What Role of Legal Systems in Financial Intermediation? Theory and Evidence

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Abstract

How does the relationship between an investor and entrepreneur depend on the legal system? In a double moral hazard framework, we show how optimal contracts, corporate governance, and investor actions depend on the legal system. With better legal protection, investors give more non-contractible support, demand more downside protection, and exercise more governance. Investors in better legal systems develop stronger governance and support competencies. Therefore, when investing in a different legal systems they behave differently than local investors. We test these predictions using a hand-collected dataset of European venture capital deals. The empirical results confirm the predictions of the model.

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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. A large theoretical literature has pointed to the importance of both contractual and non-contractual aspects of financial intermediation when an entrepreneur seeks funds for an investment project (Holmström and Tirole (1997), Hart (2001)). We look at how this relationship 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. Our theory makes three predictions. The better the legal system: (i) the more investors provide value-adding support, (ii) the more they demand contractual downside protection in bad states of the world, using securities such as debt, convertible debt, or preferred equity, and (iii) the more they exercise corporate governance. The underlying intuition is that investing in governance and support are only worthwhile if the legal system provides investors with sufficient guarantees that these efforts will not be wasted. We show that in a better legal system it is optimal to give the entrepreneur stronger upside incentives. As a consequence it becomes necessary to give investors additional cash flow rights on the downside, in order to satisfy their participation constraint.

Our theory also considers how the legal systems might affect financial intermediaries themselves. We consider the influence of the legal system on intermediaries' incentives to develop the competencies necessary to provide value added services and to exert governance. We show that intermediaries from countries with a better legal tradition will provide more governance and 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 investors and their companies. Venture capital firms can play a value-adding role in the companies they finance, both through contracting and by providing non-contractible inputs such as advice, support, and governance (Bottazzi, Da Rin and Hellmann (2004), Gompers (1995), Hellmann and Puri (2000, 2002), Hochberg (2003), Kaplan and Strömberg (2003), Lerner (1994), Lindsey (2003), Sahlman (1990), Sorensen (2004)). While this evidence concerns the US, over the last decade venture capital has become a global phenomenon (Megginson (2004)), with Europe becoming a particularly important market (Bottazzi and Da Rin (2004), Da Rin, Nicodano, and Sembenelli (2004)). As the venture capital industry develops, there is considerable debate about whether differences in investment methods are related to differences in legal systems. Europe is therefore an excellent place to examine the effects of differences across legal systems, since European countries are fairly comparable in their stages of economic growth, yet there is a rich variety of legal systems within Europe.

Our sample consists of 1,430 venture deals from 124 venture capital firms in 17 Euro-

pean countries. Our primary data source is a comprehensive survey of all venture capital firms in these countries. We then augmented the data with numerous secondary sources, including commercial databases and websites. This constituted a significant data collection effort, which required considerable time and effort, but it 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 datasets. It contains several measures of the interactions between venture capitalists and entrepreneurs, which allows us to assess not only the contractual, but also the non-contractual aspects of their relationship. These measures cannot be obtained from standard sources of venture capital data (such as VenturExpert), nor from venture capital contracts. Another notable feature of the dataset is that it provides us with investments which cross over to different legal systems.

We find strong empirical support for our theoretical predictions. Better legal systems tend to be associated with more investor involvement, more downside protection for the investors, and more governance. 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 alternative index measures of the quality of the legal system: the rule of law and the degree of legal procedural complexity.

Our data also allows us to examine whether the effects of legal systems are mainly due to company or investor characteristics. Using the information from investments that cross legal system boundaries, we find that investor effects also matter considerably. Consistent with our model, investors from countries with stronger legal traditions provide more support, demand more downside protection, and exercise more governance, both within and outside their legal system. The reverse is also true, i.e., investors from weaker legal system do less of these things, both within and outside their legal system. This supports our theoretical prediction that the legal system affects financial outcomes not only directly, but also indirectly by affecting the extent to which financial intermediaries develop competencies.

Much of the literature uses differences between common and civil law countries to identify the effect of the legal system. Our data allows us to go one step further, and perform some additional, more detailed, tests by focusing on differences within civil law countries. We find that our results continue to hold in the subsample of civil law companies and investors, thus providing a stronger case for the importance of legal systems.

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 for the interdependence between contractual and non-contractual aspects. Moreover, the analysis shows how the legal system affects investor competencies themselves. The findings have important 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, as well as in the conclusion.

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, and Section 6 provides some further discussion. It is

followed by the conclusion.

2 Related Literature

A number of recent papers address issues related to this paper. On the theory side, 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 (2004) consider the effect of shareholder protection on managerial incentives, monitoring and ownership concentration. Bergman and Nicolaievski (2004) develop a model where the quality of the judicial systems drives the quality of enforcement. We are not aware of any theory paper that specifically addresses the role of the legal system for both the contractual and non-contractual aspects of financial intermediation.

Turning to the empirical literature, papers based on company-level data have started looking at the effects of legal systems on financial or economic outcomes. Demirgüç-Kunt and Maksimovic (1998), for example, provide evidence on the link between legal origin, financial institutions and company growth. Qian and Strahan (2005) 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.

Three recent papers which use venture capital data are of particular relevance. Lerner and Schoar (2004) (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 on venture capital deals but on private equity deals more broadly defined. Their data are mainly from developing, rather than developed countries. They find statistically significant relationships between legal origin and the type of securities and contractual covenants used. These effects continue to persist after controlling for investor characteristics.

Kaplan, Martel, and Strömberg (2003) (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), finding important differences. Their results show a relationship between legal systems and the choice of securities and other contractual features. However, the coefficients of legal systems become insignificant after controlling for the investor's degree of sophistication, measured by its being US-based or familiar with the US market.

Cumming, Schmidt and Walz (2004) (CSW henceforth) analyze a sample of 3,848 private equity investments in 39 developed and developing countries between 1971 and 2003. They focus on the exercise of corporate governance by venture capitalists. They find a positive correlation between the quality of the legal system and the exercise of governance, in particular the board representation of the investor.[1]

[1] Similarly, Bascha and Walz (2001) examine German data, and Cumming and MacIntosh (2003) ex-

Our study advances the literature on several counts. We address this line of research from a new angle, by first developing a theoretical model that guides our empirical analysis. This gives us a coherent framework for explaining how the legal system affects the *entire* financing relationship, both contractual and non-contractual, between investors and entrepreneurs. Moreover, we consider both the direct effect of the law, as well as indirect effects through the competencies of intermediaries.

We also use a new data approach. KMS and LS gather venture capital contracts. This has the advantage of providing very detailed data on the contractual relationship between the venture capitalist and the entrepreneur. CSW obtain their data from a large fund of funds. We choose a complementary approach of gathering survey data on venture capital activity. This has the advantage that we can obtain data on both contractual and non-contractual aspects of the investment relationship. We are also able to build a substantially larger sample than LS and KMS. Our dataset also gives us a new vantage point for looking at the role of legal systems. First, we consider not only investments of Anglo-Saxon investors in civil law countries, but also the reverse—investments by civil law venture capitalists in common law countries. Second, we are able to repeat our analysis within the subsample of civil law countries, thus eliminating concerns that differences in legal systems are mainly driven by the UK or the US.

Despite the different approaches, there is a remarkable consistency across these papers. We confirm (and provide a theoretical explanation for) the findings that investors from countries with strong legal traditions make more extensive use of securities that afford downside protection. Our results also confirm the findings that investors retain aspects of their investment styles when investing abroad. KMS focus mainly on the investments of US (or US-tied) investors abroad. LS focus on investment of Anglo-Saxon private equity groups in developing countries. Our empirical analysis finds strong evidence for such investor 'home' effect, which we show matter not only to investments from stronger to weaker legal systems, but also to investments from weaker to stronger legal systems.

3 Theory

3.1 Assumptions

The double moral hazard model, where both the entrepreneur and the venture capitalist make non-contractible contributions that affect the likelihood of the venture's success, has become the workhorse of the theoretical venture capital literature (Casamatta (2003), Cestone (2002), Hellmann (1998, 2004), Inderst and Müller (2003), Repullo and Suarez (2004), Schindele (2004), Schmidt (2003)). In this paper, we incorporate the quality of the legal system into such a double moral hazard model.

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. We assume

amine US and Canadian data.

that assets cannot be stolen. With probability p, the company is a success, generating additional cash flows π. The problem with these cash flows is that their verifiability depends on the legal system. We assume that investors' claims on π are legally enforceable with probability λ. Thus, λ will be our measures of the quality of legal system. With probability $1-\lambda$ the entrepreneur identifies a weakness in the legal system that allows her to divert the cash flows π to her pockets. 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.

For the double moral hazard problem, we use a tractable specification, where the probability of generating additional cash flows is given by $p = p_G + p_E e + p_V v$. Let e measure the non-contractible effort of the entrepreneur, and v measure the amount of non-contractible value-adding support of the venture capitalist. For simplicity we use 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. We discuss p_G below. Throughout we assume that p_G, p_E and p_V are sufficiently low to ensure that $p < 1$.

An important decision is what role the venture capitalist takes with respect to corporate governance (Dessein (2003), Hellmann (1998)). The corporate finance literature typically argues that governance provides a safeguard for shareholder interests. Typically this increases a company's expected profits, but decreases the entrepreneur's private benefits (Burkart, Gromb and Panunzi (1997)). We capture this trade-off in the following simple manner. If the venture capitalist does not exercise governance (denote this by $G = 0$), the base probability of success is $p_G = p_0$, and the entrepreneur enjoys private benefit $\gamma_G = \gamma_0$. With governance ($G = 1$), p_G rises to $p_G = p_1 > p_0$, but the entrepreneur has lower private benefits $\gamma_G = \gamma_1 < \gamma_0$.

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. we can focus on debt and equity.[2] 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. For expositional convenience, we focus on the case where $0 \leq d \leq a$, but we return to this assumption in section 3.4.

For $\phi > s$ the entrepreneur would never want to steal, since the cost of diverting funds is greater than the cost of sharing. We focus on the non-trivial case where $\phi < s$, so that the entrepreneur always prefers stealing over sharing. Define:

$$\Lambda = \lambda + (1-\lambda)(1-\phi)$$

so that Λ represents the fraction of total returns that are not lost due to appropriation by the entrepreneur. Let u_E, u_V denote the utilities of the entrepreneur and venture

[2] Some venture capitalists (especially in the US) use convertible preferred equity. In this simple linear model, this is equivalent to a mix debt and equity. We can map one into the other 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 $\widetilde{s}(a+\pi) = d + s(\pi + a - d) \Leftrightarrow \widetilde{s} = s + \dfrac{(1-s)d}{a+\pi}$.

capitalist, and u the joint utility, then:

$$\begin{aligned} u_E &= \gamma_G + (1-s)(a-d) + p\pi(\Lambda - \lambda s) - c_E - k_E \\ u_V &= d + s(a-d) + p\pi\lambda s - c_V - k_V \\ u &= \gamma_G + a + p\pi\Lambda - c_E - c_V - k_E - k_V \end{aligned}$$

The parameters p_V and p_1 measure 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 and p_1 being set at some prior date, before the venture firm engages in deals. A venture firm's competencies may thus depend on the kind of investments it plans to do, and on the legal environment it operates in. In section 3.2 we derive the optimal contract for a given level of competencies. In section 3.3 we examine how the legal system influences competencies, and how this, in turn, affects optimal contracts.

3.2 Optimal contracts

Suppose 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 $u_E = 0$, and subject to two incentive constraints. From the first-order conditions of maximizing u_V w.r.t. v, and u_E w.r.t. e, we obtain:

$$e = p_E\pi(\Lambda - \lambda s) \text{ and } v = p_V\pi\lambda s \tag{1}$$

Naturally, increasing s increases v and decreases e, so that equity affects incentives. 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 (2004) shows that even in a much more general setting, downside protection plays a similar role.

