two otherwise identical VCs with equal total compensation, the one whose compensation is riskier is probably more risk-acceptant. It is hard to explain why a *more* risk-acceptant VC would use his scarce resource (bargaining power) to get a *less* risky walkaway regime.

Second, for the "bargaining power" hypothesis to stand, it has to explain why better VCs prefer to take higher compensation in kind, via a harsher walkaway regime, rather than through higher in-cash compensation.

Third, apart from governance concerns, the basic premise for the "bargaining power" hypothesis (that VCs prefer a hard-walkaway regime while investors prefer an easy-walkaway regime) may be misguided. It is not obvious that investors prefer an easy-walkaway regime. Governance concerns aside, each investor would presumably prefer an easy-walkaway for itself and hard-walkaway for other investors. Since this arrangement is normally not available, some investors may prefer the hard-walkaway regime to ensure that their funds won't run out of cash.

Turning to the liquidity hypothesis: The only finding supporting it is the relationship between market hotness and the laxness of the walkaway regime. As investors pour more money into the VC industry, option terms increase, making walkaway more attractive. The liquidity explanation is that hotter markets increase funds' ability to find outside investors as substitutes for a defaulter, thereby reducing the risk of liquidity shocks. This relationship, however, is predicted by the governance hypothesis as well. In hot markets, the supply of qualified VCs does not match the

spiking demand for their services; as a result, hotter markets may exacerbate the agency problem, thereby increasing the need for longer option terms.

Another prediction of the liquidity hypothesis—that higher borrowing limits should correlate with more stringent walkaway regime—is not supported.

I find no support for the information-costs or investor-reputation hypotheses. To the extent VC quality predicts the strength of investor walkaway rights, it does so *negatively*, not positively.

Finally, the “boilerplate” hypothesis is not supported. Default penalties and option terms vary in economically sensible ways and are predictable based on governance factors. These provisions are not predicted by the VC's choice of law firm.

Not all results point in the direction of the governance-based hypotheses. Many results are statistically insignificant, which may reflect my small sample size. However, nearly all *significant* results support governance-based hypotheses.

Part VI: Questions From the Real World: The Reality of Investor Defaults

A. Is the Option Term Long Enough to Play a Governance Role?

It may seem that the two-to-five-year option term is too short to play a real governance role. In fact, however, two to five years can be a serious time in the fast-paced venture capital world, and important information is often released during that time.

First, the early years of a fund's life are often marked by realization of investments and liquidation of a VC's prior fund, which releases information about the venture capitalist's prior performance. Second, even early in a fund's life, investors start getting information about the performance of a current fund's earliest investments. Although a fund's investments at that time are usually illiquid, investors often can evaluate them by, for example, looking at the prices that new syndicators pay in follow-up financing rounds. Partnership agreements typically ensure that investors receive midstream performance information regularly; this disclosure is done precisely to allow investors to act on new information.

Third, during the first few years of a fund's life, investors receive information about the companies in which the funds are planning to invest. Most partnership agreements require VCs to supplement each capital call by detailed information about the target company.³⁴ This reduces the uncertainty about a fund's expected performance because at the time when a partnership agreement is signed, a fund is typically a blind pool of money.

In sum, important information about a VC's recent performance—returns of prior funds, performance of early investments, and the choice of particular investments—

³⁴ Some young funds (not in my sample) went even farther, requiring an approval of the majority of investors for each capital call.

becomes available after the partnership agreement is signed but before the fund is fully invested. The investor put option may be short relative to the ten-year life of the fund, but it can still be meaningful.

B. Do Investor Defaults Actually Happen?

Investor walkaway options would have little bite if investors were unable to exercise them because of reputation concerns, industry norms, or other considerations. To my knowledge, there is no data on the rates of investor defaults or their causes. Undoubtedly, reputation concerns affect investors' walkaway decisions and affect the rate of defaults. However, reputation and informal sanctions have not eliminated the default problem. The industry literature is full of default stories, and VC attorneys have developed standard procedures for dealing with defaulting investors.

