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Abstract

We develop a theory and empirical test of how the legal system affects the relationship between venture capitalists and entrepreneurs. The theory uses a double moral hazard framework to show how optimal contracts and investor actions depend on the quality of the legal system. The empirical evidence is based on a sample of European venture capital deals. The main results are that with better legal protection, investors give more non-contractible support and demand more downside protection. These predictions are supported by the empirical analysis. Using a new empirical approach of comparing two sets of fixed-effect regressions, we also find that the investor's legal system is more important than that of the company in determining investor behavior.

JEL Codes: G20, G30, G24, K22.

Keywords: Financial Intermediation, Law and Finance, Corporate Governance, Venture Capital.

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1 Introduction

The work of La Porta et al. (1997, 1998, 2000) demonstrates the importance of the legal system for economic activity. Their work, and a large ensuing literature shows that countries with different legal origins also systematically differ in terms of their financial systems. In this paper we ask how financial intermediation is affected by the nature of the legal system, focusing specifically on venture capital. We look at how the *entire* relationship—contractual and non-contractual— between an investor and an entrepreneur depends on the legal system.

Since it is not immediately obvious how the legal system should affect this relationship, we let our analysis be guided by theory. We examine how optimal contracts, and the resulting investor behavior, depend on the legal system. We propose a simple theory that makes three predictions. First, the better the legal system the more investors provide value-adding support. The underlying intuition is that investing in support activities is only worthwhile if the legal system provides investors with sufficient guarantees that these efforts will not be wasted. Second, the better the legal system the more they demand contractual downside protection, using securities such as debt, convertible debt, or preferred equity. The main intuition is that in a better legal system it is optimal to give the entrepreneur stronger upside incentives. In order to satisfy their participation constraint, investors thus require additional cash flow rights on the downside. Third, we consider the influence of the legal system on intermediaries' incentives to develop the competencies necessary to provide value added services, predicting that intermediaries from countries with a better legal system will provide more value added services, even when investing abroad.

To test the predictions of the theory, we use a hand-collected dataset on European venture capital investments for the period 1998-2001. We focus on venture capital as a specialized form of financial intermediation because prior research has already established the richness of relationships between venture capital firms and their companies.[1] Venture capital investors can play a value-adding role in the companies they finance, both through contracting and by providing largely non-contractible inputs such as advice and support. Europe is an excellent testing ground for our purposes, since it consists of a set of comparable countries with reasonably mature venture capital markets, yet it features a rich variety of legal systems.

Our sample consists of 1,431 venture deals from 124 venture capital firms in 17 European countries. Our primary data source is a comprehensive survey of all venture capital firms in these countries. We augmented the data with numerous secondary sources, includ-

[1] Throughout the paper we reserve the term 'firm' for the investor (i.e., the venture capital firm) and the term 'company' to the company that receives venture financing.

ing commercial databases and websites. This data collection effort required considerable time and effort but allowed us to gather a dataset that has several unique advantages. The dataset is considerably larger than other hand-collected datasets on venture capital, and is much richer than the commercially available databases; it also contains a significant number of investments that cross different legal systems. Moreover, it allows us to introduce to the literature a novel measure of the intensity of interactions between venture capitalists and entrepreneurs, a measure that cannot be obtained from standard sources of venture capital data (such as *VenturExpert*), nor from venture capital contracts.

We find clear empirical support for our theoretical predictions. Better legal systems are associated with more investor involvement and more downside protection for the investors. The results hold for legal origin, using the standard interpretation that the Anglo-Saxon common law system is better for investors than systems based on civil law. They also hold for two widely used index measures of the quality of the legal system: the rule of law and the degree of legal procedural complexity.

Our data allows us to examine whether the effects of legal systems come through the company or the investor, an issue that has not yet been fully answered in the prior literature. We introduce a novel empirical approach of determining the relative importance of company and investor legal system effects comparing two sets of regressions: one with company legal system variables and investor country fixed effect controls, the other with investor legal system variables and company country fixed effect controls. We find that company legal system effects are not robust to the introduction of investor country fixed effects, but that investor legal system effects are robust to the introduction of company country fixed effects. These results are consistent with the theoretical model prediction that investors from countries with stronger legal protection provide more support and demand more downside protection. They suggest that the legal system affects financial transactions not only directly, but also indirectly by affecting the practices adopted by financial intermediaries.

Our results provide new insights into how legal systems affect financial intermediation. In particular, they point to the importance of considering the relationship between investor and entrepreneur in its entirety, accounting both for contractual and non-contractual aspects. Moreover, the analysis shows how the legal system affects not only contracts, but also investors' actions and their investment styles. These findings also have implications for our understanding of cross country differences in financial intermediation. We discuss these implications, and their relevance for policy, in the main body of the paper.

The paper is organized as follows. Section 2 addresses the relationship with the literature. Section 3 develops the theoretical model. Section 4 describes the data. Section 5 discusses the empirical results. It is followed by a brief conclusion.

2 Related Literature

A few theoretical papers have begun to explore the relationship between legal systems and corporate finance choices. Shleifer and Wolfenzon (2002) examine a model where an entrepreneur wants to divert funds for private use. They show how the strength of the legal system affects the willingness to go public, and thus the equilibrium size of the capital market. Burkhart, Panunzi and Shleifer (2003) consider how the legal system affects a manager's ability to divert funds. They show that the willingness of an owner to delegate control to a manager and to sell shares to outsiders depends on the quality of the legal system. In a related vein, Burkhart and Panunzi (2006) consider the effect of shareholder protection on managerial incentives, monitoring and ownership concentration. Bergman and Nicolaievski (2007) develop a model where the quality of the judicial system drives the quality of enforcement. We are not aware of any theory paper that specifically addresses the role of the legal system for the non-contractual aspects of financial intermediation.

Our theory examines the relative use of debt and equity as a function of the quality of legal systems. It seems natural to relate this to the literature on costly state verification (Gale and Hellwig (1985)), which has argued that debt is an optimal instrument when the cost of verifying (and thus enforcing) state-contingent returns is high. This line of argument would suggest that debt is more important in poorer legal systems. However, upon closer inspection, this line of argument does not apply as much to our context. Venture capitalists fundamentally are equity investors, because their ability to write state-contingent contracts is a requisite for efficient contracting. Our analysis therefore focuses on an environment where the legal system is sufficiently good to allow for state-contingent contracts. The question we are asking then is not whether equity investors want to switch to debt, but whether equity investors want to add some debt. One of the interesting insights that we obtain from the model is an explanation of why this augmentative use of debt might actually be associated with better legal systems.

Because the theoretical literature remains under-developed, much of the empirical literature on legal system effects has focused on documenting empirical regularities. Demirgüç-Kunt and Maksimovic (1998), examine the effects of legal systems on financial or economic outcomes, providing evidence on the link between legal origin, financial institutions and company growth. Qian and Strahan (2007) look at how legal origin affects the design of bank loan contracts. Himmelberg, Hubbard and Love (2002) examine the effect of investor protection on firms' cost of capital. Desai, Gompers and Lerner (2005) examine the relationship between legal systems and firm dynamics, including entry and exit rates.

Our analysis also builds on the recent empirical venture capital literature, which examines both the contractible and non-contractible interactions between investors and en-

trepreneurs. See in particular Bottazzi, Da Rin and Hellmann (2007, 2008), Cumming, Schmidt and Walz (2004), Gompers (1995), Hellmann and Puri (2000, 2002), Hochberg (2003), Kaplan and Strömberg (2003, 2004), Lerner (1994), Lindsey (2007), Sahlman (1990), and Sørensen (2007).

Of particular relevance here are two recent papers based on venture capital data. Lerner and Schoar (2005) (LS henceforth) collect a sample of 210 transactions in 26 countries, made by 28 private equity firms, mostly between 1996 and 2001. They focus not purely on venture capital deals, but more broadly on private equity deals. Their data are mainly from developing, rather than developed countries, and their analysis is mainly based on comparing common and civil law countries (as well as former socialist systems). Among other things, they find that in countries with better legal systems, private equity investors switch from using simple securities, notably straight equity and debt, to using more sophisticated securities, such as convertible preferred stock.

Kaplan, Martel, and Strömberg (2007) (KMS henceforth) collect a sample of 145 venture deals made by 70 venture capital firms in 107 companies in 23 non-US (largely European) countries, mostly between 1998 and 2001. They compare these non-US investments with the US sample analyzed by Kaplan and Strömberg (2003). Their main dependent variables focus on contractual sophistication. Among other things, they find a positive relationship between better legal systems and the use of convertible securities. Their central finding, however, is that the coefficients for legal systems become insignificant after controlling for investors' sophistication. They measure sophistication by whether the investor is US-based or has experience investing in the US venture capital market.

Our study advances the literature on several counts. First, we develop a theoretical model that gives us a coherent framework for explaining how the legal system affects the entire financing relationship, in terms of contracts, non-contractual actions and even investor competencies. Second, we use a new data approach. LS and KMS gather private equity and venture capital contracts. This has the advantage of providing very detailed data on the contractual relationship between the venture capitalist and the entrepreneur. We choose a complementary approach of gathering survey data on venture capital activity. This has the advantage that we can go beyond the purely contractual aspects of the investment relationship. It also allows us to build a substantially larger sample than LS and KMS. Third, we are able to empirically examine the non-contractual dimension of the venture capital relationship. This component of value-adding support has been central in much of the theoretical venture capital literature, but its behavior across countries has not yet been studied empirically. Fourth, an interesting difference is that the prior literature identifies legal system effects mainly by comparing the US (and the UK to a limited extent) with a number of civil law countries. A potential concern is that the

legal system effects could be confounded with other US-specific effects that are related to the fact that the US is undoubtedly the market leader in venture capital. Our sample consists entirely of European investors and companies, and thus does not contain any US investors. Moreover, as a robustness check we perform an analysis in the subsample of civil law countries only. Fifth, our analysis provides a novel approach for comparing the relative importance of the companies' versus investors' legal system. The prior literature focuses mostly on companies' legal systems.[2] Our analysis suggests that company legal system effects are not as robust as investor legal system effects. This is an important and novel finding that also suggests new directions for future research.

There are many similarities between our results and those of LS and KMS. For example, all three papers find that the use of convertible preferred securities is associated with better legal systems. However there are also some differences.

In LS company legal effects remain significant throughout, whereas in this paper their significance vanishes once we control for the investor's country. Note that one of the advantages of having a much larger sample size is that it allows us to estimate models with country fixed effects. Another difference between this paper and LS concerns the relationship between legal systems and the use of pure debt. LS find a negative relationship, whereas we find a positive relationship. The most likely explanation is sample differences, in particular the kind of investments found in the relatively poorer legal systems. In LS, those investments are largely made by non-venture private equity investors, who invest in traditional sectors such as manufacturing, and who provide capital for expansion or buyouts. The invested companies are likely to have significant assets and therefore a higher debt capacity. By contrast, in our sample investments are made by venture capitalists, who largely invest in early-stage, high-technology companies with relatively few assets. Moreover, note that in the LS sample companies face severely underdeveloped banking systems, where the provision of standard bank loans cannot be taken for granted. Their equity investors may have to fill an additional market gap that is not present in our sample.

Similar to KMS, we also find that company legal system effects become insignificant once we control for enough investor characteristics. One minor difference is that in our setting we need to use investor country fixed effect to render company legal system effects insignificant, whereas KMS only use measures of investor sophistication, namely whether the VC firm has experience investing in the US, or syndicating with US VC firms. In our setting these specific measures turn out to be less important, although we find that having individual partners who worked in the US as venture capitalists has effects similar

[2] Both LS and KMS contain one table where they add a dummy for whether the investor is from a common or civil law country. In both papers this simple dummy variable turns out to be statistically insignificant, and both papers then refrain from further investigation of investor legal system effects.

to those observed by KMS. The other difference, of course, is that our analysis emphasizes the investor's legal system as an important driver of investment behavior.

3 Theory

The main objective of the theory is to motivate the empirical analysis and provide a conceptual framework for understanding the main empirical results. The model is based on the double moral hazard problem which has become the workhorse of the theoretical venture capital literature (Casamatta (2003), Cestone (2004), Hellmann (1998, 2006), Inderst and Müller (2004), Repullo and Suarez (2004), Schmidt (2003)). Our main theoretical contribution is to introduce legal systems issue into such a double moral hazard model.

3.1 Assumptions

Consider an entrepreneur who requires an investment amount k_V to start a company. The entrepreneur is wealth constrained and her opportunity cost of doing the venture is given by k_E. With probability $(1-p)$ the company is a failure, and it is unable to generate any cash flows. Still, the company will have some assets, that have a value a. For simplicity we assume that assets cannot be stolen.[3] With probability p, the company is a success, generating additional cash flows π. However, whether these cash flows are divided according to the contract depends on the quality of the legal systems of the two contracting parties. We assume that with probability μ_E the entrepreneur identifies a weakness in the legal system that allows her to divert the cash flows π into her pockets. Similarly, with probability μ_V the investor identifies a weakness in the legal system that allows him to divert the cash flows π into his pockets. Naturally we assume $\mu_E + \mu_V \leq 1$. It is natural to associate these probabilities with the qualities of the respective legal systems. The better the entrepreneur's (investor's) legal system, the less likely she (he) is able to identify such a weakness, and thus the lower μ_E (μ_V).

For the double moral hazard problem, we use a tractable linear-quadratic specification, where the probability of generating additional cash flows is given by:

$$p = p_0 + p_E e + p_V v.$$

Let e measure the non-contractible effort of the entrepreneur, and v measure the amount

[3] This assumption simplifies the exposition. It is easy to verify that it does not affect any of the results. Allowing asset stealing would not affect incentives but create additional inefficiencies. It would therefore only reduce the range of parameters for which financing is feasible in the first place.

of non-contractible value-adding support of the venture capitalist. We assume quadratic private effort costs $c_E = e^2/2$ and $c_V = v^2/2$. The parameters p_E and p_V measure the relative importance or ability of the entrepreneur and venture capitalist. Throughout we assume that p_0, p_E and p_V are sufficiently small to ensure that $p < 1$ - the appendix derives the formal condition for this.

In this simple model, the value of the company can only take two values: $a + \pi$ on the upside, and a on the downside. The venture capitalist's cash flow rights are linear, so that w.l.o.g. they can be expressed as a combination of (safe) debt and (risky) equity. Let d denote the face value of debt, and s the venture capitalist's equity share. The venture capitalist receives $d + s(a - d)$ on the downside and $d + s(\pi + a - d)$ on the upside.[4]

We assume that stealing is risky or otherwise costly, so that the entrepreneur's expected returns from stealing are given by $(1 - \phi)\pi$, where $\phi\pi$ measures the net cost of stealing.[5] For $\phi > s$ the entrepreneur would never want to steal, since the returns from stealing are lower than the returns from sharing cash flows according to the contract. Similarly, for $(1 - \phi) < s$ the investor would never want to steal. We focus on the non-trivial case where $\phi < s < 1 - \phi$, so that both parties always prefer stealing over sharing. This condition is naturally satisfied for sufficiently low values of ϕ.

Let u_E and u_V denote the utilities of the entrepreneur and venture capitalist, respectively. Then:

$$u_E = (1 - s)(a - d) + p\pi z_E - c_E - k_E \text{ where } z_E = \mu_E(1 - \phi) + (1 - \mu_E - \mu_V)(1 - s)$$
$$u_V = d + s(a - d) + p\pi z_V - c_V - k_V \text{ where } z_V = \mu_V(1 - \phi) + (1 - \mu_E - \mu_V)s$$

We assume that the venture capitalist has all the bargaining power; we relax this assumption in Section 3.4. The optimal contract maximizes u_V by choice of d and s, subject to $u_E \geq 0$, $u_V \geq 0$. To focus on non-trivial cases we assume that it is possible to satisfy these two participation constraints. The timing of the game is as follows. At date 0, the entrepreneur and investor agree on a contract specifying the amount of debt and equity (d and s). At date 1, the two parties exercise private effort (e and v). At date 2,

[4] This does not mean that investors are restricted to use those specific securities. Indeed, as we will discuss in the empirical analysis, venture capitalists often use convertible preferred equity. For simplicity's sake, the theoretical model does not try to distinguish between these alternative securities (see Hellmann (2006) for a detailed analysis). Instead, the model focuses on the more general trade-off between upside incentives and downside protection, which can be implemented either with a combination of debt and equity or with convertible preferred securities.

To see this more formally, note that we can map convertible preferred equity into the model as follows. Let $\widetilde{d}$ denote the face (or preferred) value before conversion, and $\widetilde{s}$ the percentage equity stake after conversion. We then have $\widetilde{d} = d + s(a - d)$ and $\widetilde{s}(a + \pi) = d + s(\pi + a - d) \Leftrightarrow \widetilde{s} = s + \dfrac{(1 - s)d}{a + \pi}$.

