Advice and monitoring in venture finance

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ADVICE AND MONITORING IN VENTURE FINANCE

Abstract

This paper studies the advising and monitoring activities of 14 European venture capitalists (VCs) in 74 entrepreneurial firms. We distinguish between VC advising versus monitoring activities based on the congruence versus dissonance with entrepreneurial interests. The data indicate that the allocation of greater cash flow and control rights to the VCs gives rise to more intensive VC advice, but not more intensive monitoring. VC monitoring is attributable to the need for monitoring due to entrepreneurial firm-specific characteristics. The data further indicate a strong effect of portfolio size on both advice and monitoring, consistent with recent theoretical work on the optimal size of VC portfolios. Finally, the data indicate a country's legality index is closely connected with the propensity for conflicts between entrepreneurs and their investors. The results are robust to the potential for endogeneity, among various other robustness checks.

Keywords: Venture Capital, Monitoring, Advice

JEL Classification: G24, G28, G31, G32

1. Introduction

Since the seminal work of Jensen and Meckling (1976), theoretical research in corporate finance typically uses effort, advising and/or monitoring activities as a mechanism in which to derive testable implications. These activities, however, have received comparatively less empirical attention in the corporate finance literature. This paper investigates these activities within the context of venture finance. It is widely recognized that venture finance is characterized by problems of information asymmetry, illiquidity and non-diversification, and therefore high risk in terms of both idiosyncratic and market risk. An overriding issue is thus the advising and monitoring role of the investor. In fact, one of the primary explanations for the existence of venture capitalists ("VCs") is the presence of pronounced problems of adverse selection and moral hazard in financing entrepreneurial firms (Kanniainen and Keuschnigg, 2003, 2004; Neus and Walz, 2004; Mayer *et al*., 2004). The VC setting is thus an interesting and important context in which to explore investor advising and monitoring activities, since the advice and monitoring provided is at least as important as the contributed capital.

Value adding by VCs has been analyzed by a number of papers in the recent academic literature such as Gompers and Lerner (1999, 2001), Hege *et al*. (2003), Kortum and Lerner (2000), Kanniainen and Keuschnigg (2003), Keuschnigg (2004). Overall, the evidence suggests that the activities fulfilled by VCs at small entrepreneurial start-ups can be regarded as of two primary types. First, VCs carry out support activities and thereby increase the value of ventures. The most common support activities are recruiting key personnel, establishing business strategies, or facilitating the going public process. Second, VCs play an important role in controlling and governing entrepreneurial decision-making in order to realize investors' interests. A frequently documented phenomenon is that VCs interfere in decision-making at start-ups and often substitute the founder entrepreneur with a professional manager. Most papers in the empirical literature have considered only one of the two activities in isolation.[1]

In this paper, we examine the determinants of VCs' involvement in entrepreneurial firms along both of the two effort dimensions, which we will further refer to as "advice" and "monitoring", respectively. Our analysis builds on prior work, and is unique in that we directly measure effort exertion on advice and monitoring based on the premise that advice is congruent while monitoring is dissonant with respect to entrepreneurial interests. In other words, advice is equivalent to the provision of effort or expertise by the investor that contributes to the value of the venture. Monitoring, by contrast, refers to the investor's effort to govern and, if necessary, interfere into the entrepreneur's activity. Said differently, advice refers to the VCs direct contribution to the value of the venture in terms of effort or expertise, while monitoring refers to investor-entrepreneur disagreements. The need for the latter typically arises as a consequence of asymmetric information between the two parties. On the contrary, the first is required

[1]A few exceptions include Gompers and Lerner (1999), Hege *et al*. (2003), and Hsu (2004). The differences between our paper and others in the literature are discussed in detail in section 2.

from the VC in most projects independent of the extent of entrepreneurial moral hazard. We provide new and rich empirical details from European VC funds that explain these two activities.

The empirical analysis in this paper takes three different types of empirical effort measures into account. First, we examine total effort exertion by investors proxied by the average number of hours per month spent with an entrepreneurial firm. We then disentangle this investor commitment to the entrepreneurial firm by exploring the VC's contribution in terms of advice and monitoring. Our advice measure is built on the average ranking by the VC of the importance of his contribution in a number of different fields of activities. In turn, we proxy monitoring by the number of conflicts between the VC and the entrepreneur: the more intense the monitoring activity, the higher the number of disagreements between the two parties.

The analysis is based on a hand-collected sample of 121 investment rounds in 74 entrepreneurial firms by 14 European VC funds. We test predictions from theories of VC financing that may shed light on effort exertion by VCs. In particular, we test whether the use of convertible securities allows for an efficient allocation of incentives between the contracting parties and thereby enhances the VC's contribution in terms of advice, which is a conjecture based on variations of the theory of bilateral moral hazard; see Bergemann and Hege (1998), Casamatta (2003), Repullo and Suarez (2004), and Schmidt (2003). Emphasizing the role of equity ownership in incentivizing the investor's advising activity, these theories also suggest that large VC ownership percentages would increase the VC's advice. Convertible securities may also help to implement optimal monitoring mechanisms by mitigating entrepreneurial signal manipulation (Cornelli and Yosha, 2003). As a consequence, the use of convertible securities may facilitate intense monitoring and a large number of disagreements between the VC and the entrepreneur.

Other theories predict that it is rather the control allocation than the financial structure that matters for the provision of incentives for VCs. Chan, Siegel and Thakor (1990) claim that VCs require substantial control rights because the entrepreneur's skill level is unknown at the time of contracting. Control rights can allow the VC to replace the original manager as CEO if the original manager turns out to be insufficiently skilled. The implication is that the more uncertainty is involved in a venture, the more control is allocated to the VC and therefore the higher his effort will be to engage in searching for new outside managers. Kirilenko (2001) similarly suggests that the control allocation at an early stage is a function of the uncertainty involved in the venture. If riskier projects require more effort, the provision of control to the VC should exacerbate his contribution in terms of advice and monitoring.[2] Our empirics control for both the riskiness of the project and the risk associated with the entrepreneur.

Our results indicate that the allocation of cash-flow and especially control rights matters, even if we account for the fact that specific terms of the contracting transaction may be endogenous with respect to effort exertion by VCs. In other words, the allocation of board and veto rights and the type of security

[2] Several theories outside the VC context also suggest that investors' control rights enhance interference. The most well-known examples are Aghion and Bolton (1992) and Burkart, Gromb and Panunzi (1997).

chosen to finance a transaction will depend on the VC's appraisal of the need for advising and monitoring a particular entrepreneurial project. Most of the evidence provided herein is robust to such concerns.[3]

Our results are generally consistent with the view that the allocation of greater cash flow and control rights to the VCs gives rise to more intensive VC advice, but not more intensive monitoring. Monitoring intensity, by contrast, is more closely connected with entrepreneurial firm-specific characteristics, such as entrepreneur experience and entrepreneurial firm stage of development at time of investment. Monitoring intensity is not *caused* by contractual allocation of control; rather, it is driven by the characteristics of the entrepreneur and as such the need for monitoring.

In particular, we find support for control theories such as Chan, Siegel and Thakor (1990) and Kirilenko (2001). Even after accounting for the endogeneity of control allocation, we find that veto rights significantly increase the VCs' advising activity. VCs with full veto control with respect to the five categories considered,[4] give roughly 30% more advice than VCs who have no veto rights in any of these matters. Other proxies for control such as board rights or the use of special contractual terms (such as antidilution rights, information rights, or IPO registration rights) seem to be irrelevant. These results indicate that VC veto rights are an extremely important and effective mechanism for VCs to exercise their views on how to bring the project to fruition, and more effective than information rights and other specific contractual terms. Put another way, veto rights are "high powered" mechanisms but other control rights provide "low powered" incentives for the VC to provide advice, because veto rights provide the VC with unique mechanisms relative to the standard menu of contractual control terms.