When Joseph Bartlett, a famed VC attorney and author of numerous practitioner books, signed up to represent a disgruntled investor seeking a release from capital commitments, he commented that “there are a lot of cases like this and we just have to figure out a solution that doesn’t wind up in court.”³⁵ Another top VC attorney, Jonathan Axelrad, concurs: the rate of investor defaults during the post-dot-com period has been “unprecedented.”³⁶ Brett Buyers, managing director of a premier private equity firm specializing on secondary purchasing of venture capital investments commented that as of late 2000, investor defaults became an “issue ... of significance”: “hundreds (if not more) of limited partners have sought, during 2001 and 2002, to reduce their remaining capital commitments.”³⁷ In short, practitioners believe that defaults are common and take them very seriously.

One popular default penalty - forced sale of a defaulter’s interest – was apparently utilized enough to generate a business of its own. In many funds, if non-defaulting limited partners are not willing to acquire a defaulter’s interest (even at a substantial discount), a VC may facilitate the sale to a third party. “Amid the breakups, there’s big business in resolving venture defaults. Several firms, including Boston’s HarbourVest Partners and Landmark Partners of Simsbury, Conn., regularly acquire private equity positions from individuals and institutions seeking to leave a venture fund.”³⁸

Defaults have been enough of an issue to prompt attorneys to devise complex schemes to handle forced sales of *multiple* defaulting investors in the same fund:

[The forced sale penalty] may be problematic for both the limited partner in arrears and the general partner. If existing limited partners are uninterested in increasing their allocation to the fund, it is time-consuming and distractive to market a small partnership interest to secondary buyers. Further, because the due diligence necessary to value a private equity interest is the same regardless of the

³⁵ Vyvyan Tenorio, *The Deal* (07-15-2000), available on the website of the National Association of Seed and Venture Funds, <http://www.nasvf.org/web/allpress.nsf/pages/5896>.

³⁶ Amy Cortese, *Venture Capital, Withering and Dying*, *The New York Times* (Oct 21, 2001) (available at <http://www.zurichmednet.org/development/VentureCapitalWitheringAndDying.htm>)

³⁷ Brett Byers, *Secondary sales of private equity interests*, *Venture Capital Fund of America* (Feb 18, 2002), available at <http://www.altassets.com/casefor/sectors/2002/nz3269.php>.

³⁸ Beth Healy, *Caught Short: Cash-strapped Internet entrepreneurs are forced to quit venture funds*, *Boston Globe* (Oct 28, 2001) (available at http://www.harbourvest.com/media/pr/caught_10-28-01.html).

size of the commitment, secondary buyers are uninterested in a small commitment unless it can be purchased at a very steep discount... A potential resolution is to coordinate an aggregated sale of interests from limited partners who are in arrears or who have communicated a desire to place their future obligations with another party.³⁹

C. Are Investor Defaults Caused by Governance Considerations?

Even if investor defaults are common enough to generate concerns in the VC community, they would have little governance bite if they were mostly caused by investor illiquidity. Again, there is no good data on this, and surely some defaults (especially in lesser funds, populated by individual investors) are caused by investor illiquidity. However, practitioners believe that a sizable portion of defaults come from investors who could pay, but choose not to. As Doug Wright, a partner at Faegre & Benson, commented: “Investors have said we’re just not comfortable with investments you’re making, and we, therefore, refuse to make a capital call.”⁴⁰

Some well-publicized defaults were based precisely on investor disapproval of particular investments, as well as concerns about mismanagement during a fund’s earlier years. When Jeffrey Hussey of F5 Networks, Inc. sued J.P. Morgan Partners LLC, demanding, among other things, to be released from his contribution obligations, he cited exactly these governance considerations.⁴¹

Some industry participants explicitly frame the walkaway option in governance terms, comparing it to the option not to invest in a VC’s next fund:

There has been much talk recently about the increasing power of limited partners. That’s all well and good in theory, but what exactly are the options open to limited partners when faced with problem fund investments? ... Limited partners do, of course, have the option of threatening not to invest in a future fund. [However, in cases of VCs performing very poorly] “[t]hreatening not to invest in the future will not help much... Neither will it help motivate managers to get the most out of your investment. Some limited partners have gone still further—by defaulting on their current commitments. This is a new phenomenon in private equity and until recently, had been confined to high net worth individuals who saw their personal fortunes dwindle as the stock market plummeted.... But what is even more

³⁹ Ian Charles, Helping small limited partners in need – proactive solutions for defaulting LPs, Cogent Partners publication (09-18-2002), available at <http://www.altassets.com/knowledgebank/learningcurve/2002/nz2632.php>

⁴⁰ See Paula Moore, VC investors scale back on the big bucks, Denver Business Journal (April 5, 2002), available at <http://www.bizjournals.com/denver/stories/2002/04/08/story4.html>.