[5] For simplicity we assume that ϕ is a constant. Albeit tedious, it is possible to also allow the costs of stealing to vary with the quality of the legal systems.

cash flows π occur in case of success. They are either stolen, or else divided according to the contract. In addition, the asset value a is distributed according to the contract.

3.2 Optimal contracts

We solve the model backwards. Taking the stealing probabilities from date 2 as given, the two parties choose their optimal effort levels at date 1. We obtain the two incentive constraints from the first-order conditions of maximizing u_V w.r.t. v, and u_E w.r.t. e:

$$e = p_E \pi z_E \text{ and } v = p_V \pi z_V \tag{1}$$

To see how equity affects incentives, note that increasing s increases z_V and thus v, and it decreases z_E and thus e. Interestingly, v and e are independent of d. This means that debt only transfers utility between the entrepreneur and the venture capitalist. Put differently, in this simple model, downside protection gives the venture capitalist additional cash flow rights without affecting the balance of incentives. Hellmann (2006) shows that even in a much more general setting, downside protection plays a similar role.

The optimal choices of d and s depend on whether the entrepreneur's wealth constraint is binding or not. Figure 1 shows the utility frontier for the entrepreneur and venture capitalist. Its shape is standard for the double moral hazard model with wealth constraints. If the entrepreneur receives a relatively high utility u_E (which is necessary for high values of k_E), then the utility frontier consists of a $-45°$ line. The entrepreneur's wealth constraint is not binding, and the two parties can implement a jointly optimal contract that we denote by s^* and d^* (derived below). Along the $-45°$ line, the venture capitalist can increase his utility by increasing d. At $d = a$, however, the entrepreneur's wealth constraint becomes binding. To further increase the venture capitalist's utility, the venture capitalist can only increase s above s^*. This reduces the entrepreneur's effort level, which is inefficient and causes the utility frontier to slope at an angle less than $-45°$ for lower levels of u_E. For very low levels of u_E, the utility frontier may even bend backwards: the venture capitalist holds excessive equity and the entrepreneur provides very little effort, to the point that the venture capitalist is worse off himself. In equilibrium the venture capitalist will never offer a contract on the backward bending part of the utility, but instead choose $s^{\max}$, which corresponds to the peak of the utility frontier.

In the Appendix we solve out the remainder of the model and derive its comparative statics. In the main text we only report the main results, and focus on discussing the intuition behind them.

Proposition 1 ***(Investor support)*** *The optimal level of value-added support v^* is in-*

creasing with the quality of the entrepreneur's and investor's legal system. Formally, $\frac{dv^*}{d\mu_E} < 0$ *and* $\frac{dv^*}{d\mu_V} < 0$.

Why would investors provide less support in a worse legal system? Stealing by the entrepreneur creates two kinds of inefficiencies. First, stealing upsets the balance of incentives. For a given equity stake s, the more the entrepreneur can steal, the stronger her incentives for value-creation, but the weaker the investor's incentives. Second, any stealing causes a loss of value, as measured by ϕ. The first inefficiency can be addressed by adjusting the optimal division of equity. In particular, the Appendix shows that s is a decreasing function of μ_E. This says that to correct for stealing by the entrepreneur, the optimal contract increases the investor's equity incentives. However, the key insight from the model is that even with the optimal rebalancing of incentives, the support provided by the investor remains lower when the entrepreneur steals more. The key intuition is that the readjustment of equity stakes can only take care of the first but not the second inefficiency. That is, even the optimal contract cannot compensate for the fact that stealing creates inefficient loss of value. This reduces the total upside returns, and thus ex-ante incentives for investor support.

This insight is also key in understanding the second part of Proposition 1. At first, the result that more stealing by the investor reduces his support might seem counter-intuitive. After all, if the investor can steal more of the cash flows, shouldn't he have stronger incentives to generate them? The reason this intuition is wrong goes back to the two inefficiencies of stealing. If the investor can steal more, this creates an incentive imbalance where the investor has stronger (but the entrepreneur weaker) incentives. The optimal contract rebalances this inefficiency by reducing the investor's equity stake. However, the optimal contract cannot remedy the second inefficiency, concerning the overall value loss caused by inefficient stealing. That is why we obtain the result that more stealing by the investor also leads to less investor support.

Proposition 1 thus yields our first testable implication, that there is a positive relationship between the quality of the respective legal systems, and the support provided by venture capitalists. This effect applies not only to the entrepreneur's legal system (as proxied by the entrepreneur's probability of stealing), but also to the investor's legal system (as proxied by the investor's probability of stealing).

We now turn to the second main result, concerning the optimal level of debt. If the entrepreneur faces a binding wealth constraint, then $d = a$, i.e., the level of debt is fixed. The interesting case thus pertains to the model without wealth constraints. In the Appendix we derive a critical value of k_E that we denote by $k_E^{\max}$.

Proposition 2 ***(Downside protection)*** *Suppose $k_E < k_E^{\max}$. The optimal level of debt d^* is increasing with the quality of the entrepreneur's and investor's legal system. Formally,* $\frac{dd^*}{d\mu_E} < 0$ *and* $\frac{dd^*}{d\mu_V} < 0$.

Proposition 2 yields our second testable implication, that in better legal systems the optimal contract gives the venture capitalist additional downside protection. A priori, it is not immediately clear how the quality of the legal system might affect downside protection. To get the intuition for Proposition 2 consider first the effect of a better legal system for the entrepreneur (i.e., lower μ_E). The less the entrepreneur can steal, the more the optimal contract allocates equity to the entrepreneur. There are also fewer efficiency losses from less stealing. Even though the entrepreneur gets to steal less, her total utility on the upside is higher in a better legal system. This implies that the investor can extract more rents from the entrepreneur on the downside and still satisfy the entrepreneur's overall reservation utility. In essence, in a better legal system the investor is willing to give up more upside equity in exchange for more downside protection.

Proposition 2 also shows that a similar reasoning applies for the investor's legal system. The less the investor steals, the higher the entrepreneur's utility on the upside. This is true even after accounting for the rebalancing of equity incentives. As a consequence the investor can again ask for more downside protection, and still satisfy the entrepreneur's reservation utility.

Proposition 2 requires a mild technical condition, $k_E < k_E^{\max}$, which is derived and explained in the Appendix. The reason this condition is required is that the investor's total payoff on the downside is a combination of debt and equity (i.e., $d + s(a - d)$). The argument above explains why total downside protection is higher in a better legal system. Note, however, that this can be achieved with higher d and/or higher s. The technical condition $k_E < k_E^{\max}$ ensures that not only total downside protection ($d + s(a - d)$), but also debt (d) is a decreasing function of the stealing probabilities. Moreover, the Appendix shows that the upper bound on k_E can also be re-expressed as an upper bound on the asset value a.

3.3 Investor's legal system

In our interpretation we associate the companies' legal system with the probability of stealing by the entrepreneur (μ_E) and the investor's legal system with the probability of stealing by the investor (μ_V). While this is the most immediate interpretation, it simplifies a more complex reality. The ability of an investor to divert funds from the company may also depend on the company's legal system, and the ease with which an entrepreneur can

appropriate cash flows may also depend on the investor's legal system. Put differently, in addition to the primary effect that one party's legal system has on its own probability of stealing, there may also be a secondary effect on the other party's probability of stealing. In our model this turns out not to matter much, because Propositions 1 and 2 establish that stealing by the entrepreneur and investor have symmetric effects—they both decrease investor support and downside protection. The primary and secondary effects therefore all point in the same direction.

So far we have treated the legal system as something that affects the probabilities of stealing. We now discuss the possibility that the legal system has a broader effect on the way that investors behave. In particular, we focus on the parameter p_V, which measures the value-adding competencies of venture capitalists. At the time of investment, these can be taken as exogenous. However, venture capital firms can also make decisions about how much they want to develop value-adding competencies. We can therefore think of p_V as being set at a prior date, before the venture capital firm engages in deals.

We then ask whether venture capitalists that operate predominantly in a better legal environment also have stronger incentives to develop value-adding competencies. We assume that each venture capital firm has an exogenously given home country and develops competencies in line with its expected deal flow. This can be characterized by a probability distribution Ω over the types of entrepreneurs that it expects to invest in. Entrepreneurs may differ in terms of all model parameters. Let the vector x summarizes all these deal characteristics, namely p_0, p_E, k_E, k_V, π and a. We write $\Omega(\mu_E, \mu_V, x)$, noting that the distribution of entrepreneurs depends both on x and the stealing parameters μ_E and μ_V. We capture the notion of an investor's home effect as follows. We assume that investors located in worse legal systems face a deal flow containing higher values of μ_E and μ_V. Formally, we equate a worse domestic legal system with a first-order stochastic dominant shift of the distribution of μ_E and/or μ_V, holding x constant.

In our model, the value-adding competencies of the venture capitalist are represented by the support parameter p_V. We assume that the cost of developing competencies is given by a convex cost function $C_V(p_V)$. Each venture capitalist chooses p_V to maximize his utility, given by $U_V = \int u_V(\mu_E, \mu_V, x) d\Omega(\mu_E, \mu_V, x) - C_V(p_V)$.

Proposition 3 ***(Investor competence effect)***

(i) The better the entrepreneur's or investor's legal system, the more a venture capitalist develops value-adding competencies. Formally, the optimal choice of p_V is decreasing for any first order stochastic dominant shift of μ_E and μ_V.

(ii) For a given μ_E and μ_V, the level of venture capital support v^* is increasing in p_V.

For $k_E < k_E^{max}$, the optimal amount of debt d^* is also increasing in p_V.

Proposition 3 consists of two parts. Part (i) shows that in better legal environments venture capital firms have greater incentives to develop value-adding competencies. Intuitively, competencies are more valuable if the legal system is good. Formally, the proof shows that the marginal benefit of developing competencies is decreasing in μ_E and μ_V. Part (ii) shows that, within a given legal system, venture capitalists with higher competencies provide more support. Under a mild technical condition (k_E not too large) they also ask for more downside protection. Proposition 3 implies that in a given country there can be systematic differences between domestic and foreign investors. Specifically, if the foreign investors come from a better legal system, they are likely to provide more support and ask for more downside protection (and *vice versa*). Proposition 3 captures one important channel of how the investor's legal system might influence investment practices.

Naturally there may be yet additional ways in which the investor's legal system matters. For instance, it may affect the relationship between venture capitalists and their own providers of funds. Venture capital firms typically receive their funds from a variety of institutional investors such as pension funds. These financiers are typically referred to as limited partners. Axelson, Strömberg and Weisbach (2007) provide a theory of how this relationship is optimally structured. The legal system is likely to influence this relationship, especially in terms of transparency and the governance that limited partners may exercise over venture capitalists. While a formal model of this relationship is beyond the scope of this paper, it is intuitively clear that a better legal system would better protect limited partners from being expropriated by venture capitalists. Similar to Proposition 1, this implies more efficient contracting, so that venture capitalists retain more of the upside, and therefore face better incentives. Limited partner effects should thus further reinforce the predictions from Propositions 1 and 2.

The relationship between venture capitalist and limited partners is typically based on arm's length legal contracts. In a weaker legal system contracting problems might result in vertical integration as an alternative governance structure. Vertically integrated venture capitalists are usually referred to as 'captive' firms, and are typically owned by banks or corporations. Beyond investor behavior (as in Proposition 1 and 2) and competencies (as in Proposition 3), the investor's legal system might even influence the investor's organizational structure. We will explore this further in the empirical analysis.

3.4 Further discussion

Our model assumes that venture capitalists have all the bargaining power. Relaxing this does not affect Propositions 1 and 3, but it may affect Proposition 2. In the Appendix

we consider the generalized Nash bargaining solution, where the venture capitalist's bargaining power β can take any value between zero and one. We show that there exists a value $\widehat{\beta}$ (with $0 \leq \widehat{\beta} < 1$), such that Proposition 2 continues to hold for $\beta > \widehat{\beta}$. For $\beta < \widehat{\beta}$, however, the model predicts a negative relationship between the qualities of legal systems and the optimal amount of debt.

The model uses a simple specification of returns, where there are only two states: the upside and the downside. It is easy to see that adding a third state, where the venture is a complete failure with all assets being worthless, while maybe adding some realism, would not change any of the results. More generally, Hellmann (2006) shows how the intuitive results from a model with two states carry over to a much more general specification of returns.

We model the quality of the legal system in terms of the probability of stealing. An alternative interpretation of the model is to think of $(1 - \mu_E - \mu_V)\pi$ as the amount of cash that is verifiable, and can thus be allocated between the entrepreneur and venture capitalist. The entrepreneur is able to steal an amount $\mu_E\pi$, but incurs a cost of stealing $\phi\mu_E\pi$. Similar for the investor. This specification generates identical payoffs for the venture capitalist and the entrepreneur, implying that the analysis remains valid. This alternative interpretation has the attractive feature that it makes stealing a continuous as opposed to bivariate variable. One technical limitation, however, is that it requires linearity of contracts as an assumption.[6]

For simplicity we use a linear-quadratic specification, where the efforts of the entrepreneur and investor are perfect substitutes (i.e., $p = p_0 + p_E e + p_V v$). In reality the interactions between those two parties are likely to be more complex. For instance, there may be complementarities between the two efforts. Formally, we can model this with a Cobb-Douglas specification, where the probability of success is given by $p = \gamma e^{\alpha} v^{\beta}$. Due to the complexity of our model, which includes double-sided moral hazard as well as stealing of cash flows by two parties, the model with $\alpha \neq \beta$ is not tractable. However, in the Appendix we show that Propositions 1 and 2 continue to hold for the symmetric case of $\alpha = \beta$. We notice that Inderst and Müller (2004) also find that the linear-quadratic and Cobb-Douglas model yield analogous results in their model of venture financing.

[6] In the bivariate interpretation there are only two outcomes, so that linear contracts are always optimal. The interpretation with continuous stealing has an additional complication, in that the venture capitalist could offer an artificial non-linear contract that discourages stealing. Specifically, the contract would give the entrepreneur her share allocation $(1 - s)$ whenever profits are exactly π, but nothing if profits fall short of π. This non-linear contract is largely an artifact of simplifying model assumptions, and bears no resemblance to real world securities. In summary, the alternative interpretation of stealing continuous amounts remains attractive as long as one is willing to impose linearity.

4 The Data

In this Section we discuss the sources and nature of our data. We want to point out that the European venture capital markets is a useful setting for testing our model. European countries are broadly comparable in terms of their stages of economic development. The European venture capital market has matured considerably throughout the 1990s, growing in size and in its ability to invest in innovative companies with a potential for high-growth (Bottazzi and Da Rin (2002, 2004), Da Rin, Nicodano, and Sembenelli (2006)). It also has countries with diverse legal origins and with diverse legal qualities.

4.1 Sources of data

Our data come from a variety of sources. Our primary source is a survey that we sent to 750 venture capital firms in the following seventeen countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the UK. This set of countries includes all the members of the European Union in the period under study, plus Norway and Switzerland.

We contacted venture firms that satisfied three conditions: (i) in 2001 they were full members of the European Venture Capital Association (EVCA) or of a national venture capital organization, (ii) they were actively engaged in venture capital, and (iii) they were still in operations in 2002.

We deliberately excluded private equity firms that only engage in non-venture private equity deals such as mezzanine finance, management buy-outs (MBOs) or leveraged buy-outs (LBOs).[7] However, we did include private equity firms that invest in *both* venture capital and non-venture private equity deals. For these, we considered only their venture capital investments.

We collected our survey data between February 2002 and November 2003. We asked venture capital firms about the investments they made between January 1998 and December 2001. The questions centered on key characteristics of the venture firm, on the involvement with portfolio companies, and on some characteristics of these companies. The survey asked respondents a substantial amount of detailed company-level information. We also asked information on the educational background and work experience of each venture partner.

We received 124 responses with various degrees of completeness. Of these, three venture firms had been formed in 2001 but had not yet made any investments, so we do not

[7] See Fenn, Liang and Prowse (2003) for a discussion of how the venture capital market is structured into two different segments, 'venture capital' and 'non-venture private equity.'

include them in our sample. We contacted all the venture firms that had sent us incomplete answers, and attempted to complete them whenever possible. As a further step, we augmented the survey data with information from the websites of the respondents and their portfolio companies. We also turned to commercially available databases: Amadeus, Worldscope, and VenturExpert. We use information from these databases for two purposes. First, they allow us to obtain missing information, such as the dates, stages, and amounts of venture deals. Second, we use these databases to cross-check the information obtained from respondents. Such cross-validation further enhances the reliability of our data. Overall, we obtain data on 1,652 deals made by 119 venture firms. Unlike other papers, we refrain from using data from additional rounds that an investor makes in a given company. That is, we restrict our data to the first investment made by the investor in the particular company. In the main body of the paper we focus the analysis on investments within Europe (we discuss this further in Section 5.4). We thus drop investments in non-European countries; as a result, our sample consists of a total of 1,428 deals. Moreover, our sample includes 51 investors who invest abroad, in a total of 190 foreign deals.