Moreover, the evidence supports theories predicting the importance of financial structure in the provision of incentives: we find a positive correlation between the VCs' effort on advice and the use of convertible securities. In particular, VCs using convertible debt or preferred equity provide on average 10% more advice. We argue that the allocation of cash-flows and financial structure depend on factors like the parties' bargaining position and experience, or entrepreneurial capital constraints, rather than the VC's assessment of the project's need for advice. Thus cash-flow rights are less prone to endogeneity problems with respect to effort exertion by VCs, an argument supported by VC financing theories and empirical evidence. To the extent that security choice is exogenous to effort, the use of convertible securities enhances advice. The finding is however not robust to the endogeneity of the financial structure. A related result is that VCs with higher ownership percentages spend significantly more time with their entrepreneurs, which is consistent with the role of equity ownership in the provision of incentives. Note, however, that financial structure and ownership share seem to be irrelevant for the extent of monitoring (disagreement between the VC and entrepreneur). Thus the results seem to give more support to the bilateral moral hazard models like Casamatta (2003), Neus and Walz (2004), Bascha and Walz (2001a), Repullo and Suarez (2004) and Schmidt (2003), than to the theories predicting the role of financial structure in disciplining entrepreneurs like Cornelli and Yosha (2003).

[3] Particular reasons for endogeneity are discussed in detail in Section 2.
[4] These categories include asset sales, asset purchases, changes in control, issuance of equity, and other decisions.

Further, consistent with empirical studies by Gompers (1995), Sapienza Manigart and Vermeir (1996), and Kaplan and Strömberg (2003), we find that the risk involved in an investment is an important determinant of the investor's value adding involvement. When VCs consider a project to be 10% riskier, they provide on average 25% more advice. Moreover, early stage firms that represent greater uncertainty receive more attention from VCs along all effort dimensions: VCs spend on average 8-10 hours more with their early stage ventures and provide them roughly 10% more advice. They also have on average 1 or 2 more different types of disagreements with entrepreneurs at their early stage investments. Contrary to our expectations, projects in the Internet industry are monitored and advised less extensively. The latter result indicates that the lack of special industry expertise may mitigate the VC's involvement in high-tech ventures.

We also find that VCs contribute more when their syndicating partners work more hours, which refers to complementarities in effort exertion between syndicate members. If syndicate members provide one hour more every month, the VC manager will also spend about an hour more with the entrepreneur. Other empirical studies on syndication are consistent with this finding (Lerner, 1994). A related result in this paper is that VCs give more advice to and disagree less with more experienced entrepreneurs. This implies that VCs and entrepreneurs tend to have complementary skills or expertise, which is consistent with the way several researchers model VC financing in a bilateral moral hazard setting.[5] Our evidence also indicates that VCs that have more investments per number of managers tend to contribute less, as expected (Kanniainen and Keuschnigg, 2003, 2004; Keuschnigg, 2004; Cumming, 2004). In our sample, VCs with one extra entrepreneurial firm per manager in their portfolio provided on average 2-3 hours per month of less support, 20% less advice, and had 0.2 to 0.3 fewer disagreements with entrepreneurs. These findings support the conjecture that there exists an optimal number of investments that VC fund managers should include in their portfolio. Last, we find a positive relationship between VCs' involvement and successful exits but the direction of causality in this context is highly ambiguous.

The paper is organized as follows. Section 2 describes the related literature, outlines our hypotheses and methodology. The data are described in section 3. The core empirical results together with robustness checks are detailed in section 4. Section 5 discusses limitations and alternatives for future research. The summary and conclusion follows in section 6.

2. Related Research and Hypotheses

2.1 Related Empirical Results and Methodology

This research relates to a number of empirical papers focusing on investors' involvement in the development of entrepreneurial firms. Gorman and Sahlman (1989) point out the role of VCs in strategic analysis, management recruiting, and CEO replacements. Gompers (1995) finds that VCs become more

[5] The VC and the entrepreneur are assumed to exert complementary efforts in Casamatta (2003), Cestone (2001), Repullo and Suarez (2004).

active when the risk and growth options involved in their investments are high. Sapienza (1992) shows that it is the highly innovative entrepreneurs that benefit most from value added by VCs. Finally, Barry *et al*. (1990) and Megginson and Weiss (1991) document the certification role of VCs in the going-public process and report that firms financed by VCs tend to have less underpricing at IPOs (although see Francis and Hasan, 2001, for more recent work).

Sapienza *et al.* (1996) measure effort on advice in two dimensions. They consider VCs' rankings of the importance and effectiveness of their contribution. Their measure of advice comes from multiplying the rate of importance with the rate of effectiveness.[6] We employ similar methodology: we ask VCs to rank the importance of their contribution to the venture in a number of different fields of activities on a scale of 1-10. Our measure for advice is the average of these rankings.[7] Although this measure is subject to the VCs' own performance evaluation, it is indicative that in most advising activities considered VCs reported a significantly higher number of monthly hours for ventures for which they gave higher advice rankings.

Sapienza *et al.* (1996) further examine VC governance in terms of the frequency of face-to-face interactions the VC has with the venture CEO and the number of working hours devoted to the venture. Our proxy for monitoring is different. We do not distinguish between advice and monitoring on the basis of the time spent with the entrepreneurial firm or the frequency of interactions. We aim at capturing the difference between the two activities by arguing that monitoring is dissonant (while advice is congruent) with entrepreneurial interests. Thus, in our approach the number of hours is a proxy for total effort exerted by the investor, while the measure for monitoring is based on the number of different types of disagreements with the entrepreneur. We ask VCs to report whether they had disagreements with the entrepreneurial firm concerning different matters including strategy, marketing, financial matters, R&D, human resources, and product development.[8] Our proxy for monitoring is the sum of these disagreement dummies. This measure is based on the following presumption: intensive monitoring increases the possibility for the VC to discover entrepreneurial shirking and thus gives rise to a higher number of conflicts between the two parties. Sapienza *et al.* (1996) consider the determinants of advice and governance by examining agency risk (represented by CEO experience), and other project and environment related uncertainty (business risk ranking, the firm's stage of development, and the innovativeness of the project). Although they find no evidence for more intense advice or governance at ventures with less CEO experience, they find that project and environment related uncertainty matters: VCs become more involved in early stage ventures and in projects with higher risk assessment.

[6] In Sapienza *et al.* (1996), the rate of importance of the VC's contribution is ranked on a scale of 1-5 (1=not important at all, 5=of great importance), while the effectiveness ranking is on a scale of 1-10 (1=not effective at all, and 10=extremely effective). The measure for advice comes from multiplying the importance and the effectiveness ranking.
[7] The average ranking of the importance of the VCs' contribution in terms of advice in each field considered is presented in Table 2, Panel B.
[8] The total number of disagreements between entrepreneurs and VCs in our sample, in each field considered, is presented in Table 2, Panel B.

Similar to Sapienza *et al.* (1996), Kaplan and Strömberg (2003) consider a more complete classification of risk factors involved in the financing of entrepreneurial ventures. Based on an analysis of VCs' investment memoranda, they identify three different types of risk measures: "internal risk" which is a consequence of asymmetric information between the parties; "external risk", which refers to environment related uncertainty, and "project complexity" risk, which arises from the difficulty and complexity of project realization. They find that at ventures with high internal and external risk VCs tend to have significantly more control rights, in the form of board control. Board control enhances monitoring by the VC but has no impact on advice. At the same time, VCs' equity ownership induces advice but does not affect the extent of monitoring. Monitoring in their paper is measured by the VC's involvement in all aspects of human resource policies. We believe that many of these activities are "entrepreneur friendly" thus belong to the category of advice, and confirmed this interpretation directly with the VCs that provided the data used in this paper. Moreover, the advice and monitoring measures in Kaplan and Stromberg (2003) are binary, unlike our data which comprise more variation in the dependent variables (among other things described below).

2.2 Theoretical Models and Hypotheses

Our hypotheses concerning the determinants of effort exertion by venture investors are based on a number of theories modeling the investor's involvement in the entrepreneurial firm through exerting advising and /or monitoring activities. These theories focus on three specific issues: (1) whether the cash-flow allocation has a role in implementing optimal incentive schemes for the entrepreneur and the VC, (2) whether the allocation of control rights provides implicit incentives for the VC to interfere in entrepreneurial decision-making, and (3) whether syndication affects the involvement of VCs. Below, we briefly discuss the most important theories addressing these issues and their empirical implications.