Using standard reasoning, the optimal value of s, denoted by s^*, maximizes the joint utility u. The first-order condition for s^* is given by:

$$\pi\Lambda(p_E\frac{de}{ds} + p_V\frac{dv}{ds}) - e\frac{de}{ds} - v\frac{dv}{ds} = 0$$

Using (1), we can solve for s^*. After some transformations we obtain:

$$s^* = \frac{\Lambda}{\lambda}\frac{p_V^2}{p_E^2 + p_V^2} \tag{2}$$

Clearly, s^* is larger the larger the venture capitalist's value contribution (p_V), and the smaller the entrepreneur's value contribution (p_E). The following lemma considers the effect of λ on s^*.

Lemma 1 *The venture capitalist's optimal share s^* is decreasing in λ.*

The intuition for Lemma 1 is that a better legal environment redistributes rents from the entrepreneur to the venture capitalist. In a double moral hazard setting, this upsets the balance of incentives. The optimal contract addresses this by allocating a lower share of equity to the venture capitalist. It is interesting to note that Lemma 1 is empirically supported by LS, who find that venture capitalists hold larger stakes in countries with weaker legal protection.

Using (2), the equilibrium effort levels are given by:

$$e^* = \frac{p_E^3}{p_E^2 + p_V^2}\Lambda\pi \text{ and } v^* = \frac{p_V^3}{p_E^2 + p_V^2}\Lambda\pi \tag{3}$$

With this we examine the provision of value-adding support.

Proposition 1 ***(Support)*** *The optimal level of value-added support v^* is increasing with the quality of the legal system λ: $\frac{dv^*}{d\lambda} = \frac{p_V^3\phi\pi}{p_E^2 + p_V^2} > 0$.*

Proposition 1 yields a first testable implication, that there is a positive relationship between the quality of the legal system, and the support provided by venture capitalists.

One might wonder whether the greater effort by the venture capitalist comes at the expense of a lower effort by the entrepreneur. This is not the case, since in fact $\frac{de^*}{d\lambda} = \frac{p_E^3\phi\pi}{p_E^2 + p_V^2} > 0$. Because there is less diversion of cash flow, less value is wasted, and therefore it is possible to write an optimal contract that generates more effort by both the venture capitalist and the entrepreneur.

Next, we assess how the equilibrium level of debt d^* depends on λ.

Proposition 2 ***(Downside)*** *The optimal level of debt d^* is increasing with the quality of the legal system λ.*

The proof is in the Appendix. Proposition 2 yields a second testable implication, that in a better legal system the optimal contract places more emphasis on giving the venture capitalist additional downside protection. A priori, it is not immediately clear how the quality of the legal system might affect downside protection. The intuition for proposition 2 is as follows. In a better legal system, it is harder for the entrepreneur to divert funds. Since appropriating cash flows provided incentives to the entrepreneur, it now becomes necessary to give the entrepreneur more incentives in terms of a greater equity stake. This leaves less equity for the venture capitalist, as shown in Lemma 1. The venture capitalist therefore needs to extract any additional value through stronger downside protection. Hence d^* is an increasing function of λ.

Consider finally the question of optimal governance. To determine the optimal value of G, we rewrite the joint utility as follows:

$$u_G = \gamma_G + a + p_G\pi\Lambda + (p_E e^* + p_V v^*)\pi\Lambda - c_E - c_V - k_E - k_V$$

The net benefit of (venture capital) governance is given by:

$$u_1 - u_0 = (p_1 - p_0)\pi\Lambda - \Gamma \text{ where } \Gamma = \gamma_0 - \gamma_1$$

Γ denotes the loss of private benefits from the exercise of governance. Naturally, this may differ for different entrepreneurs. Let $\widehat{\Gamma} = (p_1 - p_0)\pi\Lambda$ be defined by $u_1 = u_0$. Governance is efficient whenever $\Gamma < \widehat{\Gamma}$.

Proposition 3 ***(Governance)*** *The better the legal system, the more often governance is efficient. Formally,* $\dfrac{d\widehat{\Gamma}}{d\lambda} = (p_1 - p_0)\pi\phi > 0$.

Proposition 3 yields our third testable implication, that the range of parameters for which governance is efficient, is increasing with the quality of the legal system. The intuition is that venture capitalists find it easier to reap the benefits of exercising governance within a better legal system.

3.3 Optimal competencies

So far, we have taken the competencies of the venture capitalist as given—in line with the extant literature. However, the legal system can also affect the venture capitalist's competencies. We can ask whether venture capitalists that operate predominantly in a better legal environment also have stronger incentives to develop value-adding competencies. This will provide a theoretical basis for empirically examining investor "home effects."

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 Γ, p_0, p_E, k_E, k_V, π and a. Moreover, venture capital firms can invest both domestically and abroad. $\Omega(\lambda, x)$ therefore describes the distribution of entrepreneurs not only in terms of different x's, but also in terms of different λ's. We capture the notion of an investor's home effect as follows. We assume that an investor that is located in a better legal system sees a deal flow with a better distribution of λ's. That is, we equate a better domestic legal system with a first-order stochastic dominant shift of the distribution of λ, holding x constant.

In our model, the value-adding competencies of the venture capitalist are represented by the effort parameter p_V and the governance parameter p_1 (or equivalently $p_1 - p_0$). We assume that the cost of developing competencies is given by standard convex cost functions that we denote respectively by $C_V(p_V)$ and $C_1(p_1)$. Each venture capitalist then maximizes $U_V = \int u_V(\lambda, x)d\Omega(\lambda, x) - C_V(p_V) - C_1(p_1)$ w.r.t. p_V and p_1.

Proposition 4 ***(Investor home effect)***

(i) The better the legal system, the more a venture capitalist develops competencies. Formally, p_V and p_1 are both increasing for any first order stochastic dominant shift of λ.

(ii) For a given λ, the equilibrium depends on the competencies of the venture capitalists in the following way:

$$\frac{dv^*}{dp_V} > 0, \quad \frac{dd^*}{dp_V} \gtreqless 0, \quad \frac{d\widehat{\Gamma}}{dp_V} = 0$$

$$\frac{dv^*}{dp_1} = 0, \quad \frac{dd^*}{dp_1} > 0, \quad \frac{d\widehat{\Gamma}}{dp_1} > 0$$

The proof is in the Appendix. Proposition 4 consists of two distinctive 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 increasing in λ. Part (ii) shows that, within a given legal system, venture capitalists with higher competencies provide more support and more governance. They might also ask for more downside protection—this effect is unambiguous for p_1 but ambiguous for p_V.

Proposition 4 implies that in a given country there are systematic differences between domestic and foreign investors. If the foreign investors come from a better legal system, they are likely to provide more support and governance, and possibly ask for more downside protection. If the foreign investors come from a worse legal system, the opposite will apply.

3.4 Further discussion

In our model investor involvement is a complement to legal protection. The key intuition is that a better legal system better protects value creation, which makes investor involvement more worthwhile. One could imagine a different model, where investor involvement is a substitute to legal protection. However, such a model would require a strong assumption. To show what it takes to make investor involvement and legal protection a substitute, let us focus on the exercise of governance. In our main model, the benefit of governance is better performance, as measured by $p_1 > p_0$. This benefit requires good legal protection, leading to Proposition 3. However, in addition to improving performance, governance may also reduce the likelihood of stealing. That is, an additional reason for exercising governance might be to better protect a company's cash flows. This would seem to suggest a substitute relationship between the quality of the legal system and the exercise of governance, namely that the prevention of stealing is likely to be more important in a weak legal system.

We now show that a formalization of this intuitive argument creates some unexpected results. Suppose that the exercise of governance reduces the probability of diverting funds by θ, so that the probability that cash flows are not stolen is λ without governance and $\lambda+\theta$ with governance. The net benefit of control is now given by $u_1 - u_0 = (p_1 - p_0)\pi\Lambda - \Gamma + Z$

where $Z = z(\lambda+\theta) - z(\lambda)$ and $z(\lambda) = (p_E e^* + p_V v^*)\pi\Lambda - c_E(e^*) - c_V(v^*)$. Z measures the benefit of governance, in terms of reducing the probability of stealing. The effect of the legal system on optimal governance is now given by $\frac{d\widehat{\Gamma}}{d\lambda} = (p_1 - p_0)\pi\phi + \frac{dZ}{d\lambda}$. Using (3), and after some transformations, we get $z(\lambda) = \Lambda^2\pi^2\tau$ where $\tau = (\frac{p_E^4}{p_E^2+p_V^2} + \frac{p_V^4}{p_E^2+p_V^2}) - \frac{1}{2}(\frac{p_E^3}{p_E^2+p_V^2})^2 - \frac{1}{2}(\frac{p_V^3}{p_E^2+p_V^2})^2$. Note that $z(\lambda)$ is a convex function of λ (through Λ). This means that the marginal benefit of reducing the appropriation of funds by the entrepreneur is increasing in λ. Formally, we have $\frac{dz(\lambda)}{d\lambda} = 2\Lambda\pi^2\tau\phi > 0$ and $\frac{dZ}{d\lambda} = 2\pi^2\tau\phi^2\theta > 0$. The benefit of governance in terms of reducing the divertion of funds is then increasing with the quality of the legal system, not decreasing, which reinforces Proposition 3.[3]

So far we assumed that the optimal d^* falls in the range $[0, a]$. It is always possible to find appropriate values of k_E, such that this is true. Formally, let $\underline{k_E}$ be such that $u_E(s^*) = 0$ for $d = a$, and $\overline{k_E}$ such that $u_E(s^*) = 0$ for $d = 0$, then $d^* \in [0, a]$ whenever $k_E \in [\underline{k_E}, \overline{k_E}]$. For $k_E > \overline{k_E}$, the entrepreneur's participation constraint is not satisfied even at $d^* = 0$. The venture capitalist then makes a transfer payment, which we can think of as a higher base wage for the entrepreneur. For $k_E < \underline{k_E}$, the entrepreneur would have to make a transfer payment. But if the entrepreneur faces a binding wealth constraint, the venture capitalist can only set $d^* = a$, and then increase his equity stake above the optimal level s^*. In the Appendix we show that Propositions 1 and 3 continue to hold even under those circumstances.

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 (2004) shows how the intuitions from a model with two states carry over to a much more general specification of returns.

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, after the proof of Proposition 2, we consider the generalized Nash bargaining solution, where the venture capitalist's bargaining power μ can take any value between zero and one. For sufficiently low equilibrium values of d^*, the positive relationship between optimal debt (d^*) and the quality of the legal system (λ) continues to apply for all values of μ. For higher equilibrium values of d^*, we show that there exists $\widehat{\mu}$ (with $0 < \widehat{\mu} < 1$), so that there is a negative relationship for $\mu < \widehat{\mu}$ and a positive relationship for $\mu > \widehat{\mu}$. Thus, while our theory suggests a positive relationship between the legal system and the level of

[3] Making investor involvement a substitute to legal protection is still possible. but it requires an additional strong assumption. In particular, we need to assume that θ itself is a rapidly decreasing function of λ, i.e., $d\theta/d\lambda$ must be sufficiently negative. In other words, we need to assume that if governance reduces the probability of stealing, this effect is much stronger in a weak legal system. Using standard calculations, we obtain: $dZ/d\lambda = 2\pi^2\tau\phi^2\theta + 2(\Lambda + \theta\phi)\pi^2\tau\phi(d\theta/d\lambda)$. The first term is the same as before, while the second term captures the negative relationship between preventing stealing, and the quality of the legal system. To get $d\widehat{\gamma}/d\lambda < 0$, this second effect has to be sufficiently strong, namely $\frac{d\theta}{d\lambda} < -\frac{(p_1 - p_0)\pi\phi + 2\pi^2\tau\phi^2\theta}{2(\Lambda + \theta\phi)\pi^2\tau\phi}$. Whether such condition holds or not is ultimately an empirical issue.

debt for a large range of parameter values, we cannot rule out a negative relationship for some parameter values.