Can we assess the quality of our sample relative to the underlying population? Other papers in the literature avoid this question, because it is extremely difficult to gather information on the population. Unlike banks, venture capital firms are not heavily regulated and do not need to disclose information. To gather data on the population of 750 European venture capital firms, including those that did not respond to our survey, we used two sources, the commercial database VenturExpert, and the statistics published by the European Venture Capital Association (EVCA). We also made a substantial attempt to collect additional data through direct phone calls, as well as through websites and other trade publications. With considerable effort, we were able to gather information on more than two thirds of the population.

This additional data allows us to perform several checks on how well our sample represents the population of European venture capital firms. First, we look at how the sample fares in spanning the underlying population. Table 1 compares the sample with the population it is drawn from. Panel A looks at the country composition. While there is some variation in response rates across countries, our data represent a comprehensive cross-section which provides a good coverage of all countries. No single country dominates the response, and no country is left out. Most notably, our sample performs well in terms of including firms from the larger venture capital markets: France, Germany, and the UK all have response rates above 13%. The overall response rate of nearly 16% is larger than for comparable surveys of industrial firms, as discussed by Graham and Harvey (2001).[8]

Panel B looks at the structure of both the sample and the population in terms of

[8] The typical response rate for such surveys is about 9%.

organizational types. We partition the sample into independent, bank, corporate, and public venture capital firms. Prior research has shown that alternative types of venture firms may behave differently, and we want to ensure that our results are not driven by the sample composition. Our sample closely reflects the distribution of types in the population.

Panel C compares the size distribution of our respondents with that of the population. We consider two possible size measures: the number of partners, and the amount of capital under management, both measured at the end of 2001. For the sample and the population the mean and median values of partners virtually coincide. The amount under management includes all funds managed by venture capital firms, including those invested in non-venture private equity. The average firm size is larger for the population, due to the fact that several large private equity firms, that invest mainly in non-venture private equity, chose not to respond to our survey. Consistent with this, the median firm size is very similar for the sample and the population.

Another notable strength of our data is it does not rely on a few venture capital firms. Indeed, the single largest venture capital firm accounts for only 5% of the observations, and the largest five venture capital firms for only 16% of the observations.

We also examine whether our respondents report only part of their portfolio, especially if they tend to report their more successful deals. We address this concern in three ways. First, in late 2003 we checked the websites of all respondents. When we exclude the 15 venture firms whose websites did not list portfolio companies, we find that the portfolio companies reported to us were over 90% those listed on the websites. Since two years had elapsed from the closing of our sample, and new investments had naturally been made, we conclude that our sample covers well over 90% of all deals, suggesting that it is unlikely that our sample suffers from systematic under-reporting. Second, we compare the exit rates for our sample with the official statistics of the European Venture Capital Association (EVCA), which classifies IPOs, and mergers and acquisitions as exits. We made an additional data collection effort and obtained exit outcomes for all of our companies, using the same classification (see Bottazzi, Da Rin and Hellmann (2008) for details). We find that 24.7% of companies in our sample had a successful exit rate over the period 1998-2005, By comparison, we obtain from EVCA all investments and exits over the same period and find an exit rate of 25.6%. It therefore appears that our sample is not biased towards more (or less) successful companies. Third, we also consider the possibility that there may be reporting biases in our data. Respondents might choose not to answer all of our questions about their activities when their companies are not performing well. To see whether our data present any such bias, we performed some additional tests. For all of our dependent variables we correlate the exit rate with the response rate. We find that all the correlation coefficients are all below 6%. We also estimate (unreported) Probit

models to see whether the exit rate might explain reporting rates after controlling for other observable characteristics. Naturally, we can only control for those characteristics for which we have complete or near-complete reporting, namely investor characteristics and company sectors. We find that the exit rate is statistically highly insignificant. These results suggest that there is no reporting bias towards more successful companies.

4.2 Data Variables

Table 2 provides formal definitions for all variables used in the analysis. Table 3 reports pairwise correlations between all variables. Table 4 Panel A contains descriptive statistics for all the variables used in the analysis. The number of observations differs across regressions because of missing values for some of the variables. Table 4 Panel B shows the means (or frequency) of our main dependent and independent variables across legal origins.

4.2.1 Motivating the dependent variables

In this paper we focus on how the legal system affects the activities of venture capitalists and their interaction with portfolio companies. Led by our theoretical model, we concentrate on two different dimensions of the venture process: value-adding support and the choice of securities.

The role of value-adding support (Proposition 1) has become a central theme in venture capital research (Casamatta (2003), Hellmann (2000, 2002), Cestone (2004)). To capture the notion of support, we use INTERACTION, a measure of the amount of interaction, looking at the reported frequency with which a venture capitalist is in contact with the company. This is a useful summary measure of the amount of time and effort that the venture capitalist spends on the company; it is also a novel measure in the venture capital literature.[9]

Kaplan and Strömberg (2003) explain that while venture capitalists use a variety of securities, many of these perform equivalent functions. Of central importance is how the entire package of securities affects the distribution of cash flows rights, and especially to what extent the venture capitalist gets his returns on the upside as compared to the downside (Proposition 2). In an ideal scenario, we would be able to gather complete data on the allocation of cash flows rights, including all term sheets and valuations. However, since such data is extremely sensitive, and since our aim was to gather a large and representative

[9] Note that while it is reasonable to consider the frequency of interactions largely a non-contractible variable, it is not impossible that contracts (which are not observable to us) may still attempt to specify some expectations about this. Even if specified in the contract, the enforceability of such clauses remains uncertain.

dataset, we deliberately limited our inquiry. We collected data on the types of securities used, but not on the specific term sheets or valuations.

In our survey we asked about the entire set of securities used for each deal. This question allowed for multiple responses. Since we consider this data of interest by itself, Table 4, Panel B, tabulates, by legal system, the types of securities used in our dataset. We see clear variation in the use of securities across legal systems.

To move beyond a mere description of the securities used, we leverage our theory. Proposition 2 predicts that the optimal amount of debt, d^*, is decreasing in μ_E and μ_V. This suggests that the better the legal system, the more the optimal contract places emphasis on downside protection. Unfortunately, we do not have access to the details of the legal contract, so that our data does not allow us to measure exact values of d^*. For the empirical analysis we therefore rely on survey-based responses about the use of debt and downside protection. This allows us to construct DOWNSIDE, a proxy variable for the relative importance of downside protection. Using the data from Table 4, we refer to straight debt, convertible debt and preferred equity as 'downside securities,' since they all give the venture capitalist a larger stake on the downside, and build variables for the use of each individual security in each financing deal.[10]

4.2.2 Motivating the independent variables: legal origin and legal indices

Our first group of independent variables concerns the legal system of companies and investors. We employ three alternative measures of the quality of the legal system. Legal scholars classify national legal systems according to the legal origins of the commercial code. La Porta et. al. (1998) propose two main categories: legal systems with common law origin, and legal systems with civil law origin. The former category includes Anglo-Saxon common law, while the latter includes French civil law, German civil law and Scandinavian civil law. We construct two dummy variables (COMPANY–COMMON and INVESTOR–COMMON) that classify our companies according to these two categories, using civil law as the default category.

An alternative approach of classifying legal systems is to use more specific indices, which measure certain aspects of the legal system. We use two standard indices: the rule of law and the procedural complexity index. These two indices relate directly to our concept of the 'quality' of enforcement in a legal system. In our model the parameter μ_E measures the probability with which an entrepreneur can steal from her company without

[10] In the instructions to the survey we specified functional definitions of these different financial instruments in order to ensure consistency of responses. For example, our definition of convertible debt includes convertible preferred debt, which is a security often used in venture deals (see Kaplan and Strömberg (2003)).

the investors detecting him. We look for empirical counterparts of this concept.

La Porta et. al. (1998) provide a detailed explanation of the rule of law index, which measures the quality of legal enforcement. Their index is based on data for the early 1990s. Since enforcement evolves over time, we use a version of the rule of law index which measures the quality of enforcement in the year 2000 and is published by the World Bank (COMPANY–RULE, INVESTOR–RULE).

Our second index measure of the quality of the legal system, COMPANY–PROCEDURAL (and INVESTOR–PROCEDURAL) is the index of procedural complexity, which measures the degree of legal formalism, by averaging the cost, length of time and number of steps necessary to perform two simple legal operations: recovering a bounced check and evicting a tenant.

4.2.3 Motivating the independent variables: venture firm, company, and deal variables

Our second set of independent variables captures investor-level and deal-level effects. Independent venture capital firms (INDEPENDENTVC) are conceived as specialized organizations, whose sole purpose is to maximize profit. Captive venture capital firms are investment vehicles that are used by established companies, banks, or the government, to achieve both profits as well as broader strategic goals (Gompers and Lerner (2000), Hellmann (2002), Hellmann, Lindsey, and Puri (2007)).[11] Following our previous findings (Bottazzi, Da Rin, and Hellmann (2007)), we also control for the size (VCSIZE) and age (VCAGE) of the venture investor. Following KMS we then consider the importance of international experience in venture investing (PARTNER–US–EXPERIENCE).

Our final set of variables captures the effects of deal-level characteristics. Syndication, which is common in venture investing (Lerner (1994)) is likely to result in reduced investor activity because of free-riding. Partly as a response to this (Brander, Amit and Antweiler (2002)), syndicate members delegate the responsibility for interacting with the company to a syndicate leader, who interacts with the company on their behalf. SYNDICATE–LEADER and SYNDICATE–FOLLOWER capture these different roles, which are different for each financing deal.

Finally, we control for company age (COMPANY–AGE) since companies with a shorter track record (and experience) are more likely to need both monitoring and support from the venture investor. We also control for the stage (STAGE) of the company

[11] We carefully examined the three respondents which checked the 'other ' category. One is a public university fund, and was classified as public; another is a family-controlled fund, and was classified as independent; the third is a fund owned by a government company which engages in financing for small businesses, and was classified as public.

at the date of the deal, which provides an alternative measure of its maturity and need for investor interaction. Since market conditions varied over the time period we study we include year dummies to account for the date at which a company received funding. Similarly, we control for industry.

5 Empirical Results

5.1 Main legal system effects

We are now in a position to empirically test our theoretical propositions. Our empirical base regression is as follows:

$$Y_{ic} = Legal * \beta_1 + X_i'\beta_i + X_c'\beta_c + \varepsilon_{ic}$$

where i indexes investors and c indexes companies. The dependent variables Y_{ic} measures for investor i in company c the level of INTERACTION or DOWNSIDE. We use an ordered Probit model for INTERACTION, and a simple Probit model for DOWNSIDE. X_i' is a vector of investor characteristics (INDEPENDENTVC, VCSIZE and VCAGE), and X_c' is a vector of deal characteristics (SYNDICATE-LEADER, SYNDICATE-FOLLOWER, COMPANY-AGE, STAGE, DEAL–YEAR and INDUSTRY). Since our data consists of multiple investments made by different venture capital firms, we cluster our standard errors by venture capital firms. This allows for the error term ε_{ic} to be correlated within the deals made by a venture capital firm, and imposes a conservative standard for establishing statistical significance. Clustering also implies the use of heteroskedasticity-robust standard errors. Finally, *Legal* is a legal systems measure (legal origin, rule of law index, or procedural simplicity index) either from the company's or the investor's perspective. Because the various legal indices are highly multi-collinear, the standard approach in the literature is not to estimate legal systems effects jointly. As a consequence we do not include in the same regression more than one legal measure, nor do we jointly include company and investor indices.

In Table 3, which shows the correlation matrix for the main dependent and independent variables, we note that both INTERACTION and DOWNSIDE are positively correlated with all of the legal system indices, at statistically significant levels.

Univariate correlations are informative, but they obviously do not control for other company and investor effects. Our multivariate regression model controls for a broad set of deal characteristics: syndication structure, company age, stage, industry and deal year. In terms of investor characteristics, we control for the age and size of the venture capital

firm.

Table 5 reports our empirical base model. Panel A examines the effect of legal systems on the INTERACTION variable, Panel B on the DOWNSIDE variable. We find that the legal system has a strong effect on both of these outcome variables. All coefficients are positive and statistically significant, most of them at the 1% level. The estimates also appear to be economically large. For example, the probability of downside protection is 30% higher for a common law company than for a civil law company and the probability of frequent interactions is 27% higher.[12] For the rule of law index we find, for example, that relative to a French company, a UK company's probability of downside protection by 15% higher and the probability of frequent interactions is 28% higher. The procedural index regressions produce similar magnitudes.

Whether a venture capital firm is independent or captive has a very strong effect. The coefficient for independent venture capital is positive and statistically significant both for INTERACTION and DOWNSIDE. Obtaining finance from an independent venture firm raises the probability of frequent interaction by 11% and of downside protection by 26%. This is an interesting result by itself, confirming and extending some of the prior findings on the distinction between independent and captive venture capital (Bottazzi, Da Rin, and Hellmann (2007)). Interestingly, we find that INTERACTION is larger for later stage companies. We also find that the age of venture capital firms is negative significant for INTERACTION. The prior literature sometimes interprets firm age as a proxy for quality or even investor sophistication (see, for example, Sørensen (2007) and Gompers et al. (2005)), although we caution against placing specific interpretations on age coefficients, given that age can stand for a wide variety of effects. Finally, note also that the company age has a negative relationship with downside protection.

5.2 Company versus investor legal system effects

So far our analysis establishes the importance of the legal system, but does not yet ask whether the company's or the investor's legal system matters more. In Section 3.3 we saw why from a theoretical point of view, both may matter. We now examine the empirical relevance of the respective legal systems.

We propose a new method of disentangling company and investor effects that is based on comparing two sets of fixed effect regressions. The first set of regressions uses fixed effects for the investor's country. This provides a powerful way for controlling for all aspects that relate to the investor's country, including its legal system. Controlling for this, we

[12] To calculate the economic effect for the interaction variable, which is a categorical variable, we create a dummy variable that takes value 1 if interaction is 'frequent' (i.e., monthly or weekly), and zero otherwise.

examine whether the company's legal system still retains its statistical significance. If we find that it remains significant, then we have strong evidence that it matters. If it becomes insignificant, however, we can argue that the company's legal system is actually irrelevant, once investor country characteristics are fully accounted for.

This first set of regressions probes into the effects of the company's legal system but does not speak to the importance of the investor's legal system. For this, we use a second set of regressions, which simply reverses roles. That is, we use a complete set of company country fixed effects and then examine whether the effects of the investor's legal system retain any statistical significance. This second set of regressions does not yield insights into the importance of company's legal systems, but provides us with a powerful test for the importance of the investor's legal system effects. Combining the insights from these two sets of regressions thus provides a comprehensive assessment of the relative importance of the legal system of companies and investors.[13]

Table 6 shows the results of this approach. As before, Panel A reports regressions for INTERACTION and Panel B for DOWNSIDE. The first three columns report the results for the model with investor country fixed effects. They inform us about the importance of the company's legal system. The last three columns report the results for the model with company country fixed effects, showing the importance of the investor's legal system. The results are strikingly clear. After controlling for investor country fixed effects, the estimates for the company's legal system all become statistically insignificant. In contrast, the estimates for the investor's legal system retain their size and statistical significance. This pattern is true both for the INTERACTION and DOWNSIDE regressions.[14]

This is a new and important result. It shows that in order to fully understand the effect of legal systems, looking at the company's legal system is not enough, and is possibly misleading. Our results show the greater importance of investor rather than company effects of the legal system.

The remainder of this Section looks at a number of extensions. Because of the clear message of Table 6, we omit any further discussion of companies' legal systems variables and focus on the investors' legal systems.

[13] Formally, the first approach corresponds to $Y_{ic} = Legal_c * \beta_1 + F_i' \phi_i + X_i' \beta_i + X_c' \beta_c + \varepsilon_{ic}$, where $Legal_c$ represents company's legal system variables and F_i corresponds to a vector of investor country fixed effects. The second approach can be represented as $Y_{ic} = Legal_i * \beta_1 + F_c' \phi_c + X_i' \beta_i + X_c' \beta_c + \varepsilon_{ic}$, where $Legal_i$ represents investor's legal system variables and F_c corresponds to a vector of company country fixed effects.