⁴¹ Id.

startling is that institutions are doing the same. “Over the last few months I have seen prominent institutions defaulting on their private equity commitments,” says one European investor.⁴²

A popular practitioners’ journal suggests that when investors default on their commitment obligations, they explicitly weigh the default penalty against the likelihood that a capital call will generate positive returns:

An investor may choose not to honor its capital commitment for any of a number of reasons. First of all, an investor may have liquidity issues... Secondly, as the outlook for certain types of funds has worsened, an investor may become wary of “throwing good money after bad.” The risk presented by this type of skittish investor is particularly pronounced for newer funds with poor operating history, funds with limited capital to protect their positions, and funds that were focused on underperforming sectors like the Internet or wireless technologies. If the defaulting limited partner’s unfunded capital commitment outweighs the capital already invested, or if the venture capital fund has already experienced significant losses, then the decision to walk away from a fund investment becomes easier.⁴³

D. Do Defaults Threaten Funds’ Liquidity?

Even a credible threat of default would not be a powerful governance tool if defaults had little adverse impact on funds’ ability to continue their operations. While there is no data on how often investor defaults affect a fund’s ability to finance new investments, industry insiders are concerned about this effect:

If the limited partners do not fund their capital commitments (because of ... a loss of interest in the fund’s investments), the absence of expected contributions may jeopardize the fund’s ability to grow as planned, which in turn may limit the general partners’ ability to take advantage of investment opportunities or make follow-up investments to which the fund may be contractually obliged.⁴⁴

⁴² All together now, AltAssets publication (10-04-2002), available at <http://www.altassets.com/features/arc/2002/nz766.php>

⁴³ Jay S. Rand and Allen L. Weingarten, When Limited Partners Default; Investors in General Are Reassessing Their Investment Strategies, Risk Tolerance, and Liquidity Needs, J. OF PRIVATE EQUITY, No. 2, Vol. 5; Pg. 31, at 32.

⁴⁴ James E. Topinka and Carol Kerr, Liabilities of General Partners of Venture Capital Funds: Old Legal Theories Create New Business Realities, on-line publication of Coudert Brothers LLP (08-07-2002), p. 3, available at http://www.coudert.com/publications/articles/020807_71_vcfunds_cblr.pdf. These authors also comment that “general partners must carefully follow the procedures and penalties for limited partners who default in their capital contribution commitments... General partners must take special care to document the failure of the limited partners to make capital commitments...” Id.

Likewise, Craig Douchy, a prominent VC attorney, lists the risk of multiple defaults and resulting “impair[ement to a] fund’s investment capacity” as an important consideration in choosing the appropriate default penalty.⁴⁵

E. Do Industry Participants Pay Attention to Default Penalties?

Industry participants are acutely aware of the importance of default penalties in affecting investor decisions whether to invest or default. These concerns provide further evidence that investors’ strive to maintain their reputations is insufficient to protect funds against the risk of default.

One popular concern is the use of penalties to prevent snowballing, where the default of one investor triggers other defaults. “If the word [about a weakly punished default of one investor] gets out, there’ll be a run on the bank,” comments Joseph Bartlett.⁴⁶ “Most funds are reluctant to forgive remaining commitments for fear of an avalanche of other limited partners requesting forgiveness,”⁴⁷ agrees Brett Byers. Daniel Finkelman, a top VC attorney, comments that letting a default go unpunished “may have the effect of encouraging additional partners to default.”⁴⁸ “If you allow one investor [to default without punishment], the others may begin asking about it,” comments Jon Staenberg, a senior VC.⁴⁹ “Ultimately... a fund may need to enforce some kind of sanction against defaulting limited partners—otherwise the fund may experience the classic ‘run on the bank’ scenario, where other limited partners decide that there is no penalty for not honoring capital commitments and they, too ought to consider defaulting,”⁵⁰ add Jay Rand and Allen Weingarten, senior VC attorneys.