Finally, for simplicity we have assumed that ϕ is a constant. As λ increases, it is possible that the cost of stealing also increases, i.e., $d\phi/d\lambda \geq 0$. It is straightforward to show that our results continue to hold as long as Λ is increasing in λ. This condition merely requires that a better legal system has fewer inefficiency losses.

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), Da Rin, Nicodano, and Sembenelli (2004)). And Europe has a remarkable variety of legal systems, so that we have several countries for both common and civil law countries, and countries with diverse levels of the legal indices.

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).[4] 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.[5] The survey asked respondents a substantial amount of detailed company-level information.

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

[5] 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.

We also asked information on the educational background and work experience of each venture partner.

We received 127 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 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 1,664 deals made by 124 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 also investments in non-European countries; as a result, our sample consists of a total of 1,430 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 and 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 over 16% is larger than for comparable surveys of industrial firms, as discussed by Graham and Harvey (2001).[6]

Panel B looks at the structure of both sample and population in terms of organizational types. We partition the sample into independent, bank, corporate, and public venture capital firms. As we show in Bottazzi, Da Rin and Hellmann (2004), different types of venture firms behave differently, and we want to make sure that our results are not driven by the sample composition. Our sample closely reflects the distribution of types in the

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

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 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.

Finally, we also consider that our respondents may report only part of their portfolio. To this purpose, in late 2003 we checked the websites of all respondents. When we exclude 15 venture firms whose website 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 elapse 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.

4.2 Data Variables

Table 2 summarizes the definitions of our variables. In this Section we discuss how we construct them. Tables 3 provides the distribution of securities across legal systems, and Table 4 contains descriptive statistics for all the variables used in the analysis.

4.2.1 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 three different dimensions of the venture process: corporate governance, value-adding support, and the choice of securities. Table 2(a) provides formal definitions of these variables

The role of value-adding support (Proposition 1) has also become a central theme in venture capital research (Cassamatta (2003), Hellmann (2000, 2002), Schindele (2004)). For support we use 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.

INTERACTION is a dummy variable that takes the value 1 if the venture capital firm is reported to interact with the company on a monthly or weekly basis; 0 if it interacts with on an annual or quarterly basis. 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.*

Kaplan and Strömberg (2002) 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 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 3 tabulates, by legal system, the types of securities used in our dataset. We clearly see that the use of securities varies 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 increasing in λ, and Lemma 1 shows that the optimal amount of equity held by the venture capitalist, s^*, is decreasing in λ. This implies that the better the legal system, the more the optimal contract places emphasis on downside protection.

While our data does not allow us to measure the exact values d^* and s^*, we can construct proxy variables for the relative importance of downside protection. For this we use the data from Table 3. 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.

DOWNSIDE is a dummy variable that takes the value 1 if the deal includes at least one downside security, and 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.*[7]

The importance of corporate governance and control for venture investing (Proposition 3) has been extensively shown by prior research (Lerner (1995), Hellmann (1998), Hellmann and Puri (2002), Kaplan and Strömberg (2003, 2004)). Our empirical measure of governance and control is whether a venture capitalist has secured contingent control rights that increase his control over the board if the company performs poorly and fails to meet its milestones.

BOARD CONTROL is a dummy variable that takes the value 1 if the venture capital firm is reported to have the contractual right to take control over the board contingent on the occurrence of certain events; 0 otherwise. We obtain the data from our survey instrument, which asked: *does your firm has a right to obtain control of the board of directors contingent on the realization of certain events?* Possible answers were: *Yes, No.*

[7] In the instructions to the survey we specified functional definitions of these different financial instruments in order to ensure consistency of responses.

4.2.2 Independent variables: legal origin and legal indices

We distinguish among three groups of independent variables, whose formal definitions are given in Tables 2(b) through 2(d).

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 dummy variables that classify our companies according to these two categories, using civil law as the default category. Table 2(b) contains their formal definitions.

An alternative approach of classifying legal systems is to use more specific indices, which measure some aspects of the legal system. We use two standard indices: the rule of law and the procedural complexity index. Table 2(c) contains their formal definitions. These two indices relate directly to our concept of the 'quality' of enforcement in a legal system. In our model the parameter $1 - \lambda$ measures the probability with which an entrepreneur can steal from her company without 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.

Our second index measure of the quality of the legal system 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 cheque and evicting a tenant. This index is discussed at length in Djankov et al. (2002) and is published by the World Bank's 'Doing Business' project.

In order to make our results more easily readable, we adopt a linear transformation of the procedural complexity index so that a higher value indicates less complexity. That is, we have an index of 'procedural simplicity,' so that higher index values represent better (i.e., procedurally simpler) legal systems. For both legal origin and the legal indices we construct a variety of measures which allow us to explore the effects of cross-border and cross-system investments. We discuss such measures in more detail in the next Section.

4.2.3 Independent variables: venture firm and company variables

Our second set of independent variables captures investor-level and deal-level effects. Table 2(d) contains their formal definitions. Building on Bottazzi, Da Rin and Hellmann (2004), we focus on the following effects:

INDEPENDENTVC, is a dummy variables that takes the value 1 if the venture capitalist defines itself as an independent venture capital firm; 0 otherwise. We obtain the data from our survey instrument, which asked: *Would you define your firm as (check one):*

Independent venture firm, Corporate venture firm, Bank affiliated venture firm or Other (specify).[8]

VCSIZE is the amount 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 contacting directly 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.

VCAGE is the 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.

Our final set of variables captures the effects of deal-level characteristics.

STAGE is an ordered variable that takes 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.*

INDUSTRY is set of a dummy variables that we obtain the data from our survey instrument, which gave the following choices: *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 (specify).*

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. We discuss this further in section 6.2. Table 4, Panel B, shows the means (or frequency) of our main dependent and independent variables vary across legal origins.

5 Empirical Results

5.1 Company effects

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

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

where i indexes investors and c indexes companies. The dependent variables Y_{ic} measures for investor i in company c the level of INTERACTION, DOWNSIDE, or BOARD CONTROL. We use a Probit model, except for INTERACTION, which is an ordered categorical variable, so we use an ordered probit model. $Legal_c$ is the company's legal

[8] 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 a government company which engages in financing for small businesses, and was classified as public.

measure (its legal origin, rule of law index, or procedural simplicity index), X_i' is a vector of investor characteristics (INDEPENDENTVC, VCSIZE and VCAGE), and X_c' is a vector of company characteristics (STAGE 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 accepting statistically significant results. Clustering also implies the use of heteroskedasticity-robust standard errors.

Our starting point is the legal system of the company. For the legal origin analysis, the baseline case (or omitted category) is a company in a civil law system. We then examine COMPANY-COMMON to measure the differential effect of the company being in a common law system. For the index regressions, COMPANY-RULE and COMPANY-PROCEDURAL measure the quality of the company's legal system.

As suggested by our theory, the legal system may affect outcomes both directly and indirectly, through the competencies of investors, and possibly through the types of companies that exist in a country. To examine the effect of the legal system, our empirical approach therefore distinguishes between the 'direct' effect and the 'total' effect, which also includes the indirect effect—the legal system affecting investor characteristics that in turn affect outcomes. For the total effect we don't want to exclude any influence that the legal system might have on the distribution of companies and investors. To this purpose, we estimate the effect of the legal system deliberately omitting all investor and deal level explanatory variables. For the direct effect, instead, we want to control for the distribution of companies and investors; we thus include all explanatory variables. In terms of company characteristics, we control for industry and stage. In terms of investor characteristics, we control for the age and size of the venture capital firm. Our prior research (Bottazzi, Da Rin and Hellmann (2004)) also shows that an important organizational variable is whether a venture capital firm is independent or captive. Independent venture capital firms are conceived as specialized organizations, whose sole purpose is to maximize profit. Captive venture capital firms are investment vehicles that are used by established firms, banks, or the government, to achieve both profits as well as broader strategic goals (Hellmann (2002), Hellmann, Lindsey, and Puri (2004)). We therefore also control for whether a venture capital firm is independent or not.

In Table 5, column (i) reports the total effects and column (ii) reports the direct effects. Panels A, B and C report, respectively, the results for legal origin, rule of law and procedural simplicity. We find that the legal system has strong effects on all three outcome variables. All coefficients have the sign that is predicted by our theory, and almost all of them are statistically significant. They are also economically large. For example, the probability of downside protection is 31% higher for a common law company than for a civil law company, the probability of contingent board control is 13% higher, and the probability of frequent interactions is 20% higher.[9] For the rule of law index, we find that, relative to a French company, a UK company's probability of downside protection by 14% higher, the probability of contingent board control is 12% higher, and the probability

[9] 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.

of frequent interactions is 25% higher. The procedural index regressions produce similar magnitudes.

Consistent with Propositions 1 to 3, companies in better legal systems receive more support from their investors, give their investors more downside protection, and exercise more control. A comparison of columns (i) and (ii) suggests that the legal system matters both in terms of total and direct effects. The inclusion of the control variables hardly affects significance levels. The direct coefficients in column (ii) are slightly lower than the total coefficients in column (i), suggesting that, overall, indirect effects are present and have a positive effect.

We examine this further by looking at how the legal system affects the control variables. Table 6(a) shows the pairwise correlations between our legal systems measures and company and investor characteristics. There are some significant correlations between the legal systems measures and deal stage.[10] The same applies for investor characteristics. For the investor characteristics we also use a simple regression framework, to examine whether the legal system still matters after we control for company characteristics. Table 6(b) reports those results. The most striking result concerns the statistically and economically significant relationship between the quality of the legal system, and the presence of independent venture capital firms. This is an interesting result by itself. And it provides a good example for a positive indirect effect: Table 6(b) shows that better legal system have more independent venture capital firms, while Table 5 shows that independent venture capital firms have a positive (and mostly significant) effect on the outcome variables.

5.2 Investor home effects

Having established the base effects that a company's legal system has on outcomes, we now ask whether there are any investor effects. In Section 3.3, we have explained why investors that operate in a home market with a better legal system would also want to invest more in acquiring competencies. Based on this, Proposition 4 predicts than an investor's home country is likely to affect his investment style, both when investing at home and abroad. We have called this an investor's "home effect."

Since the majority of investments are made by domestic investors, multi-collinearity prevents us from simply adding the investor's legal system as a separate variable. Instead, we use the additional information contained in investments that are made by investors from different legal systems. Moreover, we distinguish whether an investors comes from a better or worse legal system. We thus modify our empirical model as follows:

$$Y_{ic} = Legal_c\beta_1 + Legal_i^+ * \beta_2 + Legal_i^- \beta_3 + X_i'\beta_i + X_c'\beta_c + \varepsilon_{ic}$$

where

$$Legal_i^+ = Legal_i - Legal_c \text{ for } Legal_i > Legal_c, \text{ otherwise } Legal_i^+ = 0$$
$$Legal_i^- = |Legal_i - Legal_c| \text{ for } Legal_i < Legal_c, \text{ otherwise } Legal_i^- = 0.$$

[10] There are also some significant correlations between the legal systems variables and our twelve industry sectors, which we do not report for simplicity's sake.