2.2.1. Allocation of Cash-flow Rights

A number of papers considered VC financing in a bilateral moral hazard setting, in which both an entrepreneur and an investor are supposed to exert effort to increase the probability of successful outcome. Since effort exertion requires the provision of high-powered incentives for both parties the VC setting implies an inherent conflict of incentives which, unlike the classical problem of entrepreneurial moral hazard, can not be solved by rendering the entrepreneur residual claimant of the firm's profits and providing the investor a debt claim.[9] The need for advice requires that in case of success the VC holds an equity-like claim: a convertible security or pure equity. In a setting of staged VC financing, Repullo and Suarez (2004) show that optimal incentive provision for a second, effort exertion stage requires that the VC receives no compensation for his initial stage investment in the form of a share in the firm's profits. All equity is needed to incentivize the parties to exert effort in the subsequent period. Such a contractual arrangement can be implemented by using convertible debt or preferred equity. Casamatta (2003) also

[9] Under the assumption of entrepreneurial moral hazard, when only the entrepreneur needs to be given high-powered incentives to exert effort, debt contracts have been shown to be optimal.

considers the bilateral moral hazard setting and argues that it is the party with smaller financial participation that needs to be provided higher powered incentives in the form of a riskier claim. Thus in projects which require large outside financing, the entrepreneur will typically hold pure equity while the VC will have a less risky, convertible claim. This is because financial participation (ownership) in the project inherently increases incentives to exert effort: to provide sufficient effort, the party contributing a smaller part to the investment outlay needs to be given a higher share in the success state residual claim. Schmidt (2003) considers bilateral moral hazard in a sequential setting and shows that a convertible security implements optimal investment in effort by both parties by allowing private and social incentives to invest coincide, given an appropriately chosen conversion rate. In an initial period, the entrepreneur exerts effort optimally since the entrepreneur holds all the equity in the company, while the VC has a debt-like claim. After optimal effort is chosen by the entrepreneur, the VC converts his debt into equity and becomes residual claimant for the firm's profits which allows him to invest optimally in the second stage. Overall, these theories give rise to the following hypothesis:

Hypothesis 1a: When convertible securities are used VCs contribute more to the value of entrepreneurial firms, and in particular provide more advice. Moreover, VCs with large (equity) ownership also exert more effort on advice.

Convertible securities have also been shown to elicit truthful information revelation and thereby mitigate problems arising from asymmetric information between VCs and entrepreneurs. Cornelli and Yosha (2003) argue that when stage financing is used entrepreneurs may engage in signal manipulation in order to induce the VC to finance a subsequent project stage. They show that the use of convertible securities alleviates this problem, because the provision of good signals calls for the conversion of the VC's debt into equity which reduces the entrepreneur's share in profits. Thus convertible securities may be used in VC financing to discipline the entrepreneur's activity. We conjecture the following hypothesis.

Hypothesis 1b: Convertible securities mitigate the extent of investor-entrepreneur conflicts. The impact of the VC's ownership share on disagreements is ambiguous.

To test Hypotheses 1a and 1b, we use a convertible security dummy variable for investments financed by convertible debt or preferred equity. To consider the impact of equity holdings, we include the percentage of the VC's ownership share in the firm (in the best case scenario) as an explanatory variable.[10]

2.2.2. Allocation of Control Rights

Other theories predict that VCs are provided incentives primarily via control rather than cash-flow rights. Chan, Siegel and Thakor (1990) and Kirilenko (2001) claim that VCs require substantial control rights because of the uncertainty concerning future prospects, especially the skills of the founder

[10] A more detailed definition of each dependent and independent variable used in the analysis is presented in Appendix 2.

entrepreneur to manage the newly set up company. Control rights provide the VC incentives to engage in executive search so that he is able to substitute the original manager once the manager turns out to be insufficiently skilled. Therefore the more uncertainty is involved in a venture, the more control is allocated to the VC, and the more intense his effort exertion. In Chan *et al.* (1990) and Kirilenko (2001), there is no information asymmetry between the parties: both the VC and the starter entrepreneur are uninformed of the latter's skills in managing the company. To this extent, uncertainty refers not only to the entrepreneur's skill level but also to project and environment related risk. Kirilenko (2001) relaxes the assumption of symmetric information in a very general setting and suggests that the control allocation at an early stage is a function of the information asymmetry between the two parties. Higher degree of information asymmetry related to project quality or entrepreneurial skill level requires that in equilibrium more control is allocated to the VC. Overall, these theories imply the following hypotheses.

Hypothesis 2: Riskier projects require more intense effort exertion by the VC along both effort dimensions.

Hypothesis 3: Since riskier projects require more effort, the provision of control to the VC should exacerbate his contribution in terms of advice and monitoring.

To test Hypothesis 2, we use several risk variables that capture the different project and environment related uncertainty inherent in an investment. The most important are the VC's ranking of the "entrepreneur's experience" and "project risk" on a scale of 1-10. To establish an overall project risk measure, we build on Kaplan and Strömberg (2003).[11] We ask VCs to rank their investments on a scale of 1-10 for a number of risk types such as uncertainty about product/technology, risky competitive position, uncertain customer adoption, etc. We employ an average of these risk factors[12] – excluding the entrepreneur's experience, which is considered separately – in the empirical analysis. Since early stage investments and firms in high-tech industries usually represent greater uncertainty, a stage dummy variable and industry dummies for the biotech, electronics, and Internet investments are also considered as additional proxies for the risk involved. Moreover, since foreign investments may also be riskier for the VC, we include a "foreign investment" dummy and the legality index of the country of investment in the empirical analysis. The legality index accounts for the substantive content of laws pertaining to investing, the quality of their enforcement, and the likelihood that they will need to be enforced. Based on Berkowitz *et al.* (2003), we use a weighted sum of the following factors: civil versus common law

[11] Based on an analysis of VCs' investment memoranda, Kaplan and Strömberg (2003) identify the following risk factors of start-up investments: uncertain market size, uncertainty about product/technology, risky competitive position, uncertain customer adoption, risk in business strategy, quality of entrepreneur's management and business skills, questionable performance to date, contractual structure and downside risk, high valuation, costly to monitor investment, negative influence of other investors, and uncertain financial market and exit conditions.

[12] This is in contrast to Kaplan and Strömberg (2003) who categorize the different risk factors as internal, external and complexity risk. In our sample, these risk distinctions were not statistically or economically significant, and the risk measures were very highly correlated with one another (generally the correlation coefficients are greater than 0.5).

systems, the efficiency of the judicial system, the rule of law, corruption, risk of expropriation, risk of contract repudiation, and shareholder rights.[13] Higher numbers indicate 'better' legal systems.

In testing Hypothesis 3, we use three different proxies to measure the extent of VC control. The variable which we further refer to as "veto rights" is an average of a number of veto right dummy variables such as veto on asset sales or purchases, changes in control, issuance of equity and other decisions. The variable called "board seats" represents the proportion of board seats held by the VC. "Special control rights" refer to an average of dummy variables indicating whether the VC did or did not have certain contractual rights, for example the right to replace the CEO, the right for first refusal in sale, or IPO registration rights.[14]

An important implication follows from Chan *et al.* (1990) and Kirilenko (2001): control allocation is endogenous to the different risk characteristics of the project such as entrepreneurial skill level or environment related uncertainty. Since riskier projects may require more effort, the allocation of control rights may depend on the VC's assessment of the risk characteristics of a particular project and therefore of the need for his contribution in terms of effort. This insight is consistent with Kaplan and Strömberg (2003), in particular, with the finding that VCs obtain more board rights when their projects are characterized by higher project and environment related risk. To this extent, control allocation is endogenous to the need for the VC's involvement. Theories focusing on the allocation of cash-flow rights do not have this implication. The optimality of convertible securities in Casamatta (2003), Bascha and Walz (2001), Repullo and Suarez (2004) and Schmidt (2003) is independent of the riskiness of final period cash-flows. It is not more uncertainty that makes the convertible security optimal in the provision of incentives for VCs and entrepreneurs. Moreover, the findings in Kaplan and Strömberg (2003) show that entrepreneurial cash-flow incentives are not related to project risk. They argue that since entrepreneurs are typically cash constrained, cash-flow rights are allocated not with the objective to satisfy incentives purposes. This suggests that endogeneity problems are less relevant concerning our earlier hypotheses on how security choice may affect effort exertion by VCs. Nevertheless, in the empirical analysis we account for the potential endogeneity of both the control and cash-flow rights variables.

2.2.3. Syndication

Focusing on the involvement of VCs, one has to take into account that most venture investments are syndicated transactions. Three papers are important to mention in this context. In an empirical investigation of the US biotechnology industry, Lerner (1994) finds that older, larger, thus more experienced VCs tend to syndicate with other established venture funds, which refers to complementarities concerning skills of syndicate members. Wright and Lockett (2003) find empirical support for the view that VC syndication facilitates value-added. The theoretical analysis in Casamatta and Haritchabalet (2003) concludes that effort exertion by syndicate members depend on their experience: less experienced

[13] We do not use separate variables for each of these legal factors because they are very highly correlated.
[14] A more detailed definition of each dependent and independent variable used in the analysis is presented in Appendix 2.