[14] Instead of using fixed effects for the countries of the companies or investors, one might also think of using fixed effect for the companies or investors directly. In our data we only observe a single investor for almost all of our companies, which precludes the use of company fixed effects. However, we have multiple company observations for almost all of our investors, so that we can use investor fixed effect. The results from this approach are hardly surprising. Table 6 already shows that using investor country fixed effect renders all the legal systems variables insignificant. Going to a finer-grained specification with individual investor fixed effects does not alter this conclusion.

5.3 Limited partner effects

The result that better legal systems are associated with more investor support and more downside protection are consistent with Propositions 1 and 2. Probably the most surprising finding is that the legal effects are more important at the investor than company level. Proposition 3 provides an explanation for this finding, showing how investor competencies are determined by the home country environment. As noted in Section 3.3, there may be additional channels through which investors' legal systems matter, notably through the relationship with limited partners. We gather additional data about the venture capital firms' limited partners. We find that 71% of venture capital firms have only domestic limited partners. It follows that limited partner and other investor legal system effects are likely to be intertwined, and disentangling limited partner effects is an empirical challenge. We suggest two empirical approaches.

Our first approach looks for limited partners effects by exploiting the presence of foreign limited partners. It should be mentioned up-front that this approach has a conceptual limitation, since a foreign limited partners may also be subject to the legal system of the venture capital firm. Still, we consider the possibility that the legal system of foreign limited partners may influence investment behavior. We construct limited partner legal indices for each venture capital firm. Given that a venture capital firm often has more than one limited partner, each index is computed as an average over all the firm's limited partners. In unreported regressions we find that the additional information contained in the limited partners' legal measures does not have a significant effect on our dependent variables.[15]

Our second approach focuses on the organizational structure of venture capital firms. As noted before, some venture capital firms are independent partnerships that receive their funding from limited partners in an arm's length relationship. Others are so-called captive venture capitalist firms, which are vertically integrated with their fund provider, typically banks or corporations. In our theory section we argued that a better legal system should prevent appropriation by limited partners, and therefore facilitate the formation of independent venture capital firms. This would suggest a positive relationship between the quality of the (investor) legal system and the presence of independent venture capital firms. From Table 3 we see that there is a positive and significant correlation between the quality of the legal system and the presence of independent venture partnerships. In addition to the direct effect of investors' legal systems, it thus appears that there are

[15] We consider two types of specifications. First, if we *replace* the baseline investor legal indices from Table 6 with the equivalent limited partner indices we find similar results, sometimes at lower levels of significance. Second, if we *augment* the investor level legal indices with limited partner level indices we find that the former retain their statistical significance, whereas the latter are insignificant.

indirect effects that go through the organizational structure of the venture capital firms. A better (investor) legal system promotes the formation of independent venture capital firms. Tables 5 and 6 shows that independent venture capital firms provide more support and require more downside protection. It follows that the indirect effects further reinforce the direct investor legal system effect.

5.4 Investor experience

Our analysis emphasizes the importance of the investors' legal system. As with any empirical analysis, there is a concern about unobserved factors. In this section we examine whether legal system effects can be explained by other investor characteristics. Of particular relevance is the question of whether we have properly accounted for investor characteristics relating to their experience with investing across different countries. KMS, for example, argue that investment styles are strongly influenced by whether investors have previously invested in the US.

We therefore consider some additional investor characteristics. Because we have data on individual partners, we may ask whether the professional experience of individual venture partners matters. Specifically, our survey instrument asked whether the venture firm's partners had any experience working as a venture capitalist in the US. We thus construct a variable which measures a firm's fraction of partners with previous US venture capital experience. Table 7 shows that all of the legal system coefficients remain positive and statistically significant. The direct effect of partner-level US experience is positive and statistically significant in both INTERACTION and DOWNSIDE regressions.

We also follow KMS and build two additional measure of familiarity with US investment style. First, we measure whether a venture capital firm has made any US investments. Second, we measure whether a venture firm has previously participated in a deal syndicated with a US venture firm. In unreported regressions we find that adding either of these variable does not affect the significance of any of our legal system coefficients. Moreover, the two measures themselves turn out to be statistically insignificant.[16]

These results are consistent with the emphasis KMS give to the exposure to US experience as a determinant of investment styles. While KMS stress the learning which comes from syndicating with US venture firms, we find significant effects for partners' experience as venture capitalists in the US.

[16] The same result is found when we build a dummy which measures whether a venture firms has either invested in the US or syndicated with a US firm.

5.5 Within civil countries analysis

The literature on legal systems is often focused on the distinction between common and civil law countries. This is clearly an important distinction, but it is interesting to note than even within civil law countries, there might be considerable variation in the quality of the legal system (Padilla and Requejo (2000), Spamann (2006)).

Our data allow us to extend our analysis and look at the differences within civil law countries (see La Porta et. al. (1998)). To examine such differences, we consider only the subsample of companies in civil law countries that receive financing from civil law venture capital firms. We use the rule of law and procedural complexity indices to measure the quality of the investor's legal system.

Table 8 reports the results of our regressions, which include investor legal system effects, with and without company country fixed effects. The measures of legal system quality remain statistically significant for the INTERACTION variable, suggesting that for non-contractible actions, the legal system continues to matter even with the subset of civil law countries.

In the DOWNSIDE regressions we find that the legal system coefficients remain positive, but are now statistically insignificant. Overall, while the level of significance is not as high, the pattern of how the legal system affects the choice of securities remains similar.

5.6 Simple versus sophisticated securities

The analysis so far looks at a summary measure of downside protection. In Section 3 we already noted that there exist alternative ways of implementing downside protection. One way is to use simple debt. A more sophisticated method involves the use of convertible securities. To retain its simplicity, our parsimonious theory does not try to distinguish between those two types, but the prior literature explains the advantages of such convertible securities (see, in particular, Hellmann (2006) and Schmidt (2003)). Moreover, the empirical work of LS and KMS focuses on the distinction between simple versus sophisticated contractual features. A natural question in our context is thus whether legal systems have a differential impact on the use of simple versus sophisticated securities.

Our data on securities is not as detailed as that of LS and KMS, but it still allows us to distinguish between two types of downside protection: simple debt versus more sophisticated securities such as convertible debt or preferred equity. Moreover, we can also look at which securities are used on the upside, distinguishing between the use of straight equity versus more sophisticated securities such as preferred equity or convertible debt. For this part of the analysis we use the variables CONVERTIBLE PREFERRED, DEBT and EQUITY, whose construction is described in Section 4.

Using these variables, we separately estimate the base model of Table 5 and the company country fixed effect model of Table 6. The results are reported in Panels A, B, and C of Table 9. The effects of the investor's legal system continue to be positive in all the regressions for CONVERTIBLE PREFERRED (Panel A) and for DEBT (Panel B). The significance levels are somewhat lower, with some coefficients being marginally insignificant. Still, these results suggest that the legal system effects continue to hold for both types of downside protection.

The regression results in Panel A and B are quite similar, suggesting that simple and sophisticated securities are close substitutes for implementing downside protection. To further investigate this we estimate an additional regression model not reported here. We re-run the regressions of Panel A of Table 9 comparing deals with convertible preferred only against deals that also use debt. We find that all legal variables are statistically insignificant. This is consistent with the notion that debt and convertible preferred securities are substitutes for implementing downside protection.

Panel C extends the analysis to upside gains, looking at the use of simple equity. Here, all the legal measures have a negative coefficient for EQUITY, and four out of six coefficients are statistically significant. This suggests that in better legal systems investors switch from simple equity to more sophisticated convertible preferred securities. This finding is consistent with the results of KMS and LS.

Overall, the results of Table 9 confirm our main result that a better legal system makes increased use of downside protection. They also show that, to achieve this downside protection, simple debt and more sophisticated convertible securities appear to be close substitutes. On the upside, we find that investors in better legal systems make greater use of convertible securities rather than simple equity.

5.7 Further Discussion

In this paper we develop a simple theory for how legal systems affect venture capital activities. When we take the model to the data, we find considerable empirical support. The model thus provides a simple and intuitive explanation for the empirical findings. Naturally, one may still wonder whether there are complementary or alternative explanations for our empirical results. All our unreported regressions are available upon request.

One important question is whether the legal system matters because it forbids investors to take certain actions (or write certain contracts), or because it influences, possibly in more subtle and indirect ways, what investors prefer to do—along the lines of our model. We can address this question in our context by asking whether certain investor actions, such as providing value-adding support or asking for downside protection, are actually

precluded by the legal system. The first five rows of Panel B of Table 4 tabulate our dependent variables across the four legal systems. While there are clear differences in the relative frequency of these activities, there are no cells with 0% or 100%. This shows that none of the legal systems preclude venture capitalists from doing these activities, a result also corroborated by LS. We can therefore reject one alternative interpretation of our results, that the legal systems matters because it simply doesn't allow investors to take certain actions.

As with any empirical analysis, there is always a question about whether we have controlled for enough other effects. With hand-collected data, there is an additional trade-off that adding variables comes at a cost of loosing observations. Our base specification focuses on a few important investor and company characteristics. We did several additional checks to see whether other variables affect our results.

Kaplan and Strömberg (2004) note that the size of an investor's stake affects his incentive to be involved with the company. We do not have data on equity stakes, but we have some data on the amount of money invested. Unfortunately this data is highly incomplete so that including the amount-of-money variable means using fewer than half of our sample companies. In unreported regressions we find that the amount-of-money variable has a positive and significant effect on INTERACTION, suggesting that investors with larger stakes provide more support.

Venture capitalists rely on stock markets to exit their investments. One may therefore ask whether investment behavior also depends on the liquidity of their domestic stock markets. We consider the market capitalization of the investors' and companies' domestic stock markets, which we normalize by GDP. Moreover, to account for the state of the IPO market, we also consider the number of domestic IPOs, normalized by the total number of listed companies at the end of the previous year. In unreported regression we find that these stock market liquidity variables are almost always insignificant, and that the legal systems variables almost always retain their statistical significance. Details are available upon request.

Our base model already includes calendar year controls, but one may also be concerned about industry-specific shocks. For instance, our sample period includes the "dotcom" period. We therefore performed some additional robustness checks. It might be argued that the dotcom period involved software deals that do not fit the traditional notion of a high-tech deal. When we drop all deals in the Internet and software industry we lose 30% of the observations but our results are virtually unchanged. More generally, we consider the possibility that there might be country and industry specific cycles that affect investment behaviors. We therefore compiled data from the yearbooks of the European Venture Capital Association (EVCA) and the Israeli Venture Capital Association. The data re-

ports aggregate investment amounts by country and industry, although it unfortunately aggregates venture capital and buyout investments, and it also aggregates across some of the smaller industry categories. To examine the importance of industry cycles we thus consider the country-industry-specific growth rate in the amount invested. We find that adding this control to our regressions does not alter any of our main conclusions. The industry cycle variable itself is always insignificant, and the significance of the legal index variables remains unaffected. We also consider the possibility of stage-specific cycles, i.e., the fact that there may be different cyclical variation for early versus late-stage financing. EVCA reports data by country and stage. This data does not aggregate venture capital and buyouts, but it does aggregate over all industries. When we control for stage cycles, we find again that adding this control does not affect any of our main results.[17]

We also did some robustness checks on our dependent variables. In the construction of our downside measure we used the information on the *entire set* of securities used to finance a deal. In our survey we also asked which security was the most important in the deal, i.e., we asked what the *main* security used was. We make use of this additional information and modify our downside measure to include only the main security used. When we use this alternative measure we find no significant changes in our results.

6 Conclusion

In this paper we develop a theory of how the legal system affects investor involvement and downside protection. Testing the theory on a hand-collected dataset of European venture capital deals, we confirm the model predictions. The evidence shows how the legal system affects not only the contractual, but also the non-contractual aspects of the financing relationship. These results show that the law and finance literature can gain new insights by adopting a wider perspective. Most of the existing empirical studies focus on understanding how the law determines contractual choices. We hope that our examination of non-contractual aspects provides a stimulus for further work on how legal systems affect financial intermediation more broadly.

A central finding of this paper is that the investors' legal systems seem to matter more than companies' legal systems. This is consistent with Kaplan, Martel and Strömberg (2007), who argue that investors can contract around some of the weaknesses of the companies' legal system. An additional insight here is that not all investors are equally likely to do so. In particular, our analysis shows that investors contract around these weaknesses more often when they themselves come from a stronger legal system.

[17] Note also that throughout the analysis we treat STAGE as an ordered variable. Alternatively using a set of dummies for each distinct stage does not affect any of our results.

Our evidence on the importance of legal systems for the structure of venture capital relationships also has important policy implications. The US has been widely viewed as the leading example of a modern venture capital industry. Yet, as policy makers from around the world have strived to emulate the US model, they encountered numerous problems. The prior work of Kaplan, Martel and Strömberg (2007) already establishes the importance of US style contracting for venture capital investing. Our results confirm and further extend this line of reasoning. In particular, the adoption of certain contracting practices, such as downside protection, is affected by the investor's home legal system. Investors in common law countries, for example, are more likely to use such contracts, not only at home but also when investing abroad. Moreover, the adoption of these contracting practices goes hand-in-hand with a broader involvement of investors in their companies. The quality of the investor's home country legal system thus plays a critical role in the development of a well-functioning venture capital market. The resulting policy implication is that adoption of a US-style venture capital model should become more effective when accompanied by a broader effort to improve the quality of the investor's legal system.

Appendix

Throughout the Appendix, a bar over a variable signifies one minus that variable: e.g., $\overline{\phi} = 1-\phi$. Whenever convenient, we refer to the entrepreneur as E and the venture investor as V. It is useful to define the following two variables

$$\widehat{\mu} = 1 - \mu_E - \mu_V \text{ and } \widetilde{\mu} = 1 - \mu_E\phi - \mu_V\phi$$

The ex-ante utilities are given by

$$u_E = (a-d)\overline{s} + w_E - k_E \text{ and } u_V = d + (a-d)s + w_V - k_V$$

where

$$w_E = p\pi z_E - \frac{e^2}{2} \text{and } w_V = p\pi z_V - \frac{v^2}{2}$$

and where

$$z_E = \mu_E\overline{\phi} + \widehat{\mu}\overline{s} \text{ and } z_V = \mu_V\overline{\phi} + \widehat{\mu}s.$$

We solve the model by backward induction, starting with E's and V's optimal choices of effort. Maximizing w_E w.r.t. e and w_V w.r.t. v yields

$$e = p_E\pi z_E \text{ and } v = p_V\pi z_V. \tag{2}$$

The following variables will be useful for the remainder of the model. Let

$$P_0 = p_0\pi,\ P_E = p_E^2\pi^2 \text{ and } P_V = p_V^2\pi^2.$$

Using the expressions for the optimal actions, we obtain

$$p\pi = p_0\pi + p_E e\pi + p_V v\pi = P_0 + P_E z_E + P_V z_V.$$

Using this in the above expressions for w_E and w_V we obtain

$$w_E = P_0 z_E + \frac{P_E}{2}z_E^2 + P_V z_V z_E \text{ and } w_V = P_0 z_V + \frac{P_V}{2}z_V^2 + P_E z_V z_E$$

For future reference, it us useful to define the range of values for s where the utility

frontier is downwardsloping. We note that $\frac{du_E}{ds} < 0$ provided $s > s_{\min}$, where we obtain the minimal level of equity $s_{\min}$ from $\frac{du_E}{ds} = 0$. Straightforward calculations reveal that

$$s_{\min} = Max[0, \frac{-P_0 - P_E\widehat{\mu} + P_V\widehat{\mu} - P_E\mu_E\overline{\phi} - P_V\mu_V\overline{\phi} + P_V\mu_E\overline{\phi}}{(2P_V - P_E)\widehat{\mu}}]$$

Moreover, $\frac{du_V}{ds} > 0$ provided $s > s^{\max}$, where we obtain the maximal level of equity $s^{\max}$ from $\frac{du_V}{ds} = 0$. Straightforward calculations reveal that

$$s^{\max} = Min[1, \frac{P_0 + P_E\widehat{\mu} + P_V\mu_V\overline{\phi} + P_E\mu_E\overline{\phi} - P_E\mu_V\overline{\phi}}{(2P_E - P_V)\widehat{\mu}}] \tag{3}$$

We first consider the model where the wealth constraint is not binding, i.e., where the optimal contact can be implemented with some $d < a$. If V has all the bargaining power, we have $u_E = 0$ so that

$$d = a + \frac{w_E - k_E}{\overline{s}}. \tag{4}$$

We can use this in u_V to obtain after simple transformations

$$u_V = w_E + w_V + a - k_E - k_V$$

The optimal choice of equity maximizes u_V, which is equivalent to maximizing $w_E + w_V$. The first-order condition for the optimal choice of s simplifies to $P_V z_E - P_E z_V = 0$, which yields after further transformations

$$s = \frac{P_V}{P_V + P_E} + \frac{P_V\mu_E - P_E\mu_V}{P_V + P_E}\frac{\overline{\phi}}{\widehat{\mu}} \tag{5}$$

This expression has many intuitive properties. The first term is standard in the double moral hazard literature, and shows that V's stake in related to his productivity (as measured by P_V), relative to that of E (P_E). The second term provides an adjustment of V's optimal equity stake that takes into account the relative stealing probabilities. Intuitively, the more E steals, the more V needs to increase his stake, but the more V steals, the more his stake can be reduced. Formally, we obtain the following comparative statics for

the optimal equity stake s:

$$\frac{ds}{d\mu_E} = \frac{\overline{\phi}}{\widehat{\mu}^2}(\frac{P_V}{P_E+P_V} - \mu_V) \text{ and } \frac{ds}{d\mu_V} = \frac{\overline{\phi}}{\widehat{\mu}^2}(\mu_E - \frac{P_E}{P_E+P_V}) \tag{6}$$

Note that $\frac{ds}{d\mu_E} > 0 \Leftrightarrow \mu_V < \frac{P_V}{P_E+P_V}$ and $\frac{ds}{d\mu_V} < 0 \Leftrightarrow \mu_E < \frac{P_E}{P_E+P_V}$. As long as the stealing probabilities are not too large, we obtain the above mentioned intuitive result. However, there will be no need to restrict the analysis to such lower stealing probabilities.