As before, $Legal_c$ is the value of the company's legal index, and $Legal_i$ is now the value of the investor's legal index. The variable $Legal_i^+$ measures how much better an investor's legal index is, so that we call these measures BETTER-INVESTOR-RULE and BETTER-INVESTOR-PROCEDURAL. The variable $Legal_i^-$ measures how much worse an investor's legal index is, so that we call these measures WORSE-INVESTOR-RULE and WORSE-INVESTOR-PROCEDURAL.

For the legal origin variable, it is more natural to define the following variables. The default is a civil law company, and we use three dummy variables for common law companies (COMPANY-COMMON), common law investors that invest in civil law countries (INVESTOR-COMMON) and civil law investors that invest in common law countries (INVESTOR-CIVIL). It is easy to verify that these dummy variables provide a complete partitioning of all possible permutations of civil and common law companies and investors.

Table 7 shows the results from the regressions which include investor home effects. The investor effects follow the patterns predicted by Proposition 4. As in Table 5, column (i) reports the total effects and column (ii) reports the direct effects of the legal system. All the coefficients have the expected sign, and most are also statistically significant. Specifically, when investing in a civil law company, investors from common law countries provide more support, and ask for more downside protection and control, relative to civil law investors. Moreover, our data also allows us to examine the inverse scenario. When investing in a common law company, civil law investors provide less support, and ask for less downside protection and control, relative to common law investors. The indices suggest a similar pattern. Investors from better legal systems have a positive effect on the three outcome variables, while investors from worse legal systems have a negative effect. Another interesting finding is that company effects continue not only to have the expected sign, but in most cases also retain their statistical significance. In terms of economic significance, the company-level legal variables from Table 5 remain similar in size. Investor home effects are also economically large. For example, attracting a common law investor into a civil law country increases the probability of downside protection by 30%, the probability of contingent board control by 32%, and the probability of frequent interactions by 24%. By contrast, attracting a civil law investor in a common law country decreases the probability of downside protection by 27%, the probability of contingent board control by 31%, and the probability of frequent interactions is 42%. The rule of law and procedural index regressions produce effects of similar size.

Overall, these findings provide strong support for Proposition 4, namely for the existence of a strong 'home effect' which makes investors bring their investment competencies with them when investing in a different legal system.

5.3 Within civil countries effects

The literature on legal systems is typically focused on the distinction between common and civil law countries. But if legal systems truly matter, their effect should not be driven solely by the distinction between common and civil law countries. Indeed, if we could identify effects of the legal system within the subset of civil law countries, this would further strengthen the case for the importance of legal systems.

Our data allow us to extend our analysis and look at the differences among civil law countries. To this purpose, we consider only the subsample of companies in civil law countries that receive financing from civil law venture capital firms. There are three groups of civil law legal systems: the French, the German and the Scandinavian system. The work of LaPorta et. al. (1998) accords the Scandinavian system the highest quality, followed by the German and then by the French. We use the Scandinavian system as the default category, and examine the differential effect of the German and French systems. There are too few observations to estimate a separate effect for Scandinavian investors investing abroad. We therefore limit investor effects to the German and French systems. We use dummies for companies in French legal origin countries (COMPANY-FRENCH), for companies in German legal origin countries (COMPANY-GERMAN), for investors from French legal origin countries that invest in other civil law countries (INVESTOR-FRENCH), for investors from German legal origin countries that invest in other civil law countries (INVESTOR-GERMAN). These four dummies provide a complete partitioning of all possible permutations of civil law companies and investors.

Table 8 shows the regression results. Column (i) estimates total effects, similar to column (i) in Table 5; column (ii) estimates direct effects, similar to column (ii) in Table 5; and column (iii) estimates investor home effects, similar to column (ii) in Table 7. The main result is that the pattern of coefficients, predicted by our theoretical model, remains intact. The number of observations is clearly reduced, which may account for the slight loss of statistical significance for some of the coefficients. Table 8 shows that even among civil law countries differences in the legal system matter. Indeed, it shows that effects are particularly strong for companies and investors in the French system. This result considerably strengthens the main hypothesis of the paper. It also extends the findings of LS and KMS, who rely more heavily on the investments of US and UK investors to identify the effects of the legal system. More generally, it points to the importance for the law and finance literature to broaden its perspective and consider the effect of legal differences on a more fine grained way.

5.4 Are international investors different?

We may ask to what extent our results might be driven by investor differences that are still not captured by our investor controls. In particular, a relevant question is whether investors who cross country boundaries are inherently different from their domestic counterparts.

Table 7 shows that investors that come from a stronger legal system provide more support, ask for more downside protection, and exercise more control relative to domestic investors in the company's country. And there is an equivalent negative effect for investors from a weaker legal system. We may question whether the investor home effect is not due to some other investor characteristics that have less to do with the investor's home country, but are instead common to all international investors. To examine this, we construct a measure of investor's international orientation. For each venture capital firm, we calculate the share of foreign deals that we observe in our sample.

Table 9 reports regressions similar to those in Table 7 but with the addition of a variable

which measures the share of international deals of the venture capital firm involved in the deal (INTERNATIONALVC). First and foremost, we find that the basic company and investor effects of Table 7 remain essentially unaffected. In addition, we find that the investors' international shares have small and largely insignificant effects.

We ran several robustness checks on these regression. We redefined the international share variable to include US deals;[11] we used dummy variables instead of shares; we used the number of international deals instead of shares; and we also reran the regression in an augmented sample that includes the US deals themselves. While the strength of the coefficients for the international variable differs somewhat across these permutations, the basic pattern of results remains intact.

In a related vein, KMS find that whether or not an investor has any US experience affects his investment activities. They interpret this as a sophistication effect. We reran our regression, replacing our international measures with US measures. The results were again very similar. We also used an alternative measure of US experience, asking whether any of the venture capital firm's partners had previously has worked in the US. Again we find that our results are not affected by including this measure.

The analysis so far controls for different types of investor. We can go one step further, and control for each investor separately. This means using investor fixed effects, which in our case requires a conditional logit model.[12] The advantage of this estimation approach is that it relies only on variation within investor portfolios, and can tell us how a given investor adapts his investment style when financing companies in a better or worse legal system. We should also notice that, by construction, the conditional logit cannot estimate the effects of the investors' legal system themselves. Put differently, the conditional logit addresses a different question than our previous models, namely to what extent investors adapt their behavior as they invest across different countries. Because the conditional logit requires variation within venture portfolios, the number of observations is lower. The statistical power of these regressions is also lower. In unreported regressions we find that most of the coefficients are insignificant. The only significant coefficients are for investors from worse legal systems, where the rule of law coefficient is negative significant in the INTERACTION regresssion, and the procedural simplicity coefficient is negative significant in the BOARD and INTERACTION regressions. However, these negative coefficients disappear once we apply the robustness checks of Section 6. Overall, the conditional logit regressions suggest that there is relatively little variation within venture capital firms—the main variation comes from differences across venture capital firms. This further demonstrates the importance of investor home effects, and the fact that investors retain their investment styles when investing abroad.

[11] There are 160 investments made by our European venture firms in US companies.

[12] Since the INTERACTION variable is actually a categorical variable, we condense it into two categories, one for weekly or monthly interactions, the other for quarterly or yearly interactions. We also reran all of the conditional logits as linear regression models with fixed effects and obtained very similar results.

6 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.

One important question for the legal systems literature 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 governance or asking for downside protection, are actually precluded by the legal system. The first three rows of Table 3 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 important alternative interpretation of our results—that the legal systems matters because it simply doesn't allow investors to take certain actions.

In section 4 we show that our sample represents well the underlying population. With a hand-collected dataset there are always missing observations for individual data items. While we made a great effort to complete missing observations, we are still left with different numbers of observations across variables. To verify that this does not induce a selectivity bias we perform additional tests. We estimate a Heckman's two-step method, using the maximum likelihood approach. In the first step an ordinary Probit model is used to obtain consistent estimates of the selection equation. We find no particular patterns of the missing observations. Still, we perform a variety of checks on the second step, and verify that there is no correlation between the selection equation and our main regressions. We cannot find any evidence that our results are affected by sample selection problems.

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 variables. We did numerous additional checks to see whether other variables affect our results.

Our base model controls for the stage of the deal and the sector the company operates in. Instead of using stage, one can use the closely related (and correlated) measure of company age, and obtain analogous results.

One concern might be that our sample period includes the "dotcom" period. Although still over-hyped, the dotcom wave was much smaller in Europe than in the US. Nonetheless we ask whether time periods affect our results. For this we add a set of time dummies (one for each sample year), but find that they do not affect our results. It might also be argued that the dotcom period involved software deals that do not fit the traditional notion of a high-tech deal. We reran our regressions dropping all deals in the Internet and software industry; we lose almost 30% of the observations but our results are virtually unchanged. A further concern is that our results are driven by differences across countries in terms of

stage of development. Though our sample consists of rather homogeneous countries in this respect, we include in our regressions the per-capita level of the Gross Domestic Product (GDP) of the venture capital firm' country; we repeat this exercise using the GDP of the portfolio company's country. None of our results is affected.

Another deal-related concern is that venture capitalists may assume different roles, depending on syndicate structures. For example, one might worry that lower levels of involvement in foreign deals are due to the investor not assuming the lead investor role. For the deals where we have the data, we include two additional controls, one for whether a deal is syndicated, and one for whether the investor is the lead syndicator. Again we find that this does not affect our results.

Kaplan and Strömberg (2003) note that the size of an investor's stake affects his incentive to be involved with the company. While we do not have data on equity stakes, we do have some data on the amount of money invested, which is likely to be correlated with the equity stake. First, we consider the total amount of money that a venture capitalist invests in the deal. Second, we consider what percentage of the total money raised in the round is provided by our investor. Again, we find that including these additional variables does not affect our main results.

We have used a rule of law index developed by the World Bank that is widely used in the economics literature. Still, we want to check that our results do not depend on the nature of this particular index. To this purpose, we reran our regressions using an update version of the rule of law index adopted by LaPorta et. al. (1998), which is published in the International Country Risk Guide produced by the Political Risk Services Group. We obtained qualitatively very similar results.

We also did some robustness checks on our dependent variables. In the construction of our downside measure we have 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. We use this 'exclusive' measure in our regression and find no change in the results. Our measure of downside protection aggregates across a number of securities. It is possible to provide a more detailed ranking for the strength of downside protection, or degree of concavity. It is commonly argued that debt is the most concave, that preferred equity and convertible debt are less concave, that equity is linear, and that warrants are convex. We thus construct a simple categorical proxy for concavity (1 for debt, 2 for convertible debt and preferred equity, 3 for equity and 4 for warrants). For our base measure of downside protection we build the concavity proxy on the most concave instrument used. For the 'exclusive' measure we use the concavity of the main instrument. To estimate our models with the concavity measures we use an ordered Probit. We find that none of our results were affected by replacing the downside measures with these concavity measures.

7 Conclusion

In this paper we develop a theory of how the legal system affects optimal contracts, investor involvement, and their incentives to invest in value-adding competencies. 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. We show that not only does the company's legal system matter, the investor's legal system matters too. Moreover, the effect of the legal system operates not only directly through individual contracts and actions, but also more broadly by affecting the way financial intermediaries develop their own skills and capabilities.

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 the non-contractual aspects provides a stimulus for further work on how legal systems affects financial intermediation more broadly.

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 touted as the leading example of a modern venture capital industry. As policy makers from around the world have strived to emulate the US model, they have frequently encountered numerous problems. Indeed, in the European context, there has been a lively debate about the feasibility and desirability of imitating the US venture capital model. Our theoretical and empirical analysis clarifies the limits of this imitation process. Many countries may want to foster US-style venture capital, but they rarely have in place a comparable legal system. We provide evidence that investors endogenously choose different investment styles. In the absence of reforms that strengthen the legal system, blind imitation of US venture capital practices is therefore unlikely to succeed.