F. Summary

In sum, there is plenty of anecdotal evidence that (a) industry participants view defaults (or threats of defaults) as an important issue affecting relationships between VCs and investors; (b) many defaults are caused by governance considerations, rather than investor illiquidity; (c) defaults can potentially threaten funds’ liquidity and impede their smooth operations; (d) a fund with weak default penalties could face a risk of cascading defaults; and (e) the choice of default penalty is an important issue in balancing the risk of investor “run on the bank” against the need to accommodate investor desire to abandon an underperforming VC.

⁴⁵ Craig E. Douchy, Limited Partner Defaults, (Notes for The Private Equity Analyst General Partner Summit, Cooley Godward LLP) (March 26, 2003), available at http://www.cooley.com/files/tbl_s5SiteRepository/FileUpload21/172/A1-2003-Muller.pdf, at 14.

⁴⁶ See Tenorio, *supra* note 35.

⁴⁷ See Byers, *supra* note 37.

⁴⁸ Daniel P. Finkelman, Aftermath of the Bubble: The Defaulting Investor Problem, VENTURE UPDATE (Spring 2002), at 2, available at <http://www.tht.com/pubs/pdfs/Venture%20UpdateSpring2002.pdf>

⁴⁹ Dawn Kawamoto, Tech Execs Backing Out of VC Pacts, NCET News.com (June 20, 2001), available at <http://news.com.com/2100-1017-268725.html?legacy=cnet>.

⁵⁰ Rand and Weingarten, *supra* note 43 at 34.

Conclusions

The idea that capital lock-in is beneficial to companies is intuitively appealing, but incomplete. Capital lock-in has significant drawbacks: it increases agency costs. I argue that instead of seeking maximum capital lock-in, firms actually seek the optimal degree of lock in, which reflects the level of agency costs and liquidity needs.

I test my hypothesis through a study of capital lock-in decisions made by venture capital funds. I find that the magnitude of capital lock-in is strongly and inversely related to several measures of expected agency costs. Contrary to the prediction of “maximum capital lock-in” theories, I find no evidence of a universal drive to maximize capital lock-in.

Table 1: Selected Summary Statistics

Characteristics of VC funds and VC firms in my sample. The sample consists of 38 U.S. venture capital partnerships raised by 18 venture firms.

	No. of Obs.	Mean	Stand. Dev.	Min.	Max.
Fund number	38	5.17	2.84	1	11
Detrended fund number					
Fund vintage year	38	1998	3.6	1987	2003
Total US VC fundraising in fund's vintage year (\$M)	38	48611	40843	2262	106203
Log of total US VC fundraising in fund's vintage year	38	10.266	1.2	7.72	11.57
Number of deals in US in fund's vintage year	38	4783	2522	1256	8124
Fund size (\$M)	38	356	280	20	1250
Log of fund size	38	5.52	0.97	3	7.13
California fund	31	0.81		0	1
Massachusetts fund	6	0.16		0	1
Washington fund	1	0.027		0	1
Fund is CA LLP	13	0.32		0	1
VC firm is CA LLC/corporation?	3	0.17		0	1
Number of funds per family raised by same VC firm	18	2.18	1.63	1	6
Year when VC firm was created	16	1984.64	11.49	1969	2002

Table 2: Default Penalty Coefficients

The types of default penalties used in VC partnership agreements and their coefficients. The sample consists of 38 venture funds raised between 1987 and 2003. The coefficient is a measure of the punishment's severity: 1 is the least severe punishment; 10 is the most severe.