The optimized values of z_E and z_V are given by

$$z_E = \frac{P_E\widetilde{\mu}}{P_E+P_V} \text{and } z_V = \frac{P_V\widetilde{\mu}}{P_E+P_V}$$

Note that the condition $p < 1$ is thus given by $P_0+P_Ez_E+P_Vz_V < \pi \Leftrightarrow P_0+\frac{(P_E^2+P_V^2)\widetilde{\mu}}{P_E+P_V} < \pi$. The comparative statics of z_E and z_V are given by

$$\frac{dz_E}{d\mu_V} = \frac{dz_E}{d\mu_E} = -\frac{P_E}{P_E+P_V}\phi \text{ and } \frac{dz_V}{d\mu_V} = \frac{dz_V}{d\mu_E} = -\frac{P_V}{P_E+P_V}\phi.$$

For future reference, the optimized values of w_E and w_V are given by

$$\begin{aligned} w_E &= \frac{P_E}{P_V+P_E}[P_0\widetilde{\mu} + \frac{\widetilde{\mu}^2}{2}\frac{P_E^2+2P_V^2}{P_V+P_E}] \\ w_V &= \frac{P_V}{P_V+P_E}[P_0\widetilde{\mu} + \frac{\widetilde{\mu}^2}{2}\frac{2P_E^2+P_V^2}{P_V+P_E}] \end{aligned} \tag{7}$$

and their comparative statics are given by

$$\begin{aligned} \frac{dw_E}{d\mu_V} = \frac{dw_E}{d\mu_E} &= -\phi\frac{P_E}{P_V+P_E}(P_0 + \widetilde{\mu}\frac{P_E^2+2P_V^2}{P_V+P_E}). \\ \frac{dw_V}{d\mu_E} = \frac{dw_V}{d\mu_V} &= -\phi\frac{P_V}{P_V+P_E}(P_0 + \widetilde{\mu}\frac{2P_E^2+P_V^2}{P_V+P_E}). \end{aligned} \tag{8}$$

Proposition 1 claims that v is a decreasing function of μ_E and μ_V. From (2) we immediately obtain

$$\frac{de}{d\mu_V} = \frac{de}{d\mu_E} = -p_E\pi P_E\phi < 0 \text{ and } \frac{dv}{d\mu_V} = \frac{dv}{d\mu_E} = -p_V\pi P_V\phi < 0.$$

Note that weaker legal systems reduce not only V's but also E's equilibrium level of effort.

To examine Proposition 2, we take derivatives from equation (4) to obtain

$$\frac{dd}{d\mu_E} = \frac{w_E - k_E}{\overline{s}^2}\frac{ds}{d\mu_E} + \frac{1}{\overline{s}}\frac{dw_E}{d\mu_E} \text{ and } \frac{dd}{d\mu_V} = \frac{w_E - k_E}{\overline{s}^2}\frac{ds}{d\mu_V} + \frac{1}{\overline{s}}\frac{dw_E}{d\mu_V} \tag{9}$$

Note that $w_E - k_E = \overline{s}(d-a) < 0$. Consider first the case where $\mu_V < \frac{P_V}{P_E + P_V}$ and $\mu_E < \frac{P_E}{P_E + P_V}$ so that from (6) we have $\frac{ds}{d\mu_E} > 0$ and $\frac{ds}{d\mu_V} < 0$. We immediately note that $\frac{dd}{d\mu_E} < 0$ as stated in Proposition 2. Moreover, straightforward calculations show that $\frac{dd}{d\mu_V} < 0$ whenever

$$k_E < k_{E(1)}^{\max} \equiv w_E + \frac{\phi}{=\phi}\frac{\overline{s}\widehat{\mu}^2 P_E}{P_E - \mu_E(P_E + P_V)}(P_0 + \frac{(P_E^2 + 2P_V^2)\widetilde{\mu}}{P_V + P_E}).$$

This condition requires that k_E be not too large. Note also that from $k_E = w_E - \overline{s}(d-a)$, the highest relevant value of k_E is attained at $d = 0$, i.e., at $k_E^{d=0} = w_E + \overline{s}a$. The condition $k_E < k_{E(1)}^{\max}$ can therefore become binding only if

$$a > a_{(1)}^{d=0} \equiv \frac{\phi}{=\phi}\frac{\widehat{\mu}^2 P_E}{P_E - \mu_E(P_E + P_V)}(P_0 + \frac{(P_E^2 + 2P_V^2)\widetilde{\mu}}{P_V + P_E}).$$

Thus, for all $a \leq a_{(1)}^{d=0}$, Proposition 2 holds for all relevant values of k_E.

The results are very similar even for larger stealing probabilities. If $\mu_E > \frac{P_E}{P_E + P_V} \Leftrightarrow \frac{ds}{d\mu_V} > 0$ then we obtain $\frac{dd}{d\mu_V} < 0$ without ever requiring any condition on k_E. If $\mu_V > \frac{P_V}{P_E + P_V} \Leftrightarrow \frac{ds}{d\mu_E} < 0$, then straightforward calculations reveal that the results that $\frac{dd}{d\mu_E} < 0$ requires the following condition on k_E:

$$k_E < k_{E(2)}^{\max} \equiv w_E + \frac{\phi}{=\phi}\frac{\overline{s}\widehat{\mu}^2 P_E}{\mu_V(P_E + P_V) - P_V}(P_0 + \frac{(P_E^2 + 2P_V^2)\widetilde{\mu}}{P_V + P_E})$$

Again, this condition can only become binding for

$$a > a_{(2)}^{d=0} \equiv \frac{\phi}{=\phi}\frac{\widehat{\mu}^2 P_E}{\mu_V(P_E + P_V) - P_V}(P_0 + \frac{(P_E^2 + 2P_V^2)\widetilde{\mu}}{P_V + P_E}).$$

We now turn to the model where the wealth constraint is binding, so that $d = a$. In this case, V chooses s so that $u_E = w_E - k_E = 0$. Partially differentiating w.r.t. s we obtain

$$\frac{\partial w_E}{\partial s} = -\widehat{\mu}[P_0 + P_E z_E + P_V z_V - P_V z_E]$$

where we note that $\frac{\partial w_E}{\partial s} > 0$ whenever $s > s_{\min}$, which is always true in the constrained model.

As a next step, we consider the partial derivative of u_E w.r.t. μ_E and μ_V. Straightforward calculations reveal that

$$\begin{aligned}\frac{\partial w_E}{\partial \mu_E} &= (P_0 + P_E z_E + P_V z_V - P_V z_E)s - (P_0 + P_E z_E + P_V z_V)\phi \\ \frac{\partial w_E}{\partial \mu_V} &= -(P_0 + P_E z_E + P_V z_V - P_V z_E)\overline{s} - P_V z_E \phi\end{aligned}$$

We combine these results with $\frac{du_E}{d\mu_E} = \frac{\partial w_E}{\partial \mu_E} + \frac{\partial w_E}{\partial s}\frac{ds}{d\mu_E} = 0$ to obtain

$$\frac{ds}{d\mu_E} = \frac{s-\phi}{\widehat{\mu}} - \frac{\phi}{\widehat{\mu}}\frac{P_V z_E}{P_0 + P_E z_E + P_V z_V - P_V z_E}$$

and similarly

$$\frac{ds}{d\mu_V} = -\frac{\overline{s}}{\widehat{\mu}} - \frac{\phi}{\widehat{\mu}}\frac{P_V z_E}{P_0 + P_E z_E + P_V z_V - P_V z_E}$$

For Proposition 1 we note that $\frac{dz_V}{d\mu_E} = -s + \widehat{\mu}\frac{\partial s}{\partial \mu_E}$ and $\frac{dz_V}{d\mu_V} = \overline{\phi} - s + \widehat{\mu}\frac{\partial s}{\partial \mu_V}$. Using the above we obtain after transformations

$$\frac{dz_V}{d\mu_E} = \frac{dz_V}{d\mu_V} = -\phi - \frac{P_V z_E \phi}{P_0 + P_E z_E + P_V z_V - P_V z_E} < 0$$

It immediately follows that $\frac{dv}{d\mu_E} = p_E \pi \frac{dz_V}{d\mu_E} < 0$ and $\frac{dv}{d\mu_V} = p_V \pi \frac{dz_V}{d\mu_V} < 0$, which proves that Proposition 1 continues to hold in the constrained model.

We also consider the case where $s = s^{\max}$ as defined in (3). Straightforward differentiation yields

$$\begin{aligned}\frac{ds^{\max}}{d\mu_E} &= \frac{P_0 + P_E\overline{\phi} - (2P_E - P_V)\mu_V\overline{\phi}}{(2P_E - P_V)\widehat{\mu}^2} \\ \frac{ds^{\max}}{d\mu_V} &= \frac{P_0 + P_V\overline{\phi} - P_E\overline{\phi} + (2P_E - P_V)\mu_E\overline{\phi}}{(2P_E - P_V)\widehat{\mu}^2}\end{aligned}$$

Note that $2P_E - P_V > 0$ whenever $s^{\max} < 1$. After further transformations we obtain

$$\frac{dz_V}{d\mu_E} = \frac{dz_V}{d\mu_V} = \frac{-P_E\phi}{2P_E - P_V} < 0.$$

Again we have $\frac{dv}{d\mu_E} = p_E\pi\frac{dz_V}{d\mu_E} < 0$ and $\frac{dv}{d\mu_V} = p_V\pi\frac{dz_V}{d\mu_V} < 0$, so that Proposition 1 continues to hold. Proposition 2 obviously does not apply to the constrained model where $d = a$.

We now turn to Proposition 3. We only provide the proof for the unconstrained model. V maximizes $U_V = \int w_V(\mu_E, \mu_V, x)d\Omega(\mu_E, \mu_V, x) - C_V(p_V)$, so that the first-order condition is given by $\int \frac{du_V}{dp_V}d\Omega(\mu_E, \mu_V, x) = C_V'(p_V)$. The left-hand side expression is decreasing for any first-order stochastic distribution of μ_E (μ_V) if $\frac{d^2w_V}{dp_V d\mu_E} < 0$ ($\frac{d^2w_V}{dp_V d\mu_V} < 0$).

To show that this condition holds, we use $\frac{dw_V}{d\mu_E}$ and $\frac{dw_V}{d\mu_V}$ from (8) and then take the cross-derivative w.r.t. p_V. Naturally, $\frac{d^2w_V}{dp_V d\mu_E} < 0 \Leftrightarrow \frac{d^2w_V}{dP_V d\mu_E} < 0$. Tedious but straightforward calculations reveal that

$$\frac{d^2w_V}{d\mu_E dP_V} = \frac{d^2w_V}{d\mu_V dP_V} = -\phi P_0\frac{P_E}{(P_V + P_E)^2} - \phi\widetilde{\mu}\frac{P_V^3 + 2P_E^3 + 3P_V^2P_E - 2P_VP_E^2}{(P_V + P_E)^3} < 0$$

For the second part of Proposition 3 we take a derivative of $v = p_V\pi z_V$ w.r.t. p_V and obtain $\frac{dv^*}{dp_V} = p_V\pi\frac{dz_V}{dp_V} + \pi z_V > 0$ since $\frac{dz_V}{dp_V} \sim \frac{dz_V}{dP_V} \sim \frac{P_E}{(P_V + P_E)^2} > 0$. This shows that V's support is increasing in p_V.

For the effect on debt, we obtain from (4)

$$\frac{dd^*}{dP_V} = \frac{w_E - k_E}{\overline{s}^2}\frac{ds}{dP_V} + \frac{1}{\overline{s}}\frac{dw_E}{dP_V}$$

From (5) we obtain after transformations

$$\frac{ds}{dP_V} = \frac{P_E}{(P_V + P_E)^2}\frac{\widetilde{\mu}}{\widehat{\mu}} > 0$$

and from (7) we obtain after transformations

$$\frac{dw_E}{dP_V} = -\frac{P_0P_E\widetilde{\mu}}{(P_V + P_E)^2} + \frac{(2P_V + P_E)P_E^2\widetilde{\mu}^2}{(P_V + P_E)^3}$$

Straightforward calculations reveal that the condition $\frac{dd^*}{dP_V} > 0$ is satisfied whenever

$$k_E < k_{E(3)}^{\max} \equiv w_E + \overline{s}\widehat{\mu}(\frac{(2P_V + P_E)P_E\widetilde{\mu}}{P_V + P_E} - P_0)$$

This condition can only be binding for

$$a > a_{(3)}^{d=0} \equiv \widehat{\mu}(\frac{(2P_V + P_E)P_E\widetilde{\mu}}{P_V + P_E} - P_0).$$

Note that in the main text we simplify the exposition by stating a sufficient condition which only uses a single upper bound on $k_E^{\max}$. This is simply given by $k_E^{\max} = Min[k_{E(1)}^{\max}, k_{E(2)}^{\max}, k_{E(3)}^{\max}]$. The same can be done for $a^{d=0} = Min[a_{(1)}^{d=0}, a_{(2)}^{d=0}, a_{(3)}^{d=0}]$.

To see the importance of bargaining power, suppose instead that d^* is determined by the generalized Nash bargaining solution, where β measures the venture capitalist's bargaining power. The Nash solution maximizes $u_V^{\beta}u_E^{1-\beta}$, which yields after standard transformations the following first order condition: $\beta u_E - (1-\beta)u_V = 0 \Leftrightarrow$

$$\beta(w_E - k_E) - (1-\beta)(w_V - k_V) + (\beta - s)a - d\overline{s} = 0$$

Totally differentiating we obtain

$$\beta\frac{du_E}{d\mu_E} - \overline{\beta}\frac{du_V}{d\mu_E} - \frac{ds}{d\mu_E}(a-d) - \frac{dd}{d\mu_E}\overline{s} = 0$$

and thus

$$\frac{dd}{d\mu_E} = \frac{1}{\overline{s}}[\beta\frac{du_E}{d\mu_E} - \overline{\beta}\frac{du_V}{d\mu_E} - \frac{ds}{d\mu_E}(a-d)]$$

Using equations (6) and (8) we obtain after transformations $\frac{dd}{d\mu_E} < 0 \Leftrightarrow \beta > \widehat{\beta}_E$ where

$$\widehat{\beta}_E \equiv \frac{\frac{P_V}{P_V + P_E}(P_0 + \widetilde{\mu}\frac{2P_E^2 + P_V^2}{(P_V + P_E)^2}) + (\frac{P_V}{P_E + P_V} - \mu_V)\frac{\overline{\phi}}{\phi\widehat{\mu}^2}\frac{w_E - k_E}{\overline{s}}}{P_0 + \widetilde{\mu}\frac{P_V^3 + P_E^3 + 2P_V^2P_E + +2P_VP_E^2}{(P_V + P_E)^2}}$$

Note that for some parameter constellations is it possible that $\widehat{\beta}_E < 0$ in which case the condition $\beta > \widehat{\beta}_E$ is redundant. Using analogous reasoning, we also find that $\frac{dd}{d\mu_V} < 0 \Leftrightarrow$

$\beta > \widehat{\beta}_V$ where

$$\widehat{\beta}_V = \frac{\frac{P_V}{P_V+P_E}(P_0 + \widetilde{\mu}\frac{2P_E^2+P_V^2}{(P_V+P_E)^2}) + (\mu_E - \frac{P_E}{P_E+P_V})\frac{\overline{\phi}}{\phi\widehat{\mu}^2}\frac{w_E-k_E}{\overline{s}}}{P_0 + \widetilde{\mu}\frac{P_V^3+P_E^3+2P_V^2P_E+2P_VP_E^2}{(P_V+P_E)^2}}$$

Overall we conclude that Proposition 2 continues to be valid whenever $\beta > Max[\widehat{\beta}_E, \widehat{\beta}_V]$.