Appendix

Proof of Proposition 2:

We note that d^* is determined by $u_E(d^*) = \gamma_G + (1-s)(a-d^*) + p\pi(\Lambda - \lambda s) - c_E - k_E = 0$. Totally differentiating w.r.t. λ we obtain $\frac{du_E}{d\lambda} + \frac{du_E}{dd^*}\frac{dd^*}{d\lambda} = 0 \Leftrightarrow \frac{dd^*}{d\lambda} = \frac{1}{1-s}\frac{du_E}{d\lambda}$. We have $\frac{du_E}{d\lambda} = \frac{\partial u_E}{\partial \lambda} + \frac{\partial u_E}{\partial s^*}\frac{\partial s^*}{\partial \lambda} + \frac{\partial u_E}{\partial e^*}\frac{\partial e^*}{\partial \lambda} + \frac{\partial u_E}{\partial v^*}\frac{\partial v^*}{\partial \lambda}$. Using $\frac{\partial u_E}{\partial \lambda} = p\pi(\phi - s)$, $\frac{\partial u_E}{\partial s^*} = -(a-d^*) - \lambda p\pi$, $\frac{ds^*}{d\lambda} = -\frac{p_V^2}{p_E^2 + p_V^2}\frac{1-\phi}{\lambda^2} = -s^*\frac{1-\phi}{\lambda\Lambda}$, $\frac{\partial u_E}{\partial e^*} = 0$, $\frac{\partial u_E}{\partial v^*} = p_V\pi(\Lambda - \lambda s)$ and $\frac{dv^*}{d\lambda} = \frac{p_V^3}{p_E^2 + p_V^2}\phi\pi = p_V s^*\frac{\lambda}{\Lambda}\phi\pi$ we obtain $\frac{du_E}{d\lambda} = p\pi(\phi - s) + (a-d^*)s^*\frac{1-\phi}{\lambda\Lambda} + p\pi s^*\frac{1-\phi}{\Lambda}$ $+p_V^2(\Lambda - \lambda s^*)s^*\frac{\lambda}{\Lambda}\phi\pi^2$. The second and fourth terms are always positive. The first and third term can be combined as $\frac{p\pi}{\Lambda}[\Lambda\phi - \Lambda s^* + s^* - \phi s^*]$. Using $1 - \Lambda = (1-\lambda)\phi$ we obtain $\frac{p\pi}{\Lambda}[\Lambda\phi + (1-\lambda)\phi s^* - \phi s^*] = \frac{p\pi\phi}{\Lambda}[\Lambda - \lambda s^*] > 0$. It follows that $\frac{du_E}{d\lambda} > 0$ and thus $\frac{dd^*}{d\lambda} > 0$. ∎

The role of bargaining power.

To see the importance of bargaining power, suppose instead that d^* is determined by the generalized Nash bargaining solution, where μ measures the venture capitalist's bargaining power. The Nash solution maximizes $u_V^{\mu}u_E^{1-\mu}$, which yields after standard transformations the following first order condition: $\mu u_E - (1-\mu)u_V = 0$. Totally differentiating this w.r.t. λ and d^* we obtain after further transformations $\frac{dd^*}{d\lambda} = \frac{1}{1-s}[\mu\frac{du_E}{d\lambda} - (1-\mu)\frac{du_V}{d\lambda}]$. For $\mu = 1$ we regain the above framework. For $\mu < 1$, we also have to take $\frac{du_V}{d\lambda}$ into account. We have $\frac{du_V}{d\lambda} = \frac{\partial u_V}{\partial \lambda} + \frac{\partial u_V}{\partial s^*}\frac{\partial s^*}{\partial \lambda} + \frac{\partial u_V}{\partial e^*}\frac{\partial e^*}{\partial \lambda} + \frac{\partial u_V}{\partial v^*}\frac{\partial v^*}{\partial \lambda}$. Using $\frac{\partial u_V}{\partial \lambda} = p\pi s$, $\frac{\partial u_V}{\partial s^*} = (a-d^*) + p\pi\lambda$, $\frac{ds^*}{d\lambda} = -\frac{p_V^2}{p_E^2 + p_V^2}\frac{1-\phi}{\lambda^2} = -s^*\frac{1-\phi}{\lambda\Lambda}$, $\frac{\partial u_V}{\partial e^*} = p_E\pi\lambda s$, $\frac{\partial e^*}{\partial \lambda} = \frac{p_E^3}{p_E^2 + p_V^2}\phi\pi$ and $\frac{\partial u_V}{\partial v^*} = 0$ we obtain $\frac{du_V}{d\lambda} = p\pi s^* - (a-d^*)s^*\frac{1-\phi}{\lambda\Lambda} - p\pi s^*\frac{1-\phi}{\Lambda} + \lambda s^*\frac{p_E^4}{p_E^2 + p_V^2}\phi\pi^2$, which we can rewrite as $\frac{du_V}{d\lambda} = p\pi s^*\frac{\phi\lambda}{\Lambda} - (a-d^*)s^*\frac{1-\phi}{\lambda\Lambda} + \lambda s^*\frac{p_E^4}{p_E^2 + p_V^2}\phi\pi^2$. The first and third term are positive, but the second term is negative. Let $A = p\frac{\phi}{1-\phi}\pi\lambda^2 + \frac{p_E^4}{p_E^2 + p_V^2}\frac{\phi}{1-\phi}\pi^2\lambda^2\Lambda$, then $\frac{du_V}{d\lambda} < 0$ whenever $a - d^* > A$, which is equivalent to $d^* < a - A$. If this condition holds, then we always have $\mu\frac{du_E}{d\lambda} - (1-\mu)\frac{du_V}{d\lambda} > 0$ and thus $\frac{dd^*}{d\lambda} > 0$ continues to apply. For $d^* > a - A$, however, there exists $\widehat{\mu}$, so that $\frac{dd^*}{d\lambda} > 0$ requires $\mu > \widehat{\mu}$. For $d^* > a - A$ and $\mu < \widehat{\mu}$, we obtain $\frac{dd^*}{d\lambda} < 0$.

The intuition for why d^* is mostly increasing in λ is as follows. Higher λ reduces

inefficient loss of value due to stealing. From Lemma 1, higher values of λ decrease s^*. A higher value of λ will thus always benefit the entrepreneur, i.e., $\frac{du_E}{d\lambda} > 0$. If d^* is small, then $a - d^*$ is large, so that a higher value of λ hurts the venture capitalist, because of the lower equity share s^*. In this case we have $\frac{du_V}{d\lambda} < 0$, and the sign of $\frac{dd^*}{d\lambda}$ is unambiguous. But for large values of d^*, the lower equity stake does not hurt the venture capitalist, so that $\frac{du_V}{d\lambda} > 0$. In this case, $\frac{dd^*}{d\lambda}$ depends on relative bargaining power. If the venture capitalist has low bargaining power ($\mu < \widehat{\mu}$), then the entrepreneur takes more of the debt, since the venture capitalist's required returns are already met by the increase in λ. But if the venture capitalist has more bargaining power ($\mu > \widehat{\mu}$), then he can extract the benefits of a better legal system through higher debt levels.

Analysis of the model where the entrepreneur's wealth constraint is binding.

Consider the constrained model, where $d = a$ and $u_E(s^*) > 0$. The venture capitalist maximizes $u_V = a + p\pi\lambda s - c_V - k_V$, subject to $u_E = \gamma_G + p\pi(\lambda + (1-\lambda)(1-\phi) + \lambda s) - c_E - k_E = 0$. Using the optimal choices $e = p_E\pi(\Lambda - \lambda s)$ and $v = p_V\pi\lambda s$, we have $(p_G + p_E^2\pi(\Lambda - \lambda\widehat{s}) + p_V^2\pi\lambda\widehat{s})\pi(\Lambda - \lambda\widehat{s}) - \frac{(p_E\pi(\Lambda - \lambda\widehat{s}))^2}{2} + \gamma_G - k_E = 0$. Using $\widehat{S} = \lambda\widehat{s}$, this simplifies to $u_E(\widehat{S}) = \pi p_G(\Lambda - \widehat{S}) + \pi^2 p_V^2\widehat{S}(\Lambda - \widehat{S}) + \pi^2 p_E^2\frac{(\Lambda - \widehat{S})^2}{2} + \gamma_G - k_E = 0$. Note that $u_E(\widehat{S})$ is decreasing in $\widehat{S}$, and increasing in Λ. An increase in λ increases Λ, which will thus require an increase in $\widehat{S}$. From $v = p_V\pi\widehat{S}$, we note that this also increases the optimal choice of v. Thus Proposition 1 remains valid. For Proposition 3 we note that there is an additional benefit of control. With control, the venture capitalist has to take a smaller equity stake, one that is closer to s^*. This increases efficiency. Formally, we have $u_1 - u_0 = (p_1 - p_0)\pi\Lambda + \eta(\widehat{s}_1) - \eta(\widehat{s}_0) - \Gamma$ where $\eta(\widehat{s}) = [p_E e^*(\widehat{s}) + p_V v^*(\widehat{s})]\pi\Lambda - c_E(e^*(\widehat{s})) - c_V(v^*(\widehat{s}))$. Naturally, $\eta(\widehat{s})$ is highest at s^*. Since $\widehat{s}_0 > \widehat{s}_1 \geq s^*$, we have $\eta(\widehat{s}_1) > \eta(\widehat{s}_0)$. The critical value $\widehat{\Gamma}$ is now simply given by $\widehat{\Gamma} = (p_1 - p_0)\pi\Lambda + \eta(\widehat{s}_1) - \eta(\widehat{s}_0)$. ∎

Proof of Proposition 4:

Part (i): Note that in equilibrium we have $u_E = 0$, so that $u_V = u$, yielding $\frac{du_V}{d\lambda} = \frac{du}{d\lambda}$. We use the optimal values $e^* = p_E\pi(\Lambda - \lambda s)$ and $v^* = p_V\pi\lambda s$ to obtain $u = a + (p_G + p_E^2\pi(\Lambda - \lambda s) + p_V^2\pi\lambda s)\pi\Lambda - \frac{(p_E\pi(\Lambda - \lambda s))^2}{2} - \frac{(p_V\pi\lambda s)^2}{2} + \gamma_G - k_E - k_V$. From the envelope theorem we have $\frac{du}{ds^*} = 0$. Thus $\frac{du_V}{dp_1} = \frac{du}{dp_1} = \pi\Lambda > 0$ for $\Gamma < \widehat{\Gamma}$ and $\frac{du_V}{dp_1} = 0$ for $\Gamma > \widehat{\Gamma}$. Moreover, $\frac{du_V}{dp_V} = \frac{du}{dp_V} = p_V\pi^2\lambda s(2\Lambda - \lambda s) > 0$. We have thus established that u_V is increasing in p_1 and p_V. The optimal levels of p_1 and p_V are determined by $\int \frac{du_V}{dp_1}d\Omega(\lambda, x) = C_1'$ and $\int \frac{du_V}{dp_V}d\Omega(\lambda, x) = C_V'$. To see how these optimal

choices depend on the distribution of λ, we simply note that $\frac{d^2u_V}{dp_1 d\lambda} = \phi\pi > 0$ for $\Gamma < \widehat{\Gamma}$ and $\frac{d^2u_V}{dp_1 d\lambda} = 0$ for $\Gamma > \widehat{\Gamma}$. Moreover, $\frac{d^2u_V}{dp_V d\lambda} = 2\Lambda\phi\frac{p_V^2}{p_E^2+p_V^2}(2 - \frac{p_V^2}{p_E^2+p_V^2}) > 0$. The marginal benefit of investing in p_1 and p_V is thus an increasing function of λ. If follows that the optimal choice of p_1 and p_V are always higher for any first order stochastic dominant shift with respect to λ.