VCs will exert too few, while more experienced VCs will provide too much effort to increase the chance for success. These findings give rise to the following hypothesis:

Hypothesis 4: If VCs have sufficient experience, a complementarity of effort exertion will characterize syndicated transactions: VCs work more when their syndicating counterparts also exert higher effort.

To test Hypothesis 4, we consider the impact of the average number of monthly hours provided by syndicating partners on the three measures of VCs' involvement. The above discussion suggests that effort exertion in investment syndicates will depend on the participating VCs' skills and experience. Since VCs that exert more effort may accumulate more experience and thus participate in more efficient syndicates, syndication may be endogenous to effort exertion by VCs, thus the direction of causality requires further scrutiny. The problem is addressed in the empirical analysis in Section 4.

2.3 Control Variables

In the course of testing the above hypotheses, we employ a number of control variables. Some of these variables concern the characteristics of the VC fund. To account for the fact that our sample includes both limited partnership VCs and bank-affiliated funds, we test whether bank-related VCs are inclined to provide less value added than the traditional limited partnership organizations.[15] Moreover, considering the size of the VC fund per number of managers, we test whether the extent of the VC involvement depends on portfolio size, as modeled by Kanniainen and Keuschnigg (2003, 2004), and Keuschnigg (2004). As well, note that since VCs exerting more effort are able to manage larger portfolios, the variable we employ in the analysis (the number of entrepreneurial firms in the portfolio per number of VC managers[16]) may be endogenous to our advising and monitoring measures. We address this issue in the empirical analysis.

Another group of control variables include investment performance characteristics such as dummy variables for successful exits. Since VCs generate most of their profits from a small number of very profitable investments (so called high-flyers or home runs) which often yield more than five times the value of the initial investment, their projects' inherent success potential seems to be important for success. Related evidence is provided by Sahlman (1990): in a sample of 383 investments, about 35% of all projects turned out to be a total failure, 15% were highly profitable, while the remaining 50% were "moderately successful". We presume that VCs exert more effort on their inherently successful projects. We test this assumption by involving dummy variables for successful IPO or acquisition exits. Further, we assume that if VCs exert more effort on a few successful investments, they will exert less effort on their "moderately successful" projects which remain in their portfolio for a long time. In that case, the

[15] In Europe, many VC funds are affiliated with larger financial institutions such as banks. We do not restrict our attention to limited partnerships (the more common VC structure in the US) but control for the type of fund in the empirical analysis.
[16] Controls for the amount of capital in the VC fund per the number of fund managers were too highly correlated with the variable for this measure of portfolio size per manager, and therefore not used. Either way, the other variables are not affected.

length of the investment period, which we proxy with the number of investment months, must be negatively related to their involvement. To the extent that successful exits occur as a consequence of intense monitoring and advising by VCs, concerns for endogeneity naturally arise for this group of variables. The issue is addressed in the subsequent empirical analysis.

Finally, we include the book value of the investment and the number of investment rounds as transaction related control variables. The first is to test whether the involvement of VCs varies according to investment size. The latter accounts for the fact that staging is a monitoring device: investments in several rounds require more intense involvement by VCs, especially in the monitoring task. To the extent that staging happens as a consequence of the VC's ex-ante appraisal of project risk, the number of investment rounds may be endogenous to effort exertion, especially monitoring. Thus in the empirical analysis, we treat the number of rounds as a potential endogenous variable.

3. The Dataset

3.1. Data Collection

The data were obtained by a survey and interview of VC fund members of the European Venture Capital Association (EVCA). In total, there are data on 121 investment rounds in 74 entrepreneurial firms from 14 VC funds in 7 European countries (Belgium, Denmark, Germany, Hungary, Italy, Portugal, The Netherlands). No fund had data on more than 7 investments, and one provided data on just two firms.[17] Thus the results that follow are not uniquely attributable to any given fund in the data.

In Europe, the term "venture capital" is defined more broadly than it is in the U.S. All of the funds in our sample do invest in earlier stages of development, but some funds also finance later stage and buyout investments (which is referred to as "private equity" not "venture capital" in the U.S). Hence, we do not exclude from the sample buyouts or any data on the basis of the stage of development, because the same VC managers in our sample have contemporaneously invested in both early stage projects and buyouts.[18] As such, we use the term "venture capital" in the broad (European) definition of the term. We control for the stage of entrepreneurial firm development at time of first VC investment in the analysis.

3.2. Data Summary

Table 1 defines the variables considered. Table 2 (Panels A, B) provides a reasonably complete characterization of the data. The data are presented by entrepreneurial firm, mainly because we do not observe significant variation across different financing rounds. The first column presents the data for all the entrepreneurial firms in the sample. The next columns break the information down by the number of

[17] The small number of the entrepreneurial firms in our sample is attributable to the fact that we had requested a significant amount of data on each financing transaction and that most of the data requested are viewed by the funds as highly confidential.
[18] That VC managers finance different types of entrepreneurs in different stages is not unheard of in the U.S. Many VC funds in the U.S. Venture Economics database, for example, indicate a range of investments from seed to buyout, although other U.S. VC funds are prohibited from financing buyouts (see Gompers and Lerner, 1999, 2001).

hours of support received by the entrepreneurial firms from their VCs, including the managing partners and their associates.[19]

[Insert Table 1, and Table 2 Panels A and B About Here]

The first group of numbers in Table 2, Panel A describes the most important contracting features employed in the investments in our sample. Most of the transactions were financed by convertible securities or straight equity, but we observe a small number of debt investments as well.[20] The use of convertibles does not seem to enhance the number of hours investors spend with entrepreneurs. Board representation and the allocation of veto rights reflect however that investors are more involved in firms in which they have more extensive control. In particular, VCs with more extensive board representation tend to provide a greater number of hours. Moreover, the average number of hours is proportionately less when the VCs have partial or no veto control as opposed to full veto control. These observations indicate univariate support for the hypothesis that control rights increase the involvement of VCs in their entrepreneurial firms (Hypothesis 3).

Our data include a number of project risk characteristics. Noteworthy is that contrary to our expectations, VCs spend the highest number of hours with entrepreneurs with the highest experience rankings. Further, there seems to be a strong positive correlation between the number of hours and the stage of development:[21] we observe more hours of support for early stage investments. About half of the firms in the sample were in high-tech industries (biotech, electronics, or Internet). There do not appear to be any differences in the involvement of VCs by industry type. However, VCs report a greater number of hours for investments in countries with lower legality indices. These observations indicate univariate support for the hypothesis that VCs exert more effort on riskier investments (Hypothesis 2).

Concerning the performance of investments, the data suggest that there is generally a negative relation between the average hours of support and total investment duration. This refers to a number of investments in the VCs' portfolio which are neither profitable enough to be exited nor represent failures, but at the same time they are not worth the VC's extensive involvement. Moreover, the information on exit outcomes reflects that most of the IPOs (the most successful exits) to date have received an average of more than 20 hours per month of support.

The last group of numbers in Table 2, Panel A reflects the characteristics of the respondent VCs. 38 of the entrepreneurial firms were financed by limited partnership VCs, 36 by bank-affiliated VCs. We do not observe significant differences in the distribution of hours depending on VC type. Portfolio size

[19] We do not report the entrepreneurs' average hours worked, simply because entrepreneurs generally work full time and it was not feasible to track any variation in entrepreneur hours (see further the discussion in section 5 below).
[20] The pattern of financial contracts observed in this dataset is roughly similar to that reported by Bascha and Walz (2001b) and Schwienbacher (2002a,b) for VCs in Europe.
[21] The venture funds classified the investments as being in one of the following categories: seed, early, expansion, buyout, late and turnaround stage. This classification corresponds to the definition of stages by the European Venture Capital Association (EVCA). We use a simplified classification: we consider the investments as of early (i.e. seed, early or expansion phase) or late (buyout, late, or turnaround phase) stage.

per manager, however, is notably larger among the entrepreneurs that receive fewer than 10 hours per month of support from the VC, consistent with Kanniainen and Keuschnigg (2003, 2004) and Keuschnigg (2004).