Finally, we consider a specification, where the efforts of the entrepreneur and investor are complementary. We use linear effort costs e and v, and a Cobb-Douglas like probability of success $p = \gamma e^\alpha v^\beta$. For a well-behaved solution we require $\alpha+\beta < 1$, implying decreasing returns to effort. It turns out that in our model the parameter γ always gets multiplied with π, so that w.l.o.g. we can set $\gamma = 1$. Unfortunately the model with $\alpha \neq \beta$ is not tractable. We therefore limit the analysis to the special case where $\alpha = \beta$. In this model we have

$$w_E = p\pi z_E - e = e^\alpha v^\beta \pi z_E - e \text{ and } w_V = p\pi z_V - v = e^\alpha v^\beta \pi z_V - v$$

The optimal effort choices are given by the following first-order conditions.

$$\alpha e^{\alpha-1} v^\alpha \pi z_E = 1 \text{ and } \beta e^\alpha v^{\alpha-1} \pi z_V = 1$$

Standard manipulations reveal that

$$v = \alpha^{\frac{1}{1-2\alpha}} z_V^{\frac{1-\alpha}{1-2\alpha}} z_E^{\frac{\alpha}{1-2\alpha}} \pi^{\frac{1}{1-2\alpha}} \text{ and } e = \alpha^{\frac{1}{1-2\alpha}} z_V^{\frac{\alpha}{1-2\alpha}} z_E^{\frac{1-\alpha}{1-2\alpha}} \pi^{\frac{1}{1-2\alpha}}$$

which implies after further transformations

$$\begin{aligned} p &= \alpha^{\frac{\alpha}{1-2\alpha}} \beta^{\frac{\alpha}{1-2\alpha}} z_V^{\frac{\alpha}{1-2\alpha}} z_E^{\frac{\alpha}{1-2\alpha}} \pi^{\frac{2\alpha}{1-2\alpha}} \\ w_E &= z_V^{\frac{\alpha}{1-2\alpha}} z_E^{\frac{1-\alpha}{1-2\alpha}} \pi^{\frac{1}{1-2\alpha}} \alpha^{\frac{\alpha}{1-2\alpha}} (\alpha^{\frac{\alpha}{1-2\alpha}} - \alpha^{\frac{1-\alpha}{1-2\alpha}}) \\ w_V &= z_V^{\frac{1-\alpha}{1-2\alpha}} z_E^{\frac{\alpha}{1-2\alpha}} \pi^{\frac{1}{1-2\alpha}} \alpha^{\frac{\alpha}{1-2\alpha}} (\alpha^{\frac{\alpha}{1-2\alpha}} - \alpha^{\frac{1-\alpha}{1-2\alpha}}) \end{aligned}$$

For the optimal contract consider first the model without wealth constraints. The optimal contract maximizes $w_E + w_V$. Thanks to the symmetric structure of the model, the first-order condition for the optimal choice of s simplifies to $z_V = z_E$, which then implies

$$s^* = \frac{1}{2} + \frac{\mu_E - \mu_V}{2\widehat{\mu}}\overline{\phi} \tag{10}$$

With this, we obtain $z_E = z_V = \frac{\widetilde{\mu}}{2}$ which also implies

$$w_E = w_V = (\frac{\widetilde{\mu}}{2})^{\frac{1}{1-2\alpha}} \pi^{\frac{1}{1-2\alpha}} \alpha^{\frac{\alpha}{1-2\alpha}} (\alpha^{\frac{\alpha}{1-2\alpha}} - \alpha^{\frac{1-\alpha}{1-2\alpha}}). \tag{11}$$

For Proposition 1 we note that $v = \alpha^{\frac{1}{1-2\alpha}} \pi^{\frac{1}{1-2\alpha}} (\frac{\widetilde{\mu}}{2})^{\frac{1}{1-2\alpha}}$ so that $\frac{dv}{d\mu_E} = \frac{dv}{d\mu_V} = -\frac{\phi}{\widetilde{\mu}} \frac{v}{1-2\alpha} < 0$.

For Proposition 2 we use again equation (9). To obtain an expression for $\frac{ds}{d\mu_E}$ we differentiate (10) an obtain

$$\frac{ds}{d\mu_E} = (\frac{1}{2} - \mu_V) \frac{\overline{\phi}}{\widehat{\mu}^2} \text{ and } \frac{ds}{d\mu_V} = -(\frac{1}{2} - \mu_E) \frac{\overline{\phi}}{\widehat{\mu}^2}.$$

Note that $\frac{ds}{d\mu_E} > 0 \Leftrightarrow \mu_V < \frac{1}{2}$ and $\frac{ds}{d\mu_V} < 0 \Leftrightarrow \mu_E < \frac{1}{2}$, which we assume for simplicity. From (11) we obtain

$$\frac{dw_E}{d\mu_E} = \frac{dw_E}{d\mu_V} = -\frac{\phi}{\widetilde{\mu}} \frac{w_E}{1-2\alpha} < 0$$

Thus, using $w_E - k_E < 0$ as before we obtain

$$\frac{dd}{d\mu_E} = \frac{w_E - k_E}{\overline{s}^2} (\frac{1}{2} - \mu_V) \frac{\overline{\phi}}{\widehat{\mu}^2} - \frac{1}{\overline{s}} \frac{\phi}{\widetilde{\mu}} \frac{w_E}{1-2\alpha} < 0.$$

Moreover,

$$\frac{dd}{d\mu_V} = -\frac{w_E - k_E}{\overline{s}^2} (\frac{1}{2} - \mu_E) \frac{\overline{\phi}}{\widehat{\mu}^2} - \frac{1}{\overline{s}} \frac{\phi}{\widetilde{\mu}} \frac{w_E}{1-2\alpha}$$

We note that $\frac{dd}{d\mu_V} < 0 \Leftrightarrow k_E < k_E^{\max} \equiv w_E + \frac{\overline{s}\widetilde{\mu}}{(\frac{1}{2} - \mu_E)} \frac{\phi}{\overline{\phi}} \frac{w_E}{1-2\alpha}$.

For the model with a wealth constraint, we maximize w_V s.t. $w_E = k_E$. To show that v is decreasing in μ_E and μ_V, it suffices to show that $\frac{dz_V}{d\mu_E} < 0$ and $\frac{dz_V}{d\mu_V} < 0$. For this we first derive $\frac{ds}{d\mu_E}$ and $\frac{ds}{d\mu_V}$. We obtain this from totally differentiating $w_E = k_E$. After tedious calculations be obtain

$$\frac{ds}{d\mu_E} = \frac{1}{\widehat{\mu}} \frac{(s-\phi)(1-\alpha) z_V - s\alpha z_E}{(1-\alpha) z_V - \alpha z_E} \text{ and } \frac{ds}{d\mu_V} = \frac{1}{\widehat{\mu}} \frac{\alpha z_E (\overline{\phi} - s) - (1-\alpha) z_V \overline{s}}{(1-\alpha) z_V - \alpha z_E}.$$

Using $\frac{dz_V}{d\mu_E} = -s + \widehat{\mu}\frac{ds}{d\mu_E}$ and $\frac{dz_V}{d\mu_V} = \overline{\phi} - s + \widehat{\mu}\frac{ds}{d\mu_V}$we obtain

$$\frac{dz_V}{d\mu_E} = \frac{dz_V}{d\mu_V} = \frac{-\phi(1-\alpha)z_V}{(1-\alpha)z_V - \alpha z_E} < 0$$

Finally, we consider the model where $s = s^{\max}$. Standard calculations reveal that

$$s^{\max} = (1-\alpha) + \frac{(1-\alpha)\mu_E\overline{\phi} - \alpha\mu_V\overline{\phi}}{\widehat{\mu}}$$

which in turn implies after further calculations $z_V = (1-\alpha)\widetilde{\mu}$ and thus

$$\frac{dz_V}{d\mu_E} = \frac{dz_V}{d\mu_V} = -\phi(1-\alpha) < 0$$

which again confirms Proposition 1.

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Table 1: Sample properties

This table compares our sample to the population it is drawn from. Panel A looks at the country composition and response rates, Panel B at the composition by venture firm type, and Panel C at the size composition. Variables are defined in Section 3. Partners are measured in units, the amount managed in million of current euros.

Panel A: COUNTRY COMPOSITION AND RESPONSE RATE

	POPULATION	SAMPLE	RESPONSE RATE
Austria	23	8	34.8%
Belgium	34	4	11.8%
Denmark	29	4	13.8%
Finland	33	6	18.2%
France	101	14	13.9%
Germany	146	19	13.0%
Greece	8	4	50.0%
Ireland	15	3	20.0%
Italy	37	5	13.5%
Luxembourg	3	1	33.3%
The Netherlands	52	4	7.7%
Norway	22	2	9.1%
Portugal	10	2	20.0%
Spain	38	10	26.3%
Sweden	17	6	35.3%
Switzerland	43	6	14.0%
UK	139	21	15.1%
TOTAL	*750*	*119*	*15.8%*

Panel B: COMPOSITION BY VENTURE FIRM TYPE

	POPULATION	SAMPLE
Independent	65.7%	68.8%
Corporate	8.0%	9.4%
Bank	19.3%	16.8%
Public	6.9%	5.1%

Panel C: COMPOSITION BY SIZE

POPULATION				
	Mean	Median	Min.	Max.
Number of partners	4.3	3	1	25
Amount managed	333.4	60	1	14,200
SAMPLE				
	Mean	Median	Min.	Max.
Number of partners	4.2	3	1	20
Amount managed	182.8	50	2	4,500

Table 2: Variable definitions

Table 2(a): Dependent variables

These variables are measured at the portfolio company level.

Variable	Description
INTERACTION	is an ordered variable that takes values 1 to 4 if the venture capital firm is reported to interact with the company on a weekly, monthly, quarterly, or annual basis, respectively. We obtain the data from our survey instrument, which asked: *How many times per year does (did) the responsible partner(s)/manager(s) personally interact with this company? (check one).* Possible answers were: *annually; quarterly; monthly; weekly.*
DOWNSIDE	dummy variable that takes the value 1 if the instruments used for financing the company includes one of the following: straight debt, convertible debt or preferred equity; 0 otherwise. We obtain the data from our survey instrument, which asked: *Which of the following financial instruments has your firm used to finance this company?* Possible answers were: *common equity; straight debt; convertible debt; preferred equity; warrants.*
CONVERTIBLE PREFERRED	dummy variable that takes the value 1 if the deal includes convertible debt or preferred equity, and 0 otherwise.
DEBT	dummy variable that takes the value 1 if the deal includes straight debt, and 0 otherwise.
EQUITY	dummy variable that takes the value 1 if the deal includes common equity, and 0 otherwise.

Table 2(b): Independent variables: Legal origin and legal indices

These variables are measured at the portfolio company or investor level.

Variable	Description
COMPANY–COMMON	dummy variable that takes the value 1 if the company is located in a legal system of common law (from LaPorta et al. (1998)), and 0 otherwise.
COMPANY–RULE	measure of the quality of enforcement of legal rules in the country of the company based on an on an index ranging from –2.5 to 2.5 developed by the World Bank and described in Kaufman et al. (2002).
COMPANY–PROCEDURAL	measure of the degree of legal formalism of the legal system of the portfolio company based on an index ranging from 0 to 100, from the World Bank Doing Business database for the year 2000. This index is discussed in Djankov et al. (2002) and is published by the World Bank's 'Doing Business' project. In order to make our results easier to interpret, this measure is rescaled by subtracting the original value from 100, so that a higher value corresponds to a less formal (i.e., better) legal system.
INVESTOR–COMMON	dummy variable that takes the value 1 if the investor's main office is located in a legal system of common law (from LaPorta et al. (1998)), and 0 otherwise.
INVESTOR–RULE	measure of the quality of enforcement of legal rules in the country of the investor based on an on an index ranging from –2.5 to 2.5 developed by the World Bank and described in Kaufman et al. (2002).
INVESTOR–PROCEDURAL	measure of the degree of legal formalism of the legal system of the investor based on an index ranging from 0 to 100, from the World Bank Doing Business database for the year 2000. This index is discussed in Djankov et al. (2002) and is published by the World Bank's 'Doing Business' project. In order to make our results easier to interpret, this measure is rescaled by subtracting the original value from 100, so that a higher value corresponds to a less formal (i.e., better) legal system.

Table 2(c): Independent variables: venture firm variables

These variables are measured at the investor level.

Variable	Description
INDEPENDENT-VC	dummy variable that takes the value 1 if the venture capitalist defines itself as an independent venture firm; 0 otherwise.
VC–SIZE	amount of capital under management of the venture capital firm at the end of the sample period (2001), in millions of current euros. We obtain the data by directly contacting respondent companies after receiving their main answers. For those firms for which we had not received the information directly we gathered the data from commercial databases, company websites and industry sources.
VC–AGE	age of the venture capital firm, measured in months at the end of the sample period. We obtain the data from our survey instrument, which asked: *Indicate the date of creation of your firm (mm/yy)*. For those firms for which we had not received the information directly we gathered the data from commercial databases, company websites and industry sources.
PARTNER–US–EXPERIENCE	the fraction of the venture firm's partners who have prior experience as venture partners in the US.

Table 2(d): Independent variables: company and deal variables

These variables are measured at the company and deal level.

Variable	Description
SYNDICATE–LEADER	dummy variable that takes the value 1 if the company is financed with a syndicated deal and the venture capital firm is the leader of the syndicate; 0 otherwise. We obtain the data from our survey instrument, which asked: *If the deal was syndicated, was your firm the lead investor?* Possible answers were: *Yes; No.*
SYNDICATE–FOLLOWER	dummy variable that takes the value 1 if the company is financed with a syndicated deal and the venture capital firm is not the leader of the syndicate; 0 otherwise. We obtain the data from our survey instrument, which asked: *If the deal was syndicated, was your firm the lead investor?* Possible answers were: *Yes; No.*
COMPANY–AGE	age of the company, measured in months at the time of the deal. We obtain the data from our survey instrument , which asked (for each company): *Indicate the date of creation of the company (mm/yy), Indicate the date of your first round of financing to this company (mm/yy).*
STAGE	ordered variable that takes the values 1 to 4 if a deal is reported as seed, start-up, expansion or bridge. We obtain the data from our survey instrument, which asked: *Indicate the type of your first round of financing to this company (check one).* Possible answers were: *Seed; Start-up; Expansion; and Bridge.*
DEAL–YEAR	set of four dummy variables each of which takes the value 1 if a deal took place in 1998, 1999, 2000, or 2001 (respectively); 0 otherwise. We obtain the data from our survey instrument, which asked: *Indicate the date of your first round of financing to this company (mm/yy).*
INDUSTRY	set of a dummy variables that take the value 1 if the company is reported to operate in one the following industries; 0 otherwise. We obtain the data from our survey instrument, which gave the following options: *Biotech and pharma; Medical products; Software and internet; Financial services; Industrial services; Electronics; Consumer services; Telecom; Food and consumer goods; Industrial products (incl. energy); Media & Entertainment; Other.*

Table 3: Pairwise correlations

Correlations significant at the 1%, 5% and 10% level are identified by ***, **, *.