Part (ii): We evaluate the comparative statics of v^*, $\widehat{\Gamma}$ and d^* w.r.t. p_1 (for $\Gamma < \widehat{\Gamma}$) and p_V. From $v^* = \frac{p_V^3}{p_E^2+p_V^2}\Lambda\pi$ we note that $\frac{dv^*}{dp_1} = 0$ and $\frac{dv^*}{dp_V} = \frac{3p_V^2p_E^2+5p_V^4}{(p_E^2+p_V^2)}\Lambda\pi > 0$. From $\widehat{\Gamma} = (p_1 - p_0)\pi\Lambda$ we have $\frac{d\widehat{\Gamma}}{dp_1} = \pi\Lambda$ and $\frac{d\widehat{\Gamma}}{dp_V} = 0$. Totally differentiating $u_E(d^*) = 0$ w.r.t. p_1, we have $\frac{dd^*}{dp_1} = \frac{\pi(\Lambda-\lambda s)}{1-s} > 0$. Finally, to see that the effect of p_V on d^* is ambiguous, note that $\frac{dd^*}{dp_V} = \frac{1}{1-s}\frac{du_E}{dp_V}$ as before. We have $\frac{du_E}{dp_V} = \frac{\partial u_E}{\partial p_V} + \frac{\partial u_E}{\partial s^*}\frac{\partial s^*}{\partial p_V} + \frac{\partial u_E}{\partial e^*}\frac{\partial e^*}{\partial p_V} + \frac{\partial u_E}{\partial v^*}\frac{\partial v^*}{\partial p_V}$. Using $\frac{\partial u_E}{\partial p_V} = v^*\pi(\Lambda-\lambda s) > 0$, $\frac{\partial u_E}{\partial s^*} = -(a-d^*) - \lambda p\pi$, $\frac{ds^*}{dp_V} = \frac{\Lambda}{\lambda}\frac{2p_Vp_E^2}{(p_E^2+p_V^2)} > 0$, $\frac{\partial u_E}{\partial e^*} = 0$, $\frac{\partial u_E}{\partial v^*} = p_V\pi(\Lambda-\lambda s)$ and $\frac{dv^*}{dp_V} = \frac{3p_V^2p_E^2+5p_V^4}{(p_E^2+p_V^2)}\Lambda\pi > 0$ we obtain $\frac{du_E}{dp_V} = p_V\lambda s(\Lambda-\lambda s)\pi^2 - [a-d^*+\lambda p\pi]\frac{\Lambda}{\lambda}\frac{2p_Vp_E^2}{(p_E^2+p_V^2)} + p_V\pi(\Lambda-\lambda s)\frac{3p_V^2p_E^2+5p_V^4}{(p_E^2+p_V^2)}\Lambda\pi$. The second term is negative. Depending on the size of a, it might be bigger or smaller than the sum of the first and third term. The reason for the ambiguity is that a higher value of p_V already requires a higher value of s (i.e. giving the venture capitalist more equity). Whether it also requires a higher value of debt is ambiguous. ∎

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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 Table 2. 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	5	14.7%
Denmark	29	4	13.8%
Finland	33	6	18.2%
France	101	15	14.9%
Germany	146	19	13.0%
Greece	8	4	50.0%
Ireland	15	3	20.0%
Italy	37	6	16.2%
Luxembourg	3	1	33.3%
The Netherlands	52	5	9.6%
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	22	15.8%
TOTAL	*750*	*124*	*16.5%*

Panel B: COMPOSITION BY VENTURE FIRM TYPE

	POPULATION	SAMPLE
Independent	65.7%	67.7%
Corporate	8.0%	9.7%
Bank	19.3%	17.8%
Public	6.9%	4.8%

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	179.8	52	2	4,500

Table 2(a): Dependent variables

Variable	Description
INTERACTION	ordered categorical variable that takes the values 1 to 4 if the venture firm interacts with the portfolio company monthly, weekly, quarterly, and annually.
DOWNSIDE	dummy variable that takes the value 1 if the the finacing instruments used for the deal include straight debt, convertible debt, or preferred equity; 0 otherwise.
BOARD CONTROL	dummy variable that takes the value 1 if the venture capitalist is reported to have a contractual right to obtain control of the board if the company fails to meet a specified contingency; 0 otherwise.

Table 2(b): Independent variables: Legal origin

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); 0 otherwise.
COMPANY–FRENCH	dummy variable that takes the value 1 if the company is located in a country with French legal origin, from Laporta et al. (1998); 0 otherwise.
COMPANY–GERMAN	dummy variable that takes the value 1 if the company is located in a country with German legal origin, from Laporta et al. (1998); 0 otherwise.
INVESTOR–COMMON	dummy variable equal to 1 if the venture investor is located in a legal system of common law and the portfolio company in a legal system of civil law; 0 otherwise.
INVESTOR–CIVIL	dummy variable equal to 1 if the venture investor is located in a legal system of civil law and the portfolio company in a legal system of common law; 0 otherwise.
INVESTOR–FRENCH	dummy variable equal to 1 if the venture investor is located in a country with French legal origin and the portfolio company in a country with a different legal system of civil law; 0 otherwise.
INVESTOR–GERMAN	dummy variable equal to 1 if the venture investor is located in a country with German legal origin and the portfolio company in a country with a different legal system of civil law; 0 otherwise.

Table 2(c): Independent variables: Legal indices

Variable	Description
COMPANY–RULE	measure of the quality of enforcement of legal rules in the country of the portfolio company; based on an on an index ranging from –2.5 to 2.5 developed by the World Bank and described in Kaufmann et al. (2002).
BETTER-INVESTOR–RULE	variable equal to the difference of the rule-of-law index for the investor and for the portfolio company if the difference is positive; 0 otherwise.
WORSE-INVESTOR–RULE	variable equal to absolute value of the difference of the rule-of-law index for the investor and for the portfolio company if the difference is negative; 0 otherwise.
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. Rescaled to an index of procedural simplicity by subtracting the original value from 100, so that a higher (rescaled) value corresponds to a less formal (i.e., better) legal system.
BETTER-INVESTOR–PROCEDURAL	variable equal to the difference of the procedural simplicity index for the investor and for the company if the difference is positive; 0 otherwise.
WORSE-INVESTOR–PROCEDURAL	variable equal to the absolute value of the difference of the procedural simplicity index for the investor and for the company if the difference is negative; 0 otherwise.

Table 2(d): Independent variables: investor–level and deal level controls

Variable	Description
INDEPENDENTVC	dummy variable that takes the value 1 if the venture capitalist defines itself as an independent venture firm; 0 otherwise.
INTERNATIONALVC	is the share of a venture capital firm's investments made abroad
VC–SIZE	is the amount under management at the venture capital firm.
VC–AGE	is the age of the venture capital firm, measured in months at the end of the sample period.
STAGE	ordered dummy variable that takes the values 1 to 4 if a deal is reported as a seed, start-up, expansion, or bridge.
INDUSTRY	set of a mutually exclusive dummy variables that take the value 1 if the company is reported to operate in one the following industries 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; 0 otherwise.

Table 3: Frequency of securities used as financing instruments, by legal system

This Table provides the frequency with which the five securities are used, by the legal system of the company financed (i.e., by column). The table provides the frequency for all the financing instruments used in a deal, so that frequencies sum to more than 1. Variables are defined in Table 2.

	Common	Civil			
Security:	Anglo-Saxon	French	German	Scandinavian	*Obs*
Straight Debt	.251	.052	.092	.069	*1,430*
Convertible debt	.138	.131	.157	.190	*1,430*
Preferred equity	.489	.269	.167	.347	*1,430*
Pure equity	.546	.757	.877	.742	*1,430*
Warrants	.063	.131	.071	.055	*1,430*
Obs	*228*	*610*	*342*	*250*	*1,430*

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. Variables are defined in Table 2.

Panel A: DESCRIPTIVE STATISTICS

VARIABLE	MEAN	MEDIAN	MIN	MAX	*OBS*
Interaction	0.705	-	0	1	*1,259*
Downside	0.441	-	0	1	*1,401*
Board Control	0.390	-	0	1	*1,272*
Company–Common	0.159	-	0	1	*1,430*
Investor–Common	0.024	-	0	1	*1,430*
Investor–Civil	0.025	-	0	1	*1,430*
Investor French	0.039	-	0	1	*1,430*
Investor German	0.016	-	0	1	*1,430*
Company–Rule	1.753	1.9	0.66	2.36	*1,430*
Better–Investor–Rule	0.019	0	0	1,07	*1,430*
Worse–Investor–Rule	0.030	0	0	1,07	*1,430*
Company–Procedural	41.263	39	17	64	*1,424*
Better–Investor–Procedural	1.025	0	0	43	*1,420*
Worse–Investor–Procedural	1.458	0	0	47	*1,420*
IndependentVC	0.573	-	0	1	*1,430*
InternationalVC	0.183	0.069	0	1	*1,430*
VC–Size	243.864	85	1.3	4,500	*1,418*
VC–Age	92.599	54	12	390	*1,430*
Stage	2.244	2	1	4	*1,265*
Biotech and pharma	0.142	-	0	1	*1,419*
Medical products	0.069	-	0	1	*1,419*
Software and Internet	0.299	-	0	1	*1,419*
Financial services	0.038	-	0	1	*1,419*
Industrial services	0.040	-	0	1	*1,419*
Electronics	0.058	-	0	1	*1,419*
Telecom	0.071	-	0	1	*1,419*
Consumer services	0.123	-	0	1	*1,419*
Food and consumer goods	0.023	-	0	1	*1,419*
Industrial products	0.014	-	0	1	*1,419*
Media & entertainment	0.065	-	0	1	*1,419*
Other sector	0.069	-	0	1	*1,419*

Panel B: MEAN VALUES, BY LEGAL SYSTEM

	Common	Civil			
VARIABLE	Anglo-Saxon	French	German	Scandinavian	*Obs*
Interaction	0.874	0.523	0.808	0.836	*1,259*
Downside	0.745	0.344	0.336	0.536	*1,401*
Board Control	0.519	0.270	0.460	0.433	*1,272*
Investor–Common	0	0.028	0.029	0.032	*1,430*
Investor–Civil	0.158	0	0	0	*1,430*
Investor French	–	–	0.073	0.028	*1,202*
investor German	–	0.009	–	0.028	*1,202*
Company–Rule	2.024	1.410	1.987	2.023	*1,430*
Better-Investor–Rule	0.013	0.028	0.012	0.012	*1,430*
Worse-Investor–Rule	0.055	0.010	0.056	0.021	*1,430*
Company–Procedural	63.342	26.680	42.134	55.168	*1,424*
Better-Investor–Procedural	0.079	1.602	1.052	.464	*1,424*
Worse-Investor–Procedural	3.877	0.564	1.886	0.816	*1,424*
IndependentVC	0.767	0.446	0.667	0.576	*1,430*
InternationalVC	0.185	0.178	0.202	0.167	*1,430*
VC–Size	127.329	340.846	199.925	176.300	*1,418*
VC–Age	93.167	105.505	77.956	80.624	*1,430*
Stage	2.366	2.299	2.130	2.156	*1,265*
Company age	40.576	72.987	48.683	44.611	*1,078*

Table 5: Base model

This table reports results from (ordered) probit regressions for our base model. The dependent variables are INTERACTION, DOWNSIDE, and BOARD CONTROL. For each independent variable, column *(i)* reports the estimated coefficients for a model without investor and deal controls; column *(ii)* reports the estimated coefficients for a model with investor and deal controls. Panel A reports results for legal origin. The main independent variable is COMPANY–COMMON. Panel B reports results for rule of law. The main independent variable is COMPANY–RULE. Panel C reports results for procedural simplicity. The main independent variables is COMPANY–PROCEDURAL. Investor controls are INDEPENDENTVC, VC–AGE, AND VC–SIZE. Deal Controls (unreported) are STAGE and INDUSTRY. Variables are defined in Table 2. 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: Legal origin