Table 2, Panel B provides information pertaining to our advice and monitoring measures. A number of rankings of the importance of VC value-added advice is provided in the first group of numbers including strategic, marketing, financial, R&D, product development, human resources, exit strategy, interpersonal support, and help in networking. The table indicates that for most support activities VCs report higher advice rankings if they spend a higher number of hours with the firm. This observation holds also for the average advice ranking, which we employ in the multivariate empirical analysis.

The second group of numbers in the table reports various types of disagreement between the VC and entrepreneur (including situations in which the VC has replaced the founder as CEO).[22] The most disagreements were with entrepreneurial firms for which VCs spent at least 30 hours per month spent with the entrepreneurial firm. The positive relationship between disagreements and the time spent with the venture reflects that the number of actual conflicts can be a good proxy for the VC's monitoring effort.

3.3. Summary Statistics

Table 3 presents a number of tests for the equality of means and medians that shed further light on the data. Panel A shows the results for the average hours per month spent with the entrepreneurial firm. Panel B includes the advice and disagreement variables.

[Insert Table 3, Panels A, B About Here]

Panel A indicates one major difference in average and median hours per month spent with entrepreneurial firms. When VCs have full veto control (such as over asset sales, purchases, changes in control, issuances of equity, and a number of other important decisions), they are significantly more likely to spend more time with their entrepreneurial firms.

Panel B indicates significantly higher average advice rankings for early stage firms (but there are no significant differences for the medians). Mean and median advice rankings are both significantly higher for transactions in which VCs have full veto control, and for early stage investees. Contrary to expectations, the mean and median rankings of the VCs' contribution are significantly higher for non-IPO exits than for IPO exits. Concerning the extent of conflicts, we do not observe significant differences, but there is suggestive evidence of more frequent conflicts in countries with lower legality indices.

A correlation matrix is provided in Table 4. The matrix gives further insights into the data, and provides guidance in terms of considering issues of collinearity in the regressions in subsequent sections.

[22] Exit related disagreements are excluded from the sum total of different disagreements because not all firms in the sample have gone through the exit process, and because most of the exit conflicts were not with the entrepreneurial team, but rather with other parties.

Table 5 presents correlations across a variety of potentially endogenous variables and various instruments, which are used as a robustness check in the ensuing empirical analyses and discussed in the next section.

[Insert Tables 4 and 5 About Here]

4. Econometric Analysis

This section provides OLS and 2SLS estimations of the three different proxies of the involvement of VCs as dependent variables: the total number of hours per month spent with the venture, the average advice ranking, and the total number of disagreements between the VC and the entrepreneur. Table 6 (Panel A, B) presents the results for the number of hours, Table 7 (Panel A, B) for the advice measure, and Table 8 (Panel A, B) for the disagreement variable. To account for the discrete nature of the disagreement variable, we show both least squares and ordered logit estimates in Table 8.

Each table consists of two panels. In each table, Panel A presents the basic OLS results (together with the ordered logit estimates in Table 8). In Panel B, we address the robustness of these results by showing 2SLS (and instrumental variable ordered logit) estimations of the same specifications as presented in Panel A. To check for the effect of specification bias and collinearity among the explanatory variables, in each panel we present five regressions each based on a different number of explanatory variables. The Akaike information criterion and the adjusted R^2 statistic suggest a preference for Models 3 and 4 in most tables.

Our explanatory variables are broken down into four categories. The relevant variables to test the impact of contractual terms on effort exertion by VCs (namely Hypotheses 1a, 1b, 3 and 4) are shown in the first group in each table. In order to consider how the risk involved in an investment affects the VC's involvement (Hypothesis 2), we employ a number of different proxies for project and environment related uncertainty which are presented in the second group. The last two categories include controls for investment performance and VC fund characteristics in each table.

For reasons discussed in Section 2, several contract specific and investment performance variables may be endogenous to the involvement of VCs. We control for the potential endogeneity, by using two stage least squares estimations, of the following explanatory variables: the convertible security dummy, the VC's ownership share, veto rights, board rights, special control rights, the number of hours by syndicating partners, IPO and acquisition exit dummies, investment months, investment rounds, and VC portfolio size per number of VC managers. In the first step of the regression we estimate these variables as functions of exogenous instruments such as project and environment related risk characteristics, investment and exit year dummies, and returns to the MSCI index over the period of the investment.[23] The instruments might be correlated with, for example exit potential or the experience of VCs, but they

[23] For identification, there must be at least as many instruments as the number of explanatory variables. We use a number of instruments that are not included among the original set of explanatory variables. We also treat some of the original variables as instruments (for which endogeneity is not potentially problematic), which is appropriate for obtaining asymptotically efficient estimates and necessary to satisfy the identification criterion with our set of variables.

are less likely to be correlated with the advice and monitoring measures.[24] While the instruments are not perfect, they are more significantly correlated with the potentially endogenous explanatory variables than the dependent variables. A table presenting correlations among the instruments, the potentially endogenous and the dependent variables is was provided above in Table 5.

We now present our evidence concerning Hypotheses 1-4 and discuss some additional results. The following table provides a summary of the most important findings from the multivariate tests.

Summary of Key Results			
Independent Variables	**Impact on[25]**		
	Total effort	**Advice**	**Monitoring**
Use of Convertible Security	0	+	0
VC Ownership Percentage	+	0	+ / 0
Veto Rights	+ / 0	+	0
Board Rights	0	0	0
Syndication	+	0	+ / 0
Early Stage	+	+	+
Project Risk	0	+	0
Entrepreneur Experience	0	+	-
VC Portfolio Size / # Managers	-	-	-
Success Potential	+ / 0	0	0
Length of Investment Period	+	0	+
Legality	0	0	-

4.1 The Impact of Contract Specific Terms on VC Involvement

Contractual features matter for the involvement of VCs: we find support for all related hypotheses (Hypotheses 1, 3, and 4).

The dataset provides strong support for Hypothesis 3: the more control given to the VC in the form of veto rights, the more intense his effort exertion on the advising task. VCs with full veto control with respect to the five issues considered,[26] give roughly 30% more advice than VCs who have no veto rights in any of these issues. This effect survives when we control for the endogeneity of the "veto rights" variable (see Table 7, Panels A and B). We find that control increases the time spent with the firm too, by

[24] Kortum and Lerner (2000) and Lerner (2002) find that VCs contribute approximately 15% less to innovation in boom periods in the United States, which suggests that our instruments are not ideal. In this European dataset, however, the correlations are not as correlated with the dependent variables and the potentially endogenous explanatory variables (see Table 5). The interaction between effort and years is indirect, via exit conditions and contract decisions. That is, our instruments are based on the premise that investment contract decisions and exits are more closely related to market conditions and year effects, consistent with Gompers and Lerner (1999, 2001), Lerner and Schoar (2002, 2003), and others. Our instruments in this context were not selected on the basis of prior work directly on topic of advcice and monitoring, as such papers did not explicitly control for endogeneity. We considered alternative specifications, which generally yielded similar results. Other specifications are available upon request.

[25] '+' refers to robust positive effect, '-' refers to robust negative effect, 0 refers to no significant impact, and '+ / 0' refers to positive but non-robust estimates.

[26] These issues are asset sales, asset purchases, changes in control, issuance of equity, and other important decisions.

roughly 10-12 hours per month, but this effect is not robust to potential endogeneity of the variable (see Table 6, Panels A and B). The result suggests that VCs do exert more effort in order to increase the possibility for success when they have the majority of veto rights, and thus supports the control related theories of VC financing such as Chan *et al*. (1990) and Kirilenko (2001). This result shows that it is not only cash-flow rights that matter in the provision of incentives: control rights also motivate VCs. The significance of veto rights indicates that VCs tend to use their specific and direct control via veto power rather than via board majority.

In certain specifications, veto control seems to mitigate the number of VC-entrepreneur disagreements (Table 8, Panel B) and the effect is both economically and statistically significant. This suggests that VCs tend to monitor less when they have the right to interfere in entrepreneurial decision-making which refers to a substitution effect between veto control and the need for monitoring. "Special control rights" that include antidilution rights, the right for first refusal in sale, or IPO registration rights seem to be irrelevant for the involvement by VCs.

In a few regressions, our proxy for board control becomes significant with a negative sign, but this effect is economically irrelevant (Table 6 and 7, Panel B). The result is in contrast to Kaplan and Strömberg (2003), who find that board rights enhance monitoring by VCs. In their paper, monitoring is associated with the VCs' involvement in all aspects of human resource policies. As we provide different distinctions between advice and monitoring in the present paper, the results differ from Kaplan and Strömberg (2003).