	INTER-ACTION	DOWN-SIDE	COMP. COMMON	COMP. RULE	COMP. PROCED.	INVES. COMMON	INVEST. RULE	INVEST . PROCED.	INDEP. VC	VC SIZE	VC AGE
INTERACTION	1.000										
DOWNSIDE	0.106***	1.000									
COMPANY–COMMON	0.145***	0.264***	1.000								
COMPANY–RUE	0.301***	0.197***	0.337***	1.000							
COMPANY–PROCED.	0.335***	0.224***	0.587***	0.758***	1.000						
INVESTOR–COMMON	0.195***	0.287***	0.813***	0.305***	0.499***	1.000					
INVESTOR–RULE	0.378***	0.209***	0.293***	0.884***	0.677***	0.358***	1.000				
INVESTOR–PROCED.	0.450***	0.248***	0.492***	0.670***	0.884***	0.599***	0.755***	1.000			
INDEPEND.–VC	0.295***	0.208***	0.167***	0.187***	0.212***	0.163***	0.202***	0.323***	1.000		
VC–SIZE	–0.117***	–0.022	–0.083***	–0.052**	–0.114***	–0.089***	–0.034	–0.116***	–0.113***	1.000	
VC–AGE	0.374***	0.174***	0.039	–0.013	–0.044	–0.034	–0.088***	–0.166***	–0.095***	0.098***	1.000
NO–SYNDICATE	0.011	–0.066**	0.043	0.051*	0.039	0.024	–0.009	–0.010	0.124***	–0.025	0.051*
SYND–LEAD.	0.106***	0.012	–0.025	–0.045	–0.074**	0.035	0.012	–0.019	–0.041	0.015	–0.163***
SYND–FOLL.	–0.097***	0.058**	–0.022	–0.008	0.026	–0.055	0.002	0.018	–0.156***	0.011	0.093***
COMPANY–AGE	–0.117***	–0.057*	–0.056*	–0.107***	–0.052*	–0.039	–0.089***	–0.036	–0.068**	–0.029	0.074**
STAGE	0.025	–0.037	0.062**	–0.042	0.039	0.101***	–0.011	0.064**	–0.098***	0.091***	0.059**
DEAL–1998	0.055*	0.002	0.034	0.046*	0.042	0.007	0.023	0.018	–0.038	–0.025	0.118***
DEAL–1999	–0.080***	0.003	–0.057**	–0.066**	–0.079***	–0.059**	–0.073***	–0.079***	–0.019	0.043	0.053*
DEAL–2000	0.074**	–0.009	0.010	0.003***	0.003	0.041	0.023	0.029	0.073***	–0.002	–0.118***
DEAL–2001	0.028	0.006	0.015	0.023	0.036	0.004	0.025	0.028	–0.033	–0.019	0.009

Table 3 (continued): Pairwise correlations

	NO SYND.	SYND. LEAD.	SYND. FOLL.	COMP. AGE	STAGE	DEAL 1998	DEAL 1999	DEAL 2000	DEAL 2001
NO–SYNDICATE	1.000								
SYND–LEAD.	–0.428***	1.000							
SYND–FOLL.	–0.636***	–0.427***	1.000						
COMPANY–AGE	–0.051*	–0.055*	–0.008	1.000					
STAGE	0.040	–0.086***	0.035	0.039***	1.000				
DEAL–1998	0.070**	0.076**	–0.006	0.034	–0.035	1.000			
DEAL–1999	0.018	0.001	0.019	0.034	0.059**	–0.195***	1.000		
DEAL–2000	0.024	0.020	–0.042	–0.051*	–0.068**	–0.289***	–0.400***	1.000	
DEAL–2001	0.093***	0.034	0.067*	–0.001	0.045	–0.241***	–0.333***	–0.495***	1.000

Table 4: Descriptive statistics

This table provides descriptive statistics for all our dependent and independent variables. Panel A provides descriptive statistics. For dummy variables the MEAN column reports the frequency of observations. Panel B provides mean values (frequencies for dummy variables) by legal system of the company. Since we count all the securities used in a deal, their frequencies may sum to more than 1. Variables are defined in Section 4.

Panel A: DESCRIPTIVE STATISTICS

VARIABLE	MEAN	MEDIAN	MIN	MAX	*OBS*
Interaction	2.972	3	1	4	*1,252*
Downside	0.451	–	0	1	*1,392*
Convertible Preferred	0.375	–	0	1	*1,392*
Debt	0.097	–	0	1	*1,392*
Equity	0.745	–	0	1	*1,387*
Company–Common	0.160	–	0	1	*1,429*
Company–Rule	1.759	1.900	0.660	2.360	*1,429*
Company–Procedural	41.356	39.000	17.000	64.000	*1,423*
Investor–Common	0.160	–	0	1	*1,429*
Investor–Rule	1.747	1.900	0.660	2,360	*1,429*
Investor–Procedural	40.931	39.000	17.000	64.000	*1,422*
IndependentVC	0.580	–	0	1	*1,429*
VC–Size	244	85	1	4,500	*1,417*
VC–Age	94	54	12	390	*1,429*
Partner–US–Experience	0.045	–	0	1	*1,381*
No–Syndicate	0.390	–	0	1	*1,134*
Syndicate–Leader	0.225	–	0	1	*1,134*
Syndicate–Follower	0.385	–	0	1	*1,134*
Company–Age	56.509	24	0	41,179	*1,181*
Stage	2.253	2	1	4	*1,303*
Deal–1998	0.220	-	0	1	*1,297*
Deal–1999	0.212	-	0	1	*1,297*
Deal–2000	0.373	-	0	1	*1,297*
Deal–2001	0.291	-	0	1	*1,297*
Biotech and pharma	0.139	-	0	1	*1,417*
Medical products	0.067	-	0	1	*1,417*
Software and Internet	0.303	-	0	1	*1,417*
Financial services	0.037	-	0	1	*1,417*
Industrial services	0.039	-	0	1	*1,417*
Electronics	0.058	-	0	1	*1,417*
Telecom	0.072	-	0	1	*1,417*
Consumer services	0.123	-	0	1	*1,417*
Food and consumer goods	0.023	-	0	1	*1,417*
Industrial products	0.014	-	0	1	*1,417*
Media & entertainment	0.065	-	0	1	*1,417*
Other industries	0.059	-	0	1	*1,417*

Panel B: MEAN VALUES, BY LEGAL SYSTEM

	Common	Civil			
VARIABLE	Anglo-Saxon	French	German	Scandinavian	*Obs*
Interaction	3.229	2.658	3.155	3.204	*1,252*
Downside	0.748	0.358	0.337	0.546	*1,392*
Convertible Preferred	0.550	0.314	0.264	0.506	*1,392*
Debt	0.251	0.053	0.091	0.068	*1,392*
Equity	0.541	0.754	0.876	0.738	*1,387*
Company–Common	1	–	–	–	*1,429*
Company–Rule	2.024	1.415	1.984	2.024	*1,429*
Company–Procedural	63.345	26.639	42.030	55.139	*1,423*
Investor–Common	0.842	0.028	0.028	0.036	*1,429*
Investor–Rule	1.979	1.432	1.942	2.014	*1,429*
investor–Procedural	59.489	27.715	41.267	54.836	*1,422*
IndependentVC	0.768	0.248	0.673	0.581	*1,429*
VC-Size	127	345	199	177	*1,417*
VC-Age	102	106	77	82	*1,429*
No–Syndicate	0.440	0.387	0.395	0.341	*1,134*
Syndicate–Leader	0.203	0.250	0.220	0.191	*1,134*
Syndicate–Follower	0.357	0.363	0.385	0.468	*1,134*
Partner–US–Experience	0.052	0.036	0.058	0.046	*1,382*
Company–Age	44.057	71.222	48.861	44.537	*1,181*
Stage	2.366	2.288	2.173	2.180	*1,303*

Table 5: Base model

This Table reports results from (ordered) Probit regressions for our base model described in Section 5.1. The dependent variables are INTERACTION in Panel A and DOWNSIDE in Panel B. For each Panel, columns *(i)* through *(vi)* report estimates for models whose main independent variable is a different measure of company, or investor, legal system. All models also include investor and deal controls. Investor controls are INDEPENDENTVC, VC–AGE, and VC–SIZE. Deal Controls are COMPANY–AGE, STAGE, SYNDICATE–FOLLOWER, and SYNDICATE–LEADER (reported), and DEAL–YEAR and INDUSTRY dummies (unreported). Variables are defined in Section 4. For each independent variable, we report the estimated coefficient and the t-ratio (in parenthesis), computed using heteroskedasticity-robust standard errors, clustered by venture firm. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

Panel A: INTERACTION

	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*
Company–Common	0.369**					
	(0.18)					
Company–Rule		0.892***				
		(0.26)				
Company–Procedural			0.021***			
			(0.01)			
Investor–Common				0.489**		
				(0.21)		
Investor–Rule					1.058***	
					(0.26)	
Investor–Procedural						0.029***
						(0.01)
IndependentVC	0.537**	0.479**	0.444**	0.526**	0.444**	0.381*
	(0.22)	*(0.21)*	*(0.20)*	*(0.22)*	*(0.20)*	*(0.20)*
VC–Age	-0.006***	-0.006***	-0.005***	-0.005***	-0.005***	-0.005***
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
VC–Size	-0.000	-0.000*	-0.000	-0.000	-0.000**	-0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Syndicate–Follower	-0.070	-0.018	-0.051	-0.067	-0.040	-0.077
	(0.21)	*(0.20)*	*(0.20)*	*(0.21)*	*(0.20)*	*(0.20)*
Syndicate–Leader	0.194	0.244	0.241	0.185	0.202	0.204
	(0.22)	*(0.20)*	*(0.19)*	*(0.22)*	*(0.20)*	*(0.19)*
Company–Age	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Stage	0.213*	0.223**	0.200**	0.198*	0.202*	0.169*
	(0.12)	*(0.11)*	*(0.10)*	*(0.12)*	*(0.11)*	*(0.10)*
Year and Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	*811*	*811*	*805*	*811*	*811*	*804*
χ^2	*109.04*	*161.50*	*212.50*	*102.82*	*156.20*	*187.60*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.128*	*0.148*	*0.157*	*0.133*	*0.158*	*0.168*

Panel B: DOWNSIDE

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Company–Common	0.661***					
	(0.20)					
Company–Rule		0.500*				
		(0.28)				
Company–Procedural			0.014**			
			(0.01)			
Investor–Common				0.767***		
				(0.22)		
Investor–Rule					0.605**	
					(0.29)	
Investor–Procedural						0.018***
						(0.01)
IndependentVC	0.582**	0.636***	0.580**	0.572**	0.615**	0.514**
	(0.24)	*(0.24)*	*(0.23)*	*(0.24)*	*(0.24)*	*(0.23)*
VC–Age	0.002	0.003	0.003	0.003	0.003	0.003*
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
VC–Size	-0.000	-0.000	0.000	0.000	-0.000	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Syndicate–Follower	0.298	0.308	0.306	0.306	0.301	0.293
	(0.24)	*(0.25)*	*(0.24)*	*(0.24)*	*(0.24)*	*(0.24)*
Syndicate–Leader	0.117	0.122	0.155	0.090	0.100	0.105
	(0.21)	*(0.22)*	*(0.21)*	*(0.22)*	*(0.22)*	*(0.21)*
Company–Age	-0.001*	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Stage	0.081	0.110	0.086	0.062	0.101	0.075
	(0.09)	*(0.09)*	*(0.09)*	*(0.09)*	*(0.09)*	*(0.09)*
Year and Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	*926*	*926*	*920*	*926*	*926*	*919*
χ^2	*72.06*	*71.57*	*78.28*	*69.96*	*78.95*	*87.39*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.118*	*0.105*	*0.116*	*0.126*	*0.107*	*0.126*

Table 6: Main model: country fixed effects

This Table reports results from (ordered) Probit regressions for our main model described in Section 5.2. The dependent variables are INTERACTION in Panel A and DOWNSIDE in Panel B. For each Panel, columns *(i)* through *(vi)* report estimates for models whose main independent variable is a different measure of company, or investor, legal system. In columns *(i)* through *(iii)* *((iv)* through *(vi))* investor (company) country fixed effects are included, but not reported. All models include investor and deal controls. Investor controls are INDEPENDENTVC, VC–AGE, and VC–SIZE. Deal Controls are COMPANY–AGE, STAGE, SYNDICATE–FOLLOWER, and SYNDICATE–LEADER (reported), and DEAL–YEAR and INDUSTRY dummies (unreported). Variables are defined in Section 4. For each independent variable, we report the estimated coefficient and the t-ratio (in parenthesis), computed using heteroskedasticity-robust standard errors, clustered by venture firm. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

Panel A: INTERACTION

	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*
Company–Common	-0.237					
	(0.27)					
Company–Rule		-0.189				
		(0.38)				
Company–Procedural			-0.012			
			(0.01)			
Investor–Common				0.661*		
				(0.37)		
Investor–Rule					1.311***	
					(0.40)	
Investor–Procedural						0.046***
						(0.01)
IndependentVC	0.442*	0.429*	0.436*	0.525**	0.495**	0.407*
	(0.23)	*(0.23)*	*(0.23)*	*(0.23)*	*(0.22)*	*(0.23)*
VC–Age	-0.005***	-0.005***	-0.004***	-0.005***	-0.005***	-0.004***
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
VC–Size	-0.000	-0.000	-0.000	0.000	-0.000	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Syndicate–Follower	-0.072	-0.080	-0.099	-0.010	-0.020	-0.064
	(0.19)	*(0.18)*	*(0.18)*	*(0.18)*	*(0.18)*	*(0.19)*
Syndicate–Leader	0.302*	0.299*	0.285*	0.319**	0.292*	0.279*
	(0.16)	*(0.16)*	*(0.16)*	*(0.16)*	*(0.16)*	*(0.16)*
Company–Age	-0.000	-0.000	-0.001	-0.000	-0.000	-0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Stage	0.178**	0.177**	0.178**	0.192**	0.180**	0.162*
	(0.09)	*(0.09)*	*(0.09)*	*(0.09)*	*(0.09)*	*(0.09)*
Year and Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Investor country F.E.	Yes	Yes	Yes	No	No	No
Company country F.E.	No	No	No	Yes	Yes	Yes
Observations	*811*	*811*	*805*	*811*	*811*	*804*
χ^2	*596.76*	*613.99*	*444.80*	*201.35*	*242.04*	*236.50*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.220*	*0.219*	*0.220*	*0.191*	*0.198*	*0.215*

Panel B: DOWNSIDE

	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*
Company–Common	0.152					
	(0.25)					
Company–Rule		0.360				
		(0.30)				
Company–Procedural			0.003			
			(0.01)			
Investor–Common				0.749**		
				(0.33)		
Investor–Rule					1.029**	
					(0.44)	
Investor–Procedural						0.026**
						(0.01)
IndependentVC	0.637***	0.644***	0.644***	0.676***	0.671***	0.597***
	(0.24)	(0.24)	(0.24)	(0.22)	(0.23)	(0.23)
VC–Age	0.003*	0.003*	0.003*	0.002	0.002	0.003*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
VC–Size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Syndicate–Follower	0.282	0.294	0.287	0.304	0.295	0.277
	(0.21)	(0.21)	(0.21)	(0.21)	(0.21)	(0.20)
Syndicate–Leader	0.159	0.171	0.182	0.180	0.174	0.168
	(0.22)	(0.21)	(0.21)	(0.21)	(0.21)	(0.21)
Company–Age	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Stage	0.080	0.082	0.075	0.065	0.065	0.059
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Year and Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Investor country F.E.	Yes	Yes	Yes	No	No	No
Company country F.E.	No	No	No	Yes	Yes	Yes
Observations	*919*	*919*	*916*	*926*	*926*	*919*
χ^2	♢	♢	♢	*139.79*	*147.96*	*143.45*
Model-p-value	♢	♢	♢	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.208*	*0.208*	*0.213*	*0.197*	*0.197*	*0.200*

♢ In columns *(i)* to *(iii)* of Panel B, Stata cannot compute the Chi-square test because of collinearity. However, if we drop two of the investor-country fixed effects for smaller countries (such as Luxembourg and Portugal), this does not affect the significance of any coefficients, and the Chi-square test is computed (and is highly significant).