	INTERACTION		DOWNSIDE		BOARD CONTROL	
	(i)	*(ii)*	*(i)*	*(ii)*	*(i)*	*(ii)*
Company–Common	0.411**	0.324*	0.956***	0.823***	0.394	0.358
	(2.27)	*(1.90)*	*(4.84)*	*(3.83)*	*(1.22)*	*(1.02)*
IndependentVC		0.655***		0.576**		0.050
		(2.97)		*(2.23)*		*(0.15)*
VC–Size		–0.001		0.001		–0.001**
		(–0.95)		*(0.26)*		*(–2.06)*
VC–Age		–0.005***		0.003		–0.007***
		(–3.89)		*(1.52)*		*(–2.96)*
Deal Controls	No	Yes	No	Yes	No	Yes
Observations	*1,259*	*1,105*	*1,401*	*1,233*	*1,272*	*1,123*
χ^2	*5.13*	*63.80*	*23.40*	*54.54*	*1.48*	*45.70*
Model p–value	*0.024*	*0.001*	*0.000*	*0.000*	*0.223*	*0.000*
Pseudo R^2	*0.009*	*0.120*	*0.053*	*0.115*	*0.010*	*0.148*

Panel B: Rule of Law

	INTERACTION		DOWNSIDE		BOARD CONTROL	
	(i)	*(ii)*	*(i)*	*(ii)*	*(i)*	*(ii)*
Company–Rule	0.931***	0.774***	0.789**	0.639**	0.698*	0.693*
	(3.95)	*(2.90)*	*(2.53)*	*(2.23)*	*(1.85)*	*(1.72)*
IndependentVC		0.594***		0.603**		0.017
		(2.82)		*(2.27)*		*(0.95)*
VC–Size		–0.001		0.001		–0.001
		(–1.25)		*(0.02)*		*(–1.62)*
VC–Age		–0.005***		0.003		–0.006***
		(–4.36)		*(1.62)*		*(–2.83)*
Deal Controls	No	Yes	No	Yes	No	Yes
Observations	*1,259*	*1,105*	*1,401*	*1,233*	*1,272*	*1,123*
χ^2	*15.62*	*99.52*	*6.39*	*46.14*	*3.43*	*46.79*
Model p–value	*0.000*	*0.000*	*0.012*	*0.000*	*0.064*	*0.000*
Pseudo R^2	*0.038*	*0.136*	*0.033*	*0.096*	*0.026*	*0.159*

Panel C: Procedural simplicity

	INTERACTION		DOWNSIDE		BOARD CONTROL	
	(i)	*(ii)*	*(i)*	*(ii)*	*(i)*	*(ii)*
Company–Procedural	0.931***	0.774***	0.018**	0.017***	0.016**	0.016*
	(3.95)	*(2.90)*	*(2.27)*	*(2.57)*	*(1.97)*	*(1.90)*
IndependentVC		0.593***		0.572**		0.006
		(2.82)		*(2.25)*		*(0.02)*
VC–Size		–0.001		0.001		–0.001
		(–1,25)		*(0.31)*		*(–1.61)*
VC–Age		–0.005***		0.003*		–0.006***
		(–4.36)		*(1.70)*		*(–2.90)*
Deal Controls	No	Yes	No	Yes	No	Yes
Observations	*1,259*	*1,105*	*1,395*	*1,227*	*1,267*	*1,118*
χ^2	*15.62*	*99.52*	*5.13*	*53.27*	*3.86*	*46.80*
Model p–value	*0.001*	*0.000*	*0.024*	*0.000*	*0.049*	*0.000*
Pseudo R^2	*0.038*	*0.136*	*0.039*	*0.113*	*0.032*	*0.161*

√

Table 6(a): Pairwise correlations between legal systems and investor and deal characteristics

This table reports pairwise correlations among the legal variables and investor and deal characteristics. Variables are defined in Table 2. Significance levels are reported in brackets.

	COMPANY-COMMON	COMPANY-RULE	COMPANY-PROCED.	INDEPENDENTVC	VC–AGE	VC–SIZE	STAGE
COMPANY-COMMON	1.000						
COMPANY-RULE	0.339 *(0.00)*	1.000					
COMPANY-PROCED.	0.587 *(0.00)*	0.754 *(0.00)*	–1.000				
INDEPENDENTVC	0.171 *(0.00)*	0.195 *(0.00)*	0.231 *(0.00)*	1.000			
VC–AGE	0.003 *(0.91)*	–0.019 *(0.48)*	–0.067 *(0.01)*	–0.067 *(0.01)*	1.000		
VC–SIZE	–0.083 *(0.01)*	–0.049 *(0.07)*	–0.114 *(0.00)*	–0.110 *(0.00)*	0.107 *(0.00)*	1.000	
STAGE	0.067 *(0.02)*	–0.069 *(0.01)*	0.032 *(0.26)*	–0.108 *(0.00)*	0.053 *(0.06)*	0.092 *(0.01)*	1.000

Table 6(b): The effect of legal systems on investor characteristics

This table reports results from probit and ordinary least squares regressions where the dependent variable are INDEPENDENTVC, VC–AGE, AND VC–SIZE. For each variable, columns *(i)* through *(iii)* report the estimated coefficients for models where the main independent variable is COMMON–ORIGIN, RULE–OF–LAW, and PROCEDURAL–SIMPLICITY, respectively. Each regression employs (unreported) deal controls (STAGE and INDUSTRY). Variables are defined in Table 2. 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 ***, **, *.

	INDEPENDENT-VC			VC-SIZE			VC-AGE		
	(i)	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*
Common-Origin	0.961***			–155.889			0.262		
	(2.91)			*(–1.52)*			*(0.02)*		
Rule-of-law		0.966**			–118.713			–17.897	
		(2.35)			*(–0.53)*			*(–0.62)*	
Procedural-simplicity			0.022**			–4.528			–0.504
			(2.35)			*(–0.80)*			*(–0.76)*
Deal Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	*1,259*	*1,259*	*1,253*	*1,249*	*1,249*	*1,243*	*1,259*	*1,159*	*1,253*
$\chi^2(orF)$	*20,87*	*19.27*	*18.95*	*1.42*	*1.51*	*1.32*	*2.20*	*1.96*	*2.15*
Model p–value	*0.076*	*0.115*	*0.125*	*0.161*	*0.125*	*0.212*	*0.014*	*0.030*	*0.016*
Pseudo R^2	*0.072*	*0.072*	*0.081*	*0.064*	*0.060*	*0.069*	*0.046*	*0.050*	*0.055*

Table 7: Model with investor home effects

This table reports results from (ordered) probit regressions for our model with investor home effects. The dependent variables are INTERACTION, DOWNSIDE, and BOARD CONTROL. For each independent variable, column *(i)* reports the estimated coefficients for a model with company effects and investor home effects only; column *(ii)* reports the estimated coefficients for a model with other investor and deal controls. Panel A reports results for legal origin. The main independent variables are COMPANY–COMMON, INVESTOR–COMMON and INVESTOR–CIVIL. Panel B reports results for rule of law. The main independent variables are COMPANY–RULE, BETTER–INVESTOR–RULE, and WORSE–INVESTOR–RULE. Panel C reports results for procedural simplicity. The main independent variables are COMPANY–PROCEDURAL, BETTER–INVESTOR–PROCEDURAL, and WORSE–INVESTOR–PROCEDURAL. Investor controls are INDEPENDENTVC, VC–AGE, AND VC–SIZE. Deal Controls (unreported) are STAGE and INDUSTRY. Variables are defined in Table 2. 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: Legal origin

	INTERACTION		DOWNSIDE		BOARD CONTROL	
	(i)	*(ii)*	*(i)*	*(ii)*	*(i)*	*(ii)*
Company–Common	0.530**	0.410*	1.118***	0.994***	0.594	0.519
	(2.26)	*(1.92)*	*(4.65)*	*(3.92)*	*(1.55)*	*(1.29)*
Investor–Common	0.738**	0.512	0.807*	0.792**	1.127***	0.830*
	(2.14)	*(1.60)*	*(1.82)*	*(2.19)*	*(2.26)*	*(1.74)*
Investor–Civil	–0.578	–0.414	–0.758**	–0.823**	–1.321***	–1.289***
	(–1.55)	*(–1.17)*	*(–2.14)*	*(–2.22)*	*(–2.87)*	*(–2.62)*
IndependentVC		0.649***		0.564**		0.033
		(2.93)		*(2.20)*		*(0.10)*
VC–Age		–0.005***		0.003*		–0.007***
		(–3.82)		*(1.64)*		*(–2.92)*
VC–Size		–0.001		0.001		–0.001*
		(–0.91)		*(0.33)*		*(–1.95)*
Deal Controls	No	Yes	No	Yes	No	Yes
Observations	*1,259*	*1,105*	*1,401*	*1,233*	*1,272*	*1,123*
χ^2	*6.28*	*59.92*	*23.98*	*55.74*	*14.54*	*56.11*
Model p–value	*0.099*	*0.000*	*0.001*	*0.001*	*0.002*	*0.000*
Pseudo R^2	*0.016*	*0.123*	*0.066*	*0.126*	*0.038*	*0.164*

Panel B: Rule of Law

	INTERACTION		DOWNSIDE		BOARD CONTROL	
	(i)	*(ii)*	*(i)*	*(ii)*	*(i)*	*(ii)*
Company–Rule	1.150***	0.956***	0.847**	0.713**	0.830*	0.756*
	(4.00)	*(3.26)*	*(2.32)*	*(2.26)*	*(1.92)*	*(1.76)*
Better-Investor–Rule	1.498***	0.969*	2.106***	1.330**	0.388	0.142
	(3.05)	*(1.74)*	*(3.38)*	*(2.16)*	*(0.59)*	*(0.18)*
Worse-Investor–Rule	–1.694**	–1.398***	0.132	–0.235	–1.553***	–1.073**
	(–2.52)	*(–3.11)*	*(0.19)*	*(–0.55)*	*(–2.60)*	*(–2.30)*
IndependentVC		0.568***		0.573**		0.005
		(2.78)		*(2.13)*		*(0.02)*
VC–Age		–0.005***		0.003*		–0.006***
		(–4.32)		*(1.67)*		*(–2.70)*
VC–Size		–0.001*		–0.001		–0.001
		(–1.69)		*(–0.18)*		*(–1.62)*
Deal Controls	No	Yes	No	Yes	No	Yes
Observations	*1,259*	*1,105*	*1,401*	*1,233*	*1,272*	*1,123*
χ^2	*18.34*	*113.39*	*14.88*	*58.68*	*6.80*	*46.80*
Model p–value	*0.001*	*0.001*	*0.002*	*0.000*	*0.079*	*0.000*
Pseudo R^2	*0.064*	*0.150*	*0.049*	*0.102*	*0.044*	*0.164*