We also find support for Hypothesis 1, which stresses the role of cash-flow rights: both the use of convertible securities and the allocation of substantial ownership percentage to VCs seem to enhance their involvement. When convertible securities are used, VCs value their contribution roughly 10% more important (see Table 7, Panel A).[27] Large ownership percentage induce VCs to spend more hours with entrepreneurial firms (Table 6, Panels A and B): a 10% increase in the VC's ownership share increases the time spent with the entrepreneur by 3 hours per month on average. This effect is robust to the endogeneity of the variable. Moreover, large ownership percentage increase the VCs' monitoring effort and thus the number of disagreements between VCs and entrepreneurs (Table 8, Panel A). But contrary to expectations, we find no significant effect of the ownership variable to the intensity of advice.

Overall, the results provide evidence for Hypothesis 1a but not for Hypothesis 1b: the bilateral moral hazard models receive support over the theories predicting the optimality of convertible securities in disciplining entrepreneurs. In other words, VCs do need the ownership of substantial cash-flow rights and high-powered incentives to exert optimal effort. The evidence is thus consistent with the predictions of Casamatta (2003), Repullo and Suarez (2004) and Schmidt (2003).

[27] Based on the discussion in section 2, we believe that endogeneity problems are less important for the cash-flow rights variables than for veto and board rights. Given the significance in several specifications, we consider this result as a robust finding.

Last, in Hypothesis 4, we consider the effect of syndication on the involvement of VCs. We find that syndicated transactions can be characterized by complementarities (as opposed to free riding) in effort exertion by syndicate members. An hour extra support from other syndicating partners increases the time spent by the VC with the entrepreneur by approximately 0.5-1 hour per month (see Table 6, Panels A and B). This effect is highly statistically significant and very robust to consideration of potential endogeneity. This result is consistent with empirical regularities of investment syndication in the US (Lerner, 1994).

4.2 The Impact of Risk on VC Involvement

The data provide evidence for the role of project and environment related risk in enhancing the active involvement of VCs in the ventures they finance. The VCs' assessment of project risk and entrepreneurial quality, and the stage of the firm's development are the most important risk factors to consider in this context. Overall, the analysis provides support for Hypothesis 2.

Consistent with our expectations, we find that VCs spend more time with their early stage investments and their contribution in terms of advice and monitoring is also more intense for start-up firms (Table 6, 7, 8, Panels A and B). This effect is large and statistically significant: early stage ventures in our sample received on average 8-10 hours more time per month, 10% more advice, and had disputes concerning one or two more issues related to the firm's development, with their VCs. The result shows that early stage investments represent a primary concern for VCs, which is consistent with earlier findings in Gompers (1995) and Sapienza *et al.* (1996).

We also find a statistically significant and large positive effect of project risk on advice: when VCs value a project as 10% riskier, they give roughly 25-30% more advice (Table 7, Panel A). The effect is robust to alternative specifications in Table 7, Panel B. The risk variable is built on the assessment of VCs of both project and environment related risk involved in their investments, such as "uncertain market size", "uncertainty about product/ technology", "risky competitive position", etc.[28] As a result, it accounts for both "internal" and "external" uncertainty, following the classification used by Kaplan and Strömberg (2003). The distinction between the two risk measures was not meaningful in our data, since they turned out to be very highly (positively) correlated in the sample. Therefore, we use an aggregate of all these risk factors. The result that VCs provide more advice to entrepreneurs with riskier projects is nevertheless consistent with both Sapienza *et al.* (1996) and Kaplan and Strömberg (2003).

The results show a negative correlation between the number of disagreements and entrepreneurial experience. The latter variable is employed to account for the impact of uncertainty related to the entrepreneur's skills and ability. VCs tend to monitor more and advise less entrepreneurs with insufficient experience (Tables 7, 8, Panels A and B). Although both effects are rather small, they are statistically significant and robust to alternative specifications. The positive relation between entrepreneurial experience and advice supports the notion of complementarity of efforts by the contracting parties, as

[28] A detailed description of the proxy for "project risk" is given in Appendix 2.

modelled by several researchers in a bilateral moral hazard setting (Casamatta, 2003; Cestone, 2001; Repullo and Suarez, 2004).

Noteworthy is that project risk and entrepreneurial experience seem to be irrelevant for the number of hours VCs provide. This, together with the above findings indicate that the distinction between different types of effort measures, such as total effort, advice and monitoring, is indeed an essential element of this type of analysis: one may miss important determinants of VCs' involvement if no clear distinction between the different dimensions of effort exertion by VCs is introduced.

Considering the impact of investor protection and legal rules, we find that VCs monitor more their investments in countries with lower legality indices and as a result have more disputes with entrepreneurs in those countries (see Table 8, Panel A). The estimates indicate that an approximately 5-point increase in legality (which is roughly the difference in the legality index between Portugal and the Netherlands) gives rise to on average one fewer disputes. One might intuitively expect better laws and legal certainty to mitigate the scope for disagreement (La Porta *et al*., 1997). However, legality risk is insignificant in the Table 8, Panel B specifications, and does not affect the number of hours (Table 6) or advice (Table 7).

An interesting result is that VCs tend to get involved in Internet based firms to a significantly less extent than in other companies. VCs spend approximately 10-12 hours less time each month with their ventures in the Internet or communications industries (Table 6, Panel A). Moreover, they give 10% less advice to and have on average 1 fewer disagreement with the management of these companies (Tables 7, 8, Panels A and B). Although not robust to all specifications, this negative correlation between the Internet dummy and VC effort is economically and statistically significant with respect to all the three effort measures. Related evidence is consistent with the view that VCs financed more and advised less while taking advantage of the Internet bubble (Gompers and Lerner, 2000; Kortum and Lerner, 2000; Lerner, 2002). The fact that many VCs were able to successfully exit their Internet investments, but many such companies subsequently went bankrupt, reinforces this interpretation. Also noteworthy is that there were no other significant differences with respect to the VCs' involvement in the other two high-tech industries considered in the sample (biotechnology and electronics). These results are indicative that European VCs tend to lack industry-specific expertise, which may hinder their intense involvement in Internet based ventures.

4.3 The Role of Success Potential and VC Fund Characteristics

Concerning the impact of VC fund characteristics, we find that VCs with large portfolios (in terms of the number of investee companies) per number of fund managers become less involved in the development of their ventures. In particular, VCs with one extra entrepreneurial firm per manager in their portfolio provided on average 2-3 hours per month of less support, 20% less advice, and had .2 to .3 fewer disagreements with entrepreneurs (Tables 6, 7, 8, Panels A and B). This result is robust to the endogeneity of the portfolio size per number of managers variable. The evidence implies that there is an upper bound

to the number of ventures which fund managers can efficiently add value to, which is an intuitive result and supports Kanniainen and Keuschnigg (2003, 2004) and Keuschnigg (2004). We find no significant impact of fund type on effort exertion by VCs: in our sample bank-affiliated and limited partnership funds are similar in this respect.

Our evidence with respect to the relation between the project's success potential and VCs' involvement is ambiguous. Based on motives discussed in Section 2, we associate the venture's success potential with the probability of successful exit and consider whether actual and planned exits can be associated with more intense involvement. In the sample, exits via IPO and acquisition seem to have no significant impact on the advising and monitoring activities (Table 7, 8, Panels A and B).[29] Moreover, although venture investors seem to have spent more time with their exited (or to be exited) investments, this effect is not robust to endogeneity problems concerning the "monthly number of hours spent with the venture" variable. Thus our analysis can not provide clean evidence for the role of inherently successful projects in spurring VCs' involvement.

Our findings with respect to the length of the investment period are more indicative: after controlling for the endogeneity of the variable, we find a significant and large positive effect of the number of investment months on the number of monthly hours spent with the venture (Table 6, Panel B). In a few specifications, this positive impact also pertains to the extent of monitoring (Table 8, Panel B). As a consequence, we reject the initial assumption that VCs do not spend time with their moderately successful firms that remain for a long time in their portfolio.