Table 7: Main model with partner US venture experience effects

This Table reports results from (ordered) Probit regressions for our model with partner US venture experience effects described in Section 5.4. The dependent variables are INTERACTION in Panel A and DOWNSIDE in Panel B. For each Panel, columns *(i)* through *(vi)* report estimates for models whose main independent variable is a different measure of company, or investor, legal systems. In columns *(iv)* through *(vi)* company country fixed effects are included, but not reported. All models include investor and deal controls. Investor controls are INDEPENDENTVC, VC–AGE, and VC–SIZE. Deal Controls are COMPANY–AGE, STAGE, SYNDICATE–FOLLOWER, and SYNDICATE–LEADER (reported), and DEAL–YEAR and INDUSTRY dummies (unreported). Variables are defined in Section 4. For each independent variable, we report the estimated coefficient and the t-ratio (in parenthesis), computed using heteroskedasticity-robust standard errors, clustered by venture firm. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

Panel A: INTERACTION

	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*
Investor–Common	0.569***			0.758*		
	(0.21)			*(0.39)*		
Investor–Rule		1.040***			1.326***	
		(0.27)			*(0.41)*	
Investor–Procedural			0.031***			0.053***
			(0.01)			*(0.01)*
Partner–US–Experience	1.126**	0.985*	1.365**	1.426***	1.347**	1.694***
	(0.52)	*(0.53)*	*(0.56)*	*(0.54)*	*(0.53)*	*(0.58)*
IndependentVC	0.509**	0.444**	0.356*	0.506**	0.481**	0.368*
	(0.22)	*(0.21)*	*(0.19)*	*(0.22)*	*(0.22)*	*(0.22)*
VC–Age	-0.006***	-0.005***	-0.005***	-0.005***	-0.005***	-0.004***
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
VC–Size	-0.000	-0.000**	-0.000	0.000	-0.000	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Syndicate–Follower	-0.062	-0.040	-0.078	-0.009	-0.017	-0.077
	(0.22)	*(0.21)*	*(0.21)*	*(0.19)*	*(0.18)*	*(0.19)*
Syndicate–Leader	0.174	0.190	0.191	0.326**	0.304*	0.279*
	(0.22)	*(0.21)*	*(0.19)*	*(0.16)*	*(0.16)*	*(0.16)*
Company–Age	0.000	0.000	0.000	-0.000	-0.000	-0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Stage	0.202*	0.214*	0.174*	0.200**	0.191**	0.164*
	(0.12)	*(0.11)*	*(0.10)*	*(0.09)*	*(0.09)*	*(0.08)*
Year and Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Company country F.E.	No	No	No	Yes	Yes	Yes
Observations	*792*	*792*	*785*	*792*	*792*	*785*
χ^2	*123.19*	*164.66*	*220.00*	*252.73*	*283.06*	*339.97*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.145*	*0.166*	*0.198*	*0.211*	*0.217*	*0.242*

Panel B: DOWNSIDE

	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*
Investor–Common	0.816***			0.810**		
	(0.22)			*(0.33)*		
Investor–Rule		0.583**			1.035**	
		(0.29)			*(0.46)*	
Investor–Procedural			0.019***			0.030***
			(0.01)			*(0.01)*
Partner–US–Experience	0.929	0.767	0.968*	1.120**	1.086**	1.274**
	(0.61)	*(0.53)*	*(0.52)*	*(0.54)*	*(0.50)*	*(0.51)*
IndependentVC	0.552**	0.614**	0.493**	0.635***	0.635***	0.537**
	(0.24)	*(0.24)*	*(0.23)*	*(0.22)*	*(0.22)*	*(0.22)*
VC–Age	0.003	0.003	0.004**	0.002	0.002	0.003*
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
VC–Size	0.000	-0.000	0.000	0.000	0.000	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Syndicate–Follower	0.346	0.334	0.330	0.362*	0.354*	0.329*
	(0.24)	*(0.25)*	*(0.24)*	*(0.20)*	*(0.20)*	*(0.20)*
Syndicate–Leader	0.114	0.121	0.129	0.232	0.226	0.214
	(0.22)	*(0.22)*	*(0.22)*	*(0.21)*	*(0.20)*	*(0.21)*
Company–Age	-0.001*	-0.001**	-0.001**	-0.001	-0.001	-0.001*
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Stage	0.051	0.099	0.066	0.042	0.047	0.031
	(0.09)	*(0.10)*	*(0.09)*	*(0.08)*	*(0.08)*	*(0.08)*
Year and Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Company country F.E.	No	No	No	Yes	Yes	Yes
Observations	*906*	*906*	*899*	*906*	*906*	*899*
χ^2	*71.54*	*82.10*	*91.67*	*156.01*	*166.58*	*166.19*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.136*	*0.112*	*0.136*	*0.217*	*0.216*	*0.223*

Table 8: Main model: within-civil-law countries analysis

This Table reports results from (ordered) Probit regressions for our main model estimated with observations from civil law countries only, described in Section 5.5. The dependent variables are INTERACTION in Panel A and DOWNSIDE in Panel B. For each dependent variable, columns *(i)-(ii)* report estimates for models whose main independent variable is INVESTOR–RULE and INVESTOR–PROCEDURAL. Columns *(iii)-(iv)* report estimates for models which also include company country fixed effects. All models include investor and deal controls. Investor controls are INDEPENDENTVC, VC–AGE, and VC–SIZE. Deal Controls are COMPANY–AGE, STAGE, SYNDICATE–FOLLOWER, and SYNDICATE–LEADER (reported), and DEAL–YEAR and INDUSTRY dummies (unreported). Variables are defined in Section 4. For each independent variable, we report the estimated coefficient and the t-ratio (in parenthesis), computed using heteroskedasticity-robust standard errors, clustered by venture firm. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

Panel A: INTERACTION

	(i)	*(ii)*	*(iii)*	*(iv)*
Investor–Rule	1.074***		1.340***	
	(0.28)		(0.41)	
Investor–Procedural		0.034***		0.061***
		(0.01)		(0.01)
IndependentVC	0.405*	0.401*	0.492*	0.414
	(0.23)	(0.22)	(0.26)	(0.26)
VC–Age	-0.005***	-0.004***	-0.004***	-0.004***
	(0.00)	(0.00)	(0.00)	(0.00)
VC–Size	-0.000**	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Syndicate–Follower	0.041	-0.023	0.070	-0.002
	(0.23)	(0.23)	(0.21)	(0.22)
Syndicate–Leader	0.100	0.085	0.180	0.179
	(0.22)	(0.21)	(0.18)	(0.17)
Company–Age	0.000	-0.000	-0.000	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)
Stage	0.162	0.157	0.151	0.164*
	(0.12)	(0.11)	(0.10)	(0.10)
Year and Industry F.E.	Yes	Yes	Yes	Yes
Company country F.E.	No	No	Yes	Yes
Observations	*636*	*629*	*636*	*629*
χ^2	*127.63*	*203.17*	*251.52*	*255.23*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.150*	*0.174*	*0.198*	*0.214*

Panel B: DOWNSIDE

	(i)	*(ii)*	*(iii)*	*(iv)*
Investor–Rule	0.349		0.678	
	(0.30)		(0.51)	
Investor–Procedural		0.010		0.014
		(0.01)		(0.01)
IndependentVC	0.608**	0.565**	0.782***	0.732***
	(0.27)	(0.26)	(0.25)	(0.25)
VC–Age	0.003*	0.004**	0.003*	0.003**
	(0.00)	(0.00)	(0.00)	(0.00)
VC–Size	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Syndicate–Follower	0.413	0.402	0.407*	0.392*
	(0.27)	(0.27)	(0.23)	(0.22)
Syndicate–Leader	0.212	0.214	0.324	0.334
	(0.24)	(0.24)	(0.23)	(0.23)
Company–Age	-0.001*	-0.001*	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)
Stage	0.088	0.081	0.098	0.104
	(0.11)	(0.11)	(0.09)	(0.09)
Year and Industry F.E.	Yes	Yes	Yes	Yes
Company country F.E.	No	No	Yes	Yes
Observations	*747*	*740*	*747*	*740*
χ^2	*59.94*	*59.81*	*80.97*	*78.69*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.105*	*0.110*	*0.197*	*0.195*

Table 9: Main model with different securities

This Table reports results from (ordered) probit regressions for our model with different securities described in Section 5.6. The dependent variables are CONVERTIBLE PREFERRED in Panel A, DEBT in Panel B, and EQUITY in Panel C. For each dependent variable, columns *(i)* through *(iii)* report estimates for models whose main independent variable is INVESTOR–COMMON, INVESTOR–RULE, and INVESTOR–PROCEDURAL. Columns *(iv)* through *(vi)* report estimates for models which also include company country fixed effects. All models include investor and deal controls. Investor controls are INDEPENDENTVC, VC–AGE, and VC–SIZE. Deal Controls are COMPANY–AGE, STAGE, SYNDICATE–FOLLOWER, and SYNDICATE–LEADER (reported), and DEAL–YEAR and INDUSTRY dummies (unreported). Variables are defined in Section 4. For each independent variable, we report the estimated coefficient and the t-ratio (in parenthesis), computed using heteroskedasticity-robust standard errors, clustered by venture firm. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

Panel A: CONVERTIBLE PREFERRED

	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*
Investor–Common	0.489**			0.578*		
	(0.22)			*(0.33)*		
Investor–Rule		0.530*			0.995**	
		(0.31)			*(0.50)*	
Investor–Procedural			0.014*			0.020*
			(0.01)			*(0.01)*
IndependentVC	0.476*	0.488**	0.416*	0.623***	0.615**	0.554**
	(0.25)	*(0.25)*	*(0.25)*	*(0.24)*	*(0.24)*	*(0.25)*
VC–Age	0.003*	0.003*	0.004**	0.003*	0.003*	0.003*
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
VC–Size	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Syndicate–Follower	0.415*	0.419*	0.414*	0.419**	0.411**	0.398*
	(0.24)	*(0.24)*	*(0.23)*	*(0.20)*	*(0.20)*	*(0.20)*
Syndicate–Leader	0.280	0.285	0.296	0.367*	0.355*	0.360*
	(0.22)	*(0.22)*	*(0.22)*	*(0.22)*	*(0.22)*	*(0.22)*
Company–Age	-0.001**	-0.001**	-0.001***	-0.001**	-0.001**	-0.001**
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Stage	0.083	0.106	0.089	0.096	0.091	0.093
	(0.10)	*(0.10)*	*(0.10)*	*(0.09)*	*(0.09)*	*(0.09)*
Year and Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Company country F.E.	No	No	No	Yes	Yes	Yes
Observations	*926*	*926*	*919*	*922*	*922*	*915*
χ^2	*75.08*	*74.00*	*75.34*	*147.68*	*130.53*	*133.32*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.109*	*0.106*	*0.115*	*0.193*	*0.196*	*0.195*

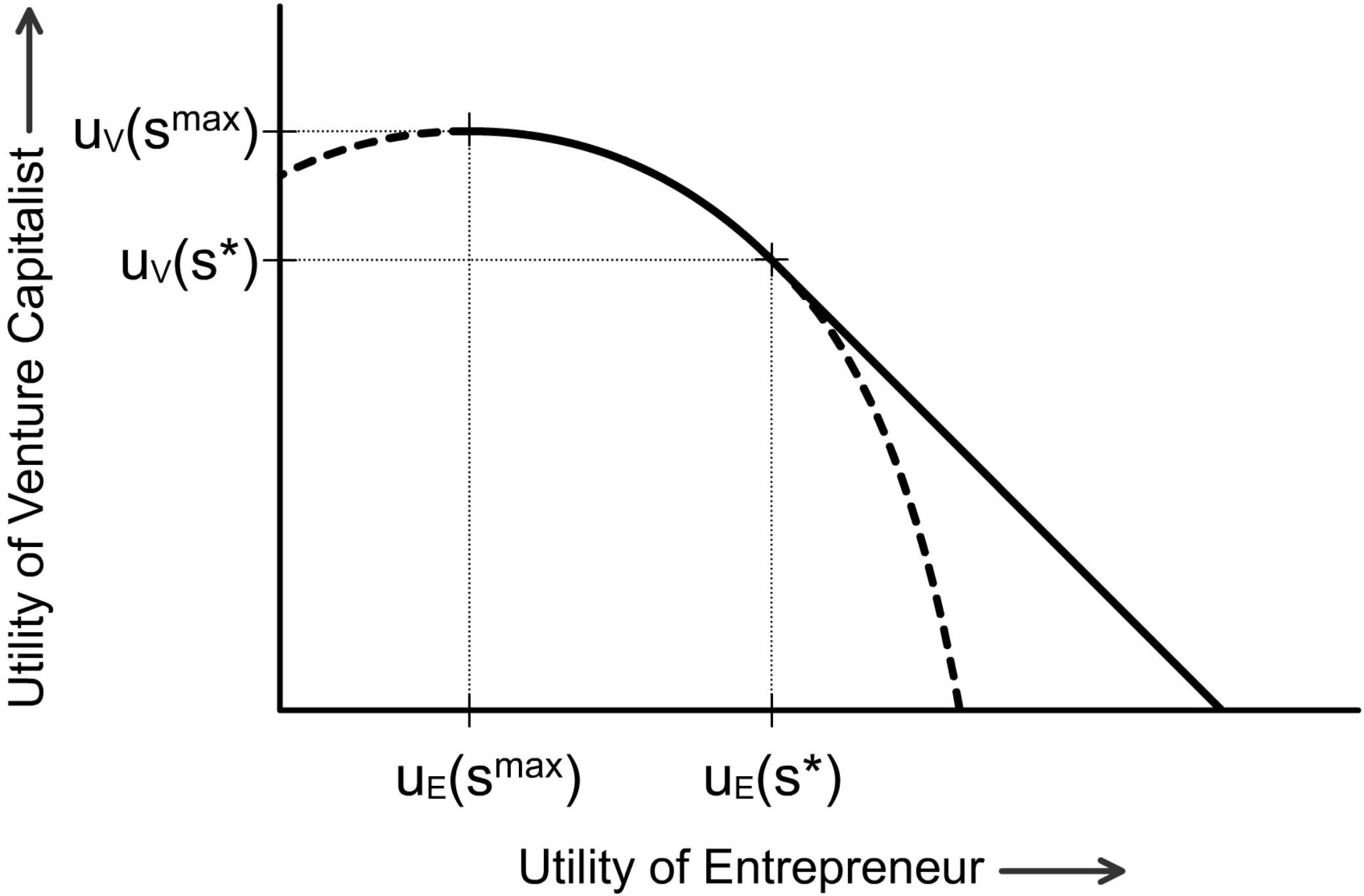
Panel B: DEBT

	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*
Investor–Common	0.687***			0.645*		
	(0.24)			*(0.34)*		
Investor–Rule		0.402			0.040	
		(0.33)			*(0.69)*	
Investor–Procedural			0.020***			0.024**
			(0.01)			*(0.01)*
IndependentVC	0.412*	0.475**	0.338*	0.259	0.282	0.241
	(0.21)	*(0.23)*	*(0.20)*	*(0.22)*	*(0.23)*	*(0.23)*
VC–Age	-0.001	-0.001	-0.001	-0.001	-0.002	-0.001
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
VC–Size	0.000*	0.000	0.000	0.000*	0.000*	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Syndicate–Follower	-0.118	-0.106	-0.121	-0.127	-0.118	-0.141
	(0.22)	*(0.23)*	*(0.22)*	*(0.22)*	*(0.22)*	*(0.22)*
Syndicate–Leader	-0.341	-0.331	-0.325	-0.313	-0.285	-0.333
	(0.22)	*(0.22)*	*(0.23)*	*(0.22)*	*(0.22)*	*(0.23)*
Company–Age	0.000	-0.000	0.000	0.000	0.000	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Stage	-0.036	0.017	-0.024	-0.066	-0.047	-0.077
	(0.12)	*(0.12)*	*(0.12)*	*(0.12)*	*(0.12)*	*(0.12)*
Year and Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Company country F.E.	No	No	No	Yes	Yes	Yes
Observations	*926*	*926*	*919*	*886*	*886*	*879*
χ^2	*66.12*	*49.94*	*60.11*	*225.15*	*193.12*	*233.24*
Model-p-value	*0.000*	*0.001*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.109*	*0.078*	*0.111*	*0.135*	*0.127*	*0.143*

Panel C: EQUITY

	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*
Investor–Common	-0.808***			-0.621		
	(0.27)			*(0.38)*		
Investor–Rule		-0.431			-1.812***	
		(0.38)			*(0.65)*	
Investor–Procedural			-0.015*			-0.030**
			(0.01)			*(0.01)*
IndependentVC	0.084	-0.035	0.085	-0.028	0.018	0.110
	(0.27)	*(0.27)*	*(0.26)*	*(0.26)*	*(0.26)*	*(0.26)*
VC–Age	-0.002	-0.002	-0.003	-0.001	-0.001	-0.002
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
VC–Size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Syndicate–Follower	-0.687***	-0.671***	-0.685***	-0.738***	-0.740***	-0.722***
	(0.23)	*(0.24)*	*(0.23)*	*(0.22)*	*(0.22)*	*(0.23)*
Syndicate–Leader	-0.343*	-0.341*	-0.363*	-0.507***	-0.476**	-0.516***
	(0.18)	*(0.19)*	*(0.19)*	*(0.19)*	*(0.19)*	*(0.19)*
Company–Age	0.000	0.001	0.001	0.001	0.001	0.001
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Stage	-0.006	-0.055	-0.038	-0.037	-0.014	-0.024
	(0.10)	*(0.10)*	*(0.10)*	*(0.09)*	*(0.09)*	*(0.09)*
Year and Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Company country F.E.	No	No	No	Yes	Yes	Yes
Observations	*922*	*922*	*915*	*833*	*833*	*823*
χ^2	*64.07*	*62.56*	*64.24*	*119.80*	*139.13*	*128.80*
Model-p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.136*	*0.105*	*0.122*	*0.190*	*0.209*	*0.204*

Figure 1


Utility of Venture Capitalist
$u_V(s^{max})$
$u_V(s^*)$
$u_E(s^{max})$
$u_E(s^*)$
Utility of Entrepreneur