Consequences of Default	What Else the Penalty Does	Coeff
Defaulter's account is reduced to zero.	Defaulter foregoes all future profits and is not responsible for future losses.	10
Defaulter forfeits all contributions made to date; forfeits 50% of all profits earned to date. Forfeits all future profits.	Defaulter loses all rights in the fund, other than the right to receive 50% of past profits. Payment is made at fund's liquidation without interest. Defaulter is not responsible for future losses. Defaulter loses the right to participate in fund's governance.	9
Defaulter's interest is repurchased at 70% of lesser of capital account ⁵¹ or original contribution	Defaulter is not responsible for future losses. Payment is made at time of repurchase.	9
Defaulter's interest is repurchased at lesser of capital contribution made to date or value of capital account	Defaulter is not responsible for future losses. Payment is made at time of repurchase.	8
Defaulter's interest is repurchased at the price of his capital contribution.	Defaulter is not responsible for future losses.	7
Defaulter's interest is repurchased at the price equal to the value of his capital account	Defaulter is not responsible for future losses.	7
Defaulter keeps original contributions and profits earned to date; foregoes all future profits. Responsible for his share of future losses.	Defaulter remains a limited partner.	6
Defaulter's capital account is reduced by 50%. Defaulter's share of future profits and losses is reduced by 50%.	Defaulter remains a limited partner. Defaulter remains responsible for 50% of future losses.	4
Defaulter pays high interest rate on uncontributed amount until contributed. If defaulter never contributes, VCs use more severe penalties; the interest comes out of	Defaulter remains a limited partner.	3

⁵¹ Capital account is usually defined as an investor's personal account, containing all contributions that an investor has made and his share of a fund's profits, minus an investor's share of a fund's losses.

the remainder of the defaulter's account.		
Defaulter is required to sell his interest. The price is any price that defaulter can negotiate.	Other limited partners have a right of first refusal at a price offered by a third party. If they refuse, defaulter can sell his interest to any third party approved by a VC.	2
Defaulter is excused from making this contribution, but retains the right to make other contributions in the future.	Defaulter remains a limited partner and retains all rights as such. This (non)-penalty is usually reserved for limited partners who are not allowed to make a particular contribution because of legal or regulatory restrictions.	1

Table 3: Univariate Comparisons

Univariate correlations among selected variables: default penalty; option term; detrended fund sequence number; fund's vintage year; detrended market hotness; natural logarithm of fund size; carry as percent of fund's profits; NPV of management fee as percent of committed capital; ratio of carry to management fee; borrowing ceiling as a percent of committed capital; fundraising restrictions as a percent of committed capital that must be invested before a VC can start raising a new fund; and minimum mandatory coinvestment by the VC as a percent of committed capital. Sample size is 38. Results significant at 5% level or higher are shown in **boldface**. Results significant at 10% level are denoted by an asterisk. *P*-values are shown under each correlation coefficient.

	Default Penalty	Option Term	Detrend Fund Number	Year VC Firm Format	Market Hotness	Year	Fund Size	Carry	Mgmt Fee	Ratio Carry/Mgmt Fee	Total VC Comp	Borrow Ceiling	Fund raising Restrict
Option Term	-0.139 0.404	1.000											
Detrended Fund #	0.172 0.303	-0.205 0.218	1.000										
Year VC Firm Formation	0.039 0.813	0.043 0.797	-0.000 1.000	1.000									
Market Hotness	-0.095 0.572	-0.117 0.484	0.226 0.173	0.106 0.525	1.000								
Year	0.158 0.345	-0.268 0.104	0.732 0.000	0.226 0.172	0.007 0.966	1.000							
Fund Size	0.458 0.004	-0.039 0.817	0.459 0.004	-0.148 0.375	0.146 0.382	0.375 0.020	1.000						
Carry	0.259 0.116	-0.394 0.014	0.465 0.003	-0.350 0.031	0.190 0.252	0.223 0.179	0.599 0.000	1.000					
Management Fee	0.157 0.346	0.067 0.690	-0.322 0.049	-0.321 0.049	-0.205 0.217	-0.355 0.029	0.247 0.134	0.333 0.041	1.000				
Ratio Carry to Mgmt Fee	0.065 0.697	-0.382 0.018	0.654 0.000	-0.077 0.645	0.352 0.030	0.441 0.006	0.309 0.059*	0.558 0.000	-0.568 0.000	1.000			
Total VC Compensat	0.265 0.108	-0.194 0.243	0.088 0.599	-0.414 0.009	-0.008 0.962	-0.079 0.638	0.528 0.001	0.813 0.000	0.819 0.000	-0.010 0.951	1.000		
Borrowing Ceiling	-0.219 0.187	-0.065 0.699	-0.437 0.006	-0.208 0.211	-0.043 0.798	-0.211 0.204	-0.217 0.191	-0.108 0.519	0.216 0.192	-0.225 0.175	0.057 0.735	1.000	
Fundraising Restrictions	0.134 0.424	0.504 0.001	0.167 0.318	0.499 0.001	-0.165 0.321	0.219 0.185	0.250 0.129	-0.099 0.553	-0.133 0.425	0.026 0.877	-0.145 0.385	-0.200 0.228	1.000
Min VC Coinvestme	0.126 0.457	-0.145 0.385	0.135 0.418	-0.067 0.690	-0.361 0.026	0.256 0.121	0.061 0.717	-0.002 0.991	0.010 0.951	-0.032 0.851	0.006 0.969	-0.032 0.849	-0.204 0.219