5. Limitations and Future Research

The analysis in this paper is based on a new and fairly comprehensive dataset. However, there are limitations to the breadth and depth of the data that are important to mention. For example, our data do not include details on the investor fixed and performance fees, covenants surrounding the management of the fund, experience of the fund managers, sources of the funds (from pension funds, banks, etc.), changes in our effort measures over time, among other things. Albeit, to the extent that we were able to obtain these details from a subset of the funds, we did not find significant differences in some of these variables, and other variables were correlated with the variables already considered in the paper. Hence, despite the large number of details that are available in the data, there are other elements that could add to the richness in an analysis of investor activities. Moreover, the number of observations for which we could obtain sufficient details is limited (although similar to related prior work on the topic). This is primarily due to the fact that most VC funds are loath to disclose confidential information which limits the breadth and depth of the data that can be analyzed. Nevertheless, despite these limitations, we do not believe there are reasons to expect the results presented above to be materially biased by excluded variables or sample selection problems.

[29] In some specifications in Table 7, Panel B, the IPO dummy becomes statistically significant. The economic significance of the estimate is however close to zero.

A unique and useful feature of our data is that it enables an analysis of information regarding the entrepreneur's and VCs' characteristics, including the syndicate VCs' characteristics. Our data, however, are derived primarily from the VCs, not the entrepreneurs and syndicate VCs. We were able to confirm the accuracy of the information provided in cases where the identities of the entrepreneurs and syndicate VCs could be revealed (in a few ongoing investments this information was considered to be classified), and did not find any material discrepancies or reporting bias.

Finally, we note that the distinction between advice and monitoring can be difficult to disentangle in practice. Our data were derived by meeting with the VCs themselves and reviewing their tasks. The VCs consistently identified the data presented herein as exemplifying advice versus monitoring. In practice, however, a few VCs did point out that the distinction can become blurred depending on the specific context. Our analysis of specific tasks (as detailed in the summary statistics) did not suggest differences depending on broad versus narrow definitions of advice versus monitoring. Further, the broad picture of advice versus monitoring was quite consistent with the ways in which VCs viewed their role in facilitating the development of entrepreneurial firms.

6. Conclusions

We analyzed investors' active participation in monitoring and advice in the VC (and private equity) market, in which these activities are fundamental. We considered three different proxies to effort exerted by VCs: the hours per month spent with entrepreneurs (total effort), the investors' rankings of the importance of their contribution pertaining to different advising fields (advice), as well as the scope of investor-entrepreneur disagreements with respect to a number of issues (monitoring).

Our approach is novel in distinguishing between advice and monitoring on the basis of the congruence of entrepreneurial interests with the purpose of these activities. We argue that advice is congruent while monitoring is dissonant with respect to the entrepreneur's interests and thus the two may have different determinants in terms of incentives and other investment related characteristics. Indeed, our results show that the allocation of cash-flow and control rights and the different project and environment related risk factors affect the three effort measures in different ways. This finding confirms the view that advising and monitoring are inherently different aspects of the investor's involvement in the development of ventures and thus supports the approach taken in theoretical research by Cestone (2001).

Cash-flow and control rights seem to enhance advice but not monitoring. In particular, the use of convertible securities increases the VC's contribution in terms of advice: VCs holding a convertible claim provide on average 10% more advice. We also find support for the role of equity ownership in the provisions of incentives: large VC ownership percentages significantly increase the amount of VC hours spent with entrepreneurs, even after accounting for the potential endogeneity of ownership share with respect to the involvement of VCs. Overall, the results provide support for bilateral moral hazard theories

like Casamatta (2003), Repullo and Suarez (2004) and Schmidt (2003), over the models predicting the use of convertibles in disciplining start-up entrepreneurs.

Our data show that control rights are also important in the provision of incentives for VCs. Veto rights seem to increase significantly the VC's contribution in terms of advice: VCs with full veto control give roughly 30% more advice than VCs with no veto rights. Even if we take into account that the allocation of control rights at contracting will depend on the VC's assessment of the need for his involvement, the role of veto rights in the provision of advice remains important. We find no evidence for the role of board control in inducing VCs' effort on advice. Moreover, both veto and board control seem to be irrelevant for the number of disagreements. These findings confirm the role of control rights in incentivizing VCs, which confirms theories such as Chan *et al.* (1990) and Kirilenko (2001).

We find strong evidence against free riding in syndicated investments: VCs spend on average one hour more each month with their ventures when their syndicating partners also work an additional hour. This refers to complementarities in efforts within investment syndicates, and is consistent with related work showing VC syndicates facilitate value added and thus giving rise to higher returns. We explicitly showed our results are robust to the potential endogeneity of effort exerted by syndicating partners, which is due to the possibility that more diligent VCs may end up in more efficient syndicates.

Our evidence is consistent with some of the earlier results in Gompers (1995), Sapienza *et al.* (1996), and Kaplan and Strömberg (2003) with respect to the role of project and environment related risk factors in enhancing the VCs' involvement. We find that early stage ventures receive more intense involvement than their late stage counterparts and projects ranked as high risk receive significantly more advice. Moreover, entrepreneurs with little experience are provided less advice but more intense monitoring, which refers to a complementarity between entrepreneurial skills and abilities and VCs' advising activity. This complementarity is consistent with the way several authors have modelled VC advising (Casamatta, 2003; Cestone, 2001; Repullo and Suarez, 2004).

Finally, we also find a strong (and robust) negative relation between VC portfolio size and involvement: funds with larger portfolios per manager tend to provide less effort in both activities. The result is intuitive and may refer to an upper bound on the number of investments in the VC's portfolio and thus it is consistent with Kanniainen and Keuschnigg (2003, 2004) and Keuschnigg (2004).

References

Aghion, P. and P. Bolton, 1992. An incomplete contracts approach to financial contracting, Review of Economic Studies 77, 338-401.

Barry, C.B., C.J. Muscarella, J.W. Peavy III, and M.R. Vetsuypens, 1990. The role of venture capitalists in the creation of public companies: evidence from the going public process, Journal of Financial Economics 27, 447-471.

Bascha, A., and U. Walz 2001a. Convertible securities and optimal exit decisions in venture capital finance, Journal of Corporate Finance 7, 285-306.

Bascha, A., and U. Walz, 2001b. Financing practices in the German venture capital industry: an empirical assessment, Working Paper, University of Tünbingen.

Bergmann, D., and U. Hege, 1998. Venture capital financing, moral hazard, and learning. Journal of Banking and Finance 22, 703-735.

Berkowitz, D., K. Pistor, and J.F. Richard, 2003. Economic development, legality, and the transplant effect. European Economic Review 47, 165-195.

Bukart, M., D. Gromb, and F. Panunzi, 1997. Large shareholders, monitoring and the value of the firm, Quarterly Journal of Economics 112, 693-728.

Casamatta, C. 2003. Financing and advising: optimal financial contracts with venture capitalists, Journal of Finance, forthcoming.

Casamatta, C. and C. Haritchabalet, 2003. Learning and syndication in venture capital investments, Working paper, University of Toulouse

Cestone, G., 2000. Venture capital meets contract theory: risky claims or formal control? Working paper, University of Toulouse and Institut d'Analisi Economica, Barcelona.

Chan, Y-S., D.R. Siegel, and A.V. Thakor, 1990. Learning, corporate control and performance requirements in venture capital contracts, International Economic Review 31, 365-382.

Cornelli, F., and O. Yosha, 2003. Stage financing and the role of convertible debt, Review of Economic Studies, forthcoming.

Cumming, D. 2004. The determinants of venture capital portfolio size: empirical evidence. Journal of Business, forthcoming.

Dessi, R., 2001. Start-up finance, monitoring and collusion, Working paper, IDEI, University of Toulouse.

Francis, B.B. and I. Hasan, 2001. The underpricing of venture and nonventure capital IPOs: An empirical investigation. Journal of Financial Services Research 19, 99-113

Gompers, P.A., 1995. Optimal investment, monitoring, and the staging of venture capital, Journal of Finance 50, 1461-1489.

Gompers, P.A., 1997. Ownership and control in entrepreneurial firms: an examination of convertible securities in venture capital investments, Working paper. Harvard Business School.

Gompers, P.A., and J. Lerner, 1999. The Venture Capital Cycle, Cambridge: MIT Press.

Gompers, P.A., and J. Lerner, 2000. Money chasing deals?: The impact of fund inflows on the valuation of private equity investments. Journal of Financial Economics 55, 281-325.

Gompers, P.A. and J. Lerner, 2001. The Money of Invention: How Venture Capital Creates New Wealth, Cambridge: Harvard Business School Press.