Panel C: Procedural simplicity

	BOARD CONTROL		INTERACTION		DOWNSIDE	
	(i)	*(ii)*	*(i)*	*(ii)*	*(i)*	*(ii)*
Company–Procedural	0.021**	0.019**	0.030***	0.027***	0.020**	0.020***
	(2.16)	*(2.02)*	*(4.51)*	*(4.21)*	*(2.13)*	*(2.76)*
Better-Investor–Procedural	0.019	0.015	0.045***	0.032*	0.041***	0.030***
	(1.33)	*(1.02)*	*(3.51)*	*(2.59)*	*(3.00)*	*(2.75)*
Worse-Investor–Procedural	–0.042***	–0.034**	–0.048***	–0.043***	–0.002	–0.014
	(–2.88)	*(–2.07)*	*(–4.99)*	*(–3.82)*	*(–0.09)*	*(–1.29)*
IndependentVC		–0.034		0.572***		0.528**
		(–0.10)		*(3.00)*		*(2.07)*
VC–Age		–0.006***		0.004***		–0.004*
		(–2.63)		*(3.95)*		*(–1.93)*
VC–Size		–0.001		0.001		–0.001
		(–1.57)		*(0.58)*		*(–0.30)*
Deal Controls	No	Yes	No		No	Yes
Observations	*1,263*	*1,114*	*1,249*	*1,095*	*1,391*	*1,223*
χ^2	*8.96*	*48.63*	*33.08*	*135.40*	*11.33*	*59.62*
Model p–value	*0.030*	*0.000*	*0.001*	*0.000*	*0.010*	*0.000*
Pseudo R^2	*0.062*	*0.171*	*0.097*	*0.176*	*0.059*	*0.126*

Table 8: Within-civil-law countries analysis

This table reports results from (ordered) probit regressions for our model with investor home effects using only observations from civil law countries. The dependent variables are INTERACTION, DOWNSIDE, and BOARD CONTROL. For each independent variable, column *(i)* reports the estimated coefficients for a model without investor or deal controls; column *(ii)* reports the estimated coefficients for a model with investor and deal controls; column *(iii)* reports the estimated coefficients for a model with investor home effects as well as other investor and deal controls. Panel A reports results for legal origin. The main independent variables are COMPANY–FRENCH, COMPANY–GERMAN, INVESTOR–FRENCH, and INVESTOR–GERMAN. Panel B reports results for rule of law. The main independent variables are COMPANY–RULE, BETTER–INVESTOR–RULE, and WORSE–INVESTOR–RULE. Panel C reports results for procedural simplicity. The main independent variables are COMPANY–PROCEDURAL, BETTER–INVESTOR–PROCEDURAL, and WORSE–INVESTOR–PROCEDURAL. Investor controls are INDEPENDENTVC, VC–AGE, AND VC–SIZE. Deal Controls (unreported) are STAGE and INDUSTRY. Variables are defined in Table 2. 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: Legal origin

	INTERACTION			DOWNSIDE			BOARD CONTROL		
	(i)	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*
Company–French	–0.744***	–0.566**	–0.652**	–0.469	–0.561**	–0.531*	–0.460	–0.535	–0.599
	(–2.74)	*(–2.04)*	*(–2.24)*	*(–1.58)*	*(–1.99)*	*(–1.85)*	*(–1.07)*	*(–1.24)*	*(–1.36)*
Company–German	–0.103	–0.162	–0.178	–0.506*	–0.638**	–0.628**	0.064	–0.070	–0.110
	(–0.35)	*(0.54)*	*(–0.57)*	*(–1.72)*	*(–2.09)*	*(2.00)*	*(0.14)*	*(–0.15)*	*(–0.23)*
Investor–French			–0.843**			0.369			–0.847**
			(–2.22)			*(0.96)*			*(–2.02)*
Investor–German			–1.195			0.672			–1.036
			(–1.49)			*(1.03)*			*(–1.24)*
IndependentVC		0.564**	0.599***		0.673**	0.658**		0.013	0.025
		(2.41)	*(2.61)*		*(2.49)*	*(2.42)*		*(0.04)*	*(0.07)*
VC–Age		–0.004***	–0.004***		0.004*	0.003*		–0.007***	–0.007***
		(–3.38)	*(–3.21)*		*(1.95)*	*(1.89)*		*(–2.71)*	*(–2.67)*
VC–Size		–0.001	–0.001		0.001	0.001		–0.001	–0.001
		(–0.66)	*(–0.47)*		*(0.64)*	*(0.61)*		*(–1.17)*	*(–1.17)*
Deal Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	*1,002*	*889*	*889*	*1,139*	*1,013*	*1,013*	*1,027*	*917*	917
χ^2	*11.99*	69.04	*91.32*	*3.51*	*36.21*	*62.99*	*2.53*	*51.34*	*56.10*
Model p–value	*0.003*	*0.001*	*0.000*	*0.173*	*0.004*	*0.001*	*0.283*	*0.000*	*0.000*
Pseudo R^2	*0.041*	*0.129*	*0.141*	*0.019*	*0.114*	*0.118*	*0.028*	*0.202*	*0.209*

Panel B: Rule of Law

	INTERACTION			DOWNSIDE			BOARD CONTROL		
	(i)	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*
Company–Rule	0.880***	0.779***	0.952***	0.503	0.349	0.368	0.549	0.569	0.601
	(*3.48*)	(*2.68*)	(*3.04*)	(*1.60*)	(*1.29*)	(*1.24*)	(*1.37*)	(*1.26*)	(*1.26*)
Better-Investor–Rule			0.901			1.202			0.065
			(*1.44*)			(*1.41*)			(*0.06*)
Worse-Investor–Rule			–1.394***			0.121			–0.546
			(*–2.27*)			(*0.27*)			(*–1.06*)
IndependentVC		0.532**	0.518**		0.613**	0.596**		–0.031	–0.033
		(*0.66*)	(*2.34*)		(*2.18*)	(*2.11*)		(*–0.08*)	(*–0.09*)
VC–Age		–0.005***	–0.004***		0.003**	0.003*		–0.007***	–0.007***
		(*–4.27*)	(*–4.18*)		(*1.76*)	(*1.73*)		(*–2.71*)	(*–2.66*)
VC–Size		–0.001	–0.001*		0.001	0.001		–0.001	–0.001*
		(*–1.19*)	(*–1.66*)		(*0.54*)	(*0.41*)		(*–1.21*)	(*–1.21*)
Deal Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	*1,002*	*889*	*889*	*1,139*	*1,013*	*1,013*	*1,027*	*917*	*917*
χ^2	*12.12*	*98.57*	*111.15*	*2.57*	*37.46*	*48.56*	*1.89*	*45.69*	*49.58*
Model p–value	*0.001*	*0.001*	*0.000*	*0.109*	*0.002*	*0.000*	*0.170*	*0.001*	*0.000*
Pseudo R^2	*0.036*	*0.135*	*0.147*	*0.015*	*0.069*	*0.100*	*0.018*	*0.195*	*0.197*

Panel C: Procedural simplicity

	INTERACTION			DOWNSIDE			BOARD CONTROL		
	(i)	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*	*(i)*	*(ii)*	*(iii)*
Company–Procedural	0.026***	0.026***	0.032***	0.009	0.010	0.011	0.015	0.016	0.017
	(3.79)	(*3.46)*	*(4.07)*	*(0.92)*	*(1.20)*	*(1.28)*	*(1.40)*	(1.46)	*(1.45)*
Better-Investor–Procedural			0.047***			0.035**			–0.011
			(3.77)			*(1.96)*			*(–0.45)*
Worse-Investor–Procedural			–0.053***			–0.004			–0.024
			(–3.59)			*(–0.31)*			*(–1.26)*
IndependentVC		0.554***	0.575***		0.613**	0.586**		–0.012	–0.020
		(2.67)	*(2.78)*		*(2.22)*	*(2.12)*		*(–0.03)*	*(–0.05)*
VC–Age		–0.005***	–0.004***		0.003**	0.004**		–0.007***	–0.007**
		(–4.55)	*(–3.87)*		*(1.86)*	*(1.96)*		*(–2.61)*	*(–2.48)*
VC–Size		–0.001	–0.001		0.001	0.001		–0.001	–0.001
		(–0.61)	*(–0.64)*		*(0.67)*	*(0.67)*		*(–1.17)*	*(–1.17)*
Deal Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	*996*	*883*	*879*	*1,133*	*1,007*	*1,003*	*1,022*	*912*	*908*
χ^2	*14.35*	*121.31*	*143.86*	*0.85*	*36.94*	*48.16*	*1.97*	*44.11*	*43.54*
Model p–value	*0.001*	*0.001*	*0.000*	*0.356*	*0.002*	*0.000*	*0.160*	*0.001*	*0.001*
Pseudo R^2	*0.050*	*0.153*	*0.180*	*0.008*	*0.101*	*0.108*	*0.022*	*0.196*	*0.197*

Table 9: Model with international investor effects

This table reports results from (ordered) probit regressions for our model with international investors effects. The dependent variables are INTERACTION, DOWNSIDE, and BOARD CONTROL. Panel A reports results for legal origin. The main independent variables are COMPANY–COMMON, INTERNATIONALVC, INVESTOR–COMMON, and INVESTOR–CIVIL. Panel B reports results for rule of law. The main independent variables are COMPANY–RULE, INTERNATIONALVC,BETTER- INVESTOR–RULE, and WORSE-INVESTOR–RULE. Panel C reports results for procedural simplicity. The main independent variables are COMPANY–PROCEDURAL, , INTERNATIONALVC, BETTER-INVESTOR–PROCEDURAL, and WORSE-INVESTOR–PROCEDURAL. VC controls (unreported) are VC–INDEPENDENT, VC–AGE, AND VC–SIZE. Deal Controls (unreported) are STAGE and INDUSTRY. Variables are defined in Table 2. 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: Legal origin

	INTERACTION	DOWNSIDE	BOARD CONTROL
Company–Common	0.434**	1.100***	0.501
	(2.10)	*(4.26)*	*(1.24)*
InternationalVC	0.356	1.318***	–0.637
	(0.78)	*(3.13)*	*(–1.28)*
Investor–Common	0.344	0.230	1.111**
	(0.88)	*(0.52)*	*(2.24)*
Investor–Civil	–0.552**	–1.389***	–1.025**
	(–1.91)	*(0.72)*	*(–2.10)*
VC Controls	Yes	Yes	Yes
Deal Controls	Yes	Yes	Yes
Observations	*1,105*	*1,233*	*1,123*
χ^2	*62.70*	*94.57*	*57.53*
Model p–value	*0.001*	*0.000*	*0.000*
Pseudo R^2	*0.125*	*0.156*	*0.170*

Panel B: Rule of Law

	INTERACTION	DOWNSIDE	BOARD CONTROL
Company–Rule	0.933***	0.618*	0.807**
	(3.29)	*(1.95)*	*(1.87)*
InternationalVC	0.241	0.960**	–0.611
	(0.52)	*(2.26)*	*(–1.41)*
Better-Investor–rule	0.777	0.551	0.717
	(1.45)	*(0.94)*	*(0.94)*
Worse-Investor–rule	–1.482***	–0.595	–0.765**
	(–3.16)	*(–1.55)*	*(–1.78)*
VC Controls	Yes	Yes	Yes
Deal Controls	Yes	Yes	Yes
Observations	*1,105*	*1,233*	*1,123*
χ^2	*115.67*	*67.95*	*50.67*
Model p–value	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.151*	*0.119*	*0.170*

Panel C: Procedural Simplicity

	INTERACTION	DOWNSIDE	BOARD CONTROL
Company–Procedural	0.026***	0.019**	0.021**
	(4.20)	*(2.46)*	*(2.21)*
InternationalVC	0.008	0.794*	–0.943*
	(0.02)	*(1.95)*	*(–1.78)*
Better-Investor–procedural	0.031**	0.017	0.031**
	(2.31)	*(1.50)*	*(1.99)*
Worse-Investor–procedural	–0.043***	–0.020*	–0.025*
	(–4.01)	*(–1.95)*	*(–1.89)*
VC Controls	Yes	Yes	Yes
Deal Controls	Yes	Yes	Yes
Observations	*1,095*	*1,223*	*1,114*
χ^2	*136.23*	*70.62*	*52.50*
Model p–value	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.176*	*0.136*	*0.184*