Table 4: Correlation coefficients and regression analyses for default penalty coefficient

The sample consists of 38 venture funds raised between 1987 and 2003. The first column contains univariate correlation coefficients. The remaining columns show the results of OLS regressions with venture-firm fixed effects. The top line of each cell is the regression coefficient; a bottom line is the *p*-value for a two-tailed test. The dependent variable is the default penalty coefficient. Independent variables include: (a) option term; (b) year of venture firm formation; (c) detrended fund sequence number; (d) natural logarithm of fund size; (e) fund's vintage year; (f) detrended market hotness; (g) borrowing ceiling as a percent of fund's committed capital; (h) fundraising restriction as a percent of fund's committed capital that must be invested before a VC is allowed to raise new funds; (i) carry as a percent of fund's profits; (j) NPV of management fee, as a percent of fund's committed capital; (k) total VC compensation; (l) ratio of carry to management fee; (m) minimum mandatory VC coinvestment as a percent of fund's committed capital. Results significant at 5% level or higher are shown in **boldface**. Results significant at 10% level are denoted by an asterisk.

	Univariate Compar	Regr (1)	Regr (2)	Regr (3)	Regr (4)	Increase Indep Variable Makes Walkaway	Hypothesis Supported	Hypothesis Rejected
<i>Dependent variable</i>	<i>Default Penalty Coefficient</i>							
Option Term	-0.139 0.404	-0.169 0.826	-0.039 0.958			Easier		
Year VC Firm Formation	0.039 0.813	-0.028 0.750	-0.025 0.765	-0.027 0.724	-0.023 0.804	Easier		
Detrended Fund Number	0.172 0.303	0.014 0.982	-0.319 0.608	0.039 0.943	0.158 0.794	Unclear		
Fund Size	0.458 0.004	1.155 0.023	2.049 0.011	1.113 0.016	1.178 0.027	Harder	Governance	Liquidity Investor-Reputation Info-Costs
Fund Vintage Year	0.158 0.345	-0.103 0.597	-0.067 0.724	-0.101 0.577	-0.188 0.455	Easier		
Market Hotness	-0.095 0.572	-0.362 0.384	-0.585 0.177	-0.350 0.395	-0.409 0.506	Easier		
Borrowing Ceiling	-0.219 0.187		0.187 0.133			Harder		
Carry	0.259 0.116			-0.048 0.796	-0.021 0.922	Easier		
Management Fee	0.157 0.346			-0.112 0.603	-0.154 0.552	Easier		
Ratio Carry to Mgmt Fee	0.065 0.697	0.055 0.979	-0.311 0.880			Unclear		
VC Total Compensation	0.265 0.108	-0.233 0.504	-0.410 0.255			Easier		
Minimum VC Coinvestment	0.126 0.457				0.013 0.672	Harder		
Fundraising Restrictions	0.134 0.424				-0.008 0.721	Easier		
Adj R-Squared		0.1268	0.1834	0.1678	0.0996			