Gorman, M., and W. Sahlman, 1989. What do venture capitalists do? Journal of Business Venturing 4, 231-248.

Greene, W., 1998. Limdep Econometrics User Manual. Econometric Software Inc.

Hege, U., F. Palomino and A. Schwienbacher, 2003. Determinants of venture capital performance: Europe and the United States. Working Paper, HEC School of Management.

Hsu, D., 2004. What do entrepreneurs pay for venture capital affiliation? Journal of Finance, forthcoming.

Jensen, M.C., and W.H. Meckling, 1976. Theory of the firm: managerial behaviour, agency costs and ownership structure. Journal of Financial Economics 3, 305-60.

Kanniainen, V, and Keuschnigg, C. 2003. The optimal portfolio of start-up firms in venture capital finance. Journal of Corporate Finance 9, 521-534.

Kanniainen, V., and Keuschnigg, C. 2004. Start-up investment with scarce venture capital support. Journal of Banking and Finance 28, 1935 – 1959.

Kaplan, S.N., and P. Strömberg, 2003. Characteristics, contracts, and actions: evidence from venture capital analyses, Journal of Finance, forthcoming.

Keuschnigg, C., 2002. Venture capital backed growth. Journal of Economic Growth 9, 239 – 261.

Keuschnigg, C., 2003. Public policy and venture capital backed innovation. Working Paper No. 2003-09, University of St. Gallen.

Keuschnigg, C., 2004. Taxation of a venture capitalist with a portfolio of firms. Oxford Economic Papers 56, 285 – 306.

Keuschnigg, C., and Nielsen, S.B. 2001. Public policy for venture capital. International Tax and Public Finance 8, 557-572.

Keuschnigg, C., and Nielsen, S.B. 2003a. Tax policy, venture capital and entrepreneurship. Journal of Public Economics 87, 175-203.

Keuschnigg, C., and Nielsen, S.B. 2003b. Taxes and venture capital support. Review of Finance 7, 515 – 539.

Keuschnigg, C., and Nielsen, S.B. 2004a. Progressive taxation, moral hazard, and entrepreneurship. Journal of Public Economic Theory 6, 471 – 490.

Keuschnigg, C., and Nielsen, S.B. 2004b. Start-ups, venture capitalists, and the capital gains tax. Journal of Public Economics 88, 1011-1042.

Kirilenko, Andrei A., 2001. Valuation and control in venture finance. Journal of Finance 56, 565-587.

Kortum, S., and J. Lerner, 2000. Assessing the Contribution of Venture Capital to Innovation. RAND Journal of Economics 31, 647-692.

La Porta, R., F. Lopez-De-Silanes, A. Shleifer and R. Vishny, 1997. Legal determinants of external finance. Journal of Finance 52, 1131-1150.

Lerner, J., 1994. The syndication of venture capital investments, Financial Management 23, 16-27.

Lerner, J., 1995. Venture Capitalists and the Oversight of Private Firms, Journal of Finance 50, 301-318.

Lerner, J., 2002. Boom and Bust in the Venture Capital Industry and the Impact on Innovation. Federal Reserve Bank of Atlanta Economic Review 2002(4), 25-39.

Lerner, J. and A. Schoar, 2002. The Illiquidity Puzzle: Theory and Evidence from Private Equity. Journal of Financial Economics, forthcoming.

Lerner, J. and A. Schoar, 2003. Does legal enforcement affect financial transactions? The contractual channel in private equity. Quarterly Journal of Economics, forthcoming.

Mayer , C., K., Schoors, and Y., Yafeh, 2002. Sources of funds and investment activities of venture capital funds : Evidence from Germany, Israel, Japan and the UK. Journal of Corporate Finance, forthcoming.

Megginson, W.L., and K.A. Weiss, 1991. Venture capitalist certification in initial public offerings, Journal of Finance 46, 879-903.

Moskowitz, T., and A. Vissing-Jorgensen, 2002. The returns to entrepreneurial investment: a private equity premium puzzle? American Economic Review 92, 745-778.

Neus, W., and U. Walz, 2004. Exit timing of venture capitalists in the course of an initial public offering. Journal of Financial Intermediation, forthcoming.

Repullo, R., and J. Suarez, 2004. Venture capital finance: a security design approach, Review of Finance 8, 75-108.

Sahlman, W.A., 1990. The structure and governance of venture capital organizations, Journal of Financial Economics 27, 473-521.

Sapienza, H., 1992. When do venture capitalists add value? Journal of Business Venturing 7, 9-27.

Sapienza, H., S. Manigart, and W. Vermeir, 1996. Venture capital governance and value-added in four countries. Journal of Business Venturing 11, 439-469.

Schmidt, K.M., 2003. Convertible securities and venture capital finance, Journal of Finance, forthcoming.

Schwienbacher, A., 2002a. Innovation and venture capital exits, Working paper, University of Amsterdam.

Schwienbacher, A., 2002b. An empirical analysis of venture capital exits in Europe and the United States, Working paper, University of Amsterdam.

White, H., 1980. A heteroskedastic-consistent covariance matrix estimator and a direct test for heteroskedasticity, Econometrica 48, 817-838.

Wright, M., and A. Lockett, 2003. The structure and management of alliances: syndication in the venture capital industry. Journal of Management Studies 40, 2073-2104.

Table 1. Definition of Variables

This table provides an exact definition for each of the most important variables considered in the paper.[30]

VC Hours	Monthly number of hours VC spends with the venture
Advice	Average of the VC's rankings, on a scale 1-10, of his contribution to the venture in the following advising fields: strategy, marketing, issues related to financing, R&D, product development, human resources, exit strategy advice, interpersonal support, help in networking, any other
Monitoring (Disagreement)	Total number of fields for which the VC reported disagreement with the entrepreneur. Fields considered: strategy, marketing, issues related to financing, R&D, product development, human resources, replacement of founder, any other
Convertible Security	Dummy variable for investments financed either with convertible debt or convertible preferred equity
VC Ownership Share	% Ownership of VC; given contingencies in contracts, the best case scenario is considered
Veto Rights	Average of the following veto right dummies: asset sales, asset purchases, changes in control, issuance of equity, any other decisions
Board Rights	VC board seats as % of total number of board seats at the company
Special Control Rights	Average of the following control dummies (dummy takes value 1 if VC has the right): right to replace CEO, automatic conversion at exit, right for first refusal at sale, co-sale agreement, anti-dilution protection, protection rights against new issues, redemption rights, information rights, IPO registration rights, piggyback registration
Hours from Syndicated Partners	Monthly number of hours syndicating partners spend with the venture
Investment Rounds	Number of rounds the VC financed the investment
Book Value	Log of the book value of the investment measured in € '000
Project Risk	Average of the VC's rankings of the following risk factors: uncertain market size, uncertainty about product, risky competitive position, uncertain customer adoption, risks in business strategy, questionable performance to date, contractual structure, high valuation, costly to monitor, exit conditions, negative influence of other investors
Entrepreneur Experience	VC's ranking of the entrepreneur's experience on a scale of 1-10
Legality	Weighted average of following factors (based on Berkowitz et al. (2003)): civil versus common law systems, efficiency of judicial system, rule of law, corruption, risk of expropriation, risk of contract repudiation, shareholder rights. Higher numbers indicate 'better' legal systems.
Investment Months	Number of investment months from first investment date to exit (for exited investments) or to 12/2002 (for non-exited investments)
VC Portfolio Size / # VC Managers	The number of entrepreneurial firms in the VC fund portfolio per the number of VC managers.

[30] This table does not list several dummy variables that are easy to interpret.

Table 2. Summary of the Data by Monthly Hours Spent with the Entrepreneurial Firm

This table presents a summary of the data in terms of the average number of hours per month spent with the entrepreneurial firm by the respondent VC. Panel A presents the characteristics of the respondent VCs (type of VC, capital under management), entrepreneurial firm characteristics (legality index of the country of location, foreign versus domestic investments, stage of development, industry), transaction specific (number of hours syndicated partners, type of securities used, board composition, allocation of veto and ownership rights, number of rounds, and book value) and performance characteristics (investment duration, and the actual and expected IPOs and acquisitions). Panel B shows the average advice ranking for 9 different advising fields, the number of disagreements in 8 possible matters including appointing a new CEO, the number of conflicts related to exit with founder and other parties, the average risk ranking of investments for 13 different risk factors, and the average rank of the entrepreneurs' experience. Some important variables are typed bold.

Panel A					