Table 5: Correlation coefficients and regression analyses for option terms

The sample consists of 38 venture funds raised between 1987 and 2003. The first column contains univariate comparison coefficients. The remaining columns show the results of OLS regressions with venture-firm fixed effects. The top line of each cell is the regression coefficient; a bottom line is the *p*-value for a two-tailed test. The dependent variable is the term of VCs' option to call the entire committed capital. Independent variables include: (a) default penalty coefficient; (b) year of venture firm formation; (c) detrended fund sequence number; (d) natural logarithm of fund size; (e) fund's vintage year; (f) detrended market hotness; (g) borrowing ceiling as a percent of fund's committed capital; (h) fundraising restriction as a percent of fund's committed capital that must be invested before a VC is allowed to raise new funds; (i) carry as a percent of fund's profits; (j) NPV of management fee, as a percent of fund's committed capital; (k) total VC compensation; (l) ratio of carry to management fee; (m) minimum mandatory VC coinvestment as a percent of fund's committed capital. Results significant at 5% level or higher are shown in **boldface**. Results significant at 10% level are denoted by an asterisk.

	Univaria Compar	Regr (1)	Regr (2)	Regr (3)	Regr (4)	Regr (5)	Increase Indep Var. Makes Walkaway	Hypothesis Supported	Hypothesi s Rejected
<i>Dependent variable</i>	<i>Option Term (Years Needed to Call All Committed Capital)</i>								
Default Penalty	-0.139 0.404	-0.001 0.981	-0.006 0.917	0.006 0.904	0.014 0.801		Harder		
Year VC Firm Formation	0.043 0.797	-0.061 0.010	-0.065 0.008	-0.079 0.002	-0.086 0.002	-0.086 0.001	Harder	Governan Time-trend	Liquidity
Detrended Fund Number	-0.205 0.218	-0.081 0.602	-0.071 0.626	-0.005 0.968	0.058 0.715	0.018 0.899	Unclear		
Fund Size	-0.039 0.817	0.062 0.789	0.074 0.587	0.001 0.996	-0.119 0.595	-0.001 0.991	Unclear		
Fund Vintage Year	-0.268 0.104	0.054 0.362	0.044 0.464	0.046 0.393	0.027 0.637	0.032 0.556	Easier		
Market Hotness	-0.117 0.484	0.257 0.092*	0.280 0.072*	0.333 0.026	0.408 0.020	0.372 0.017	Easier	Governan Liquidity	
Borrowing Ceiling	-0.065 0.699	-0.003 0.940			-0.020 0.519		Harder		
Fundraising Restriction	0.504 0.001	0.015 0.010	0.015 0.009	0.019 0.002	0.0200 0.002	0.020 0.001	Easier		
Carry	-0.394 0.014	-0.176 0.005	-0.179 0.002				Harder	Governan	
Management Fee	0.067 0.690	0.146 0.029	0.148 0.027				Easier	Governan	
Total VC Compensation	-0.194 0.243			-0.266 0.002	-0.249 0.009	-2.273 0.001	Harder	Governan	Liquidity
Ratio Carry to Mgmt Fee	-0.382 0.018			-2.190 0.001	-2.199 0.002	-2.245 0.001	Harder	Governan	
Min VC Coinvestment	-0.145 0.385		0.004 0.593		0.007 0.373	0.006 0.417	Easier		
Adj R-Squared		0.8275	0.8301	0.8522	0.8449	0.8570			

Table 6: Summary

Summary of results for default penalty and option term from Tables 4-5. Only results significant on an at least 5% level are reported.

		Fund Size	Riskiness of VC Compens'n	Total VC Compens'n	Market Hotness	Year VC Firm Formation
Supported Hypotheses	Default Penalty	GOVERNAN	-	-	-	-
	Option Term	-	GOVERNAN	GOVERNAN	GOVERNAN LIQUIDITY	GOVERNAN TIME TREND
Rejected Hypotheses	Default Penalty	LIQUIDITY; INVESTOR REPUTATION INFO-COSTS	-	-	-	-
	Option Term	-	-	LIQUIDITY; INVESTOR REPUTATION INFO-COSTS	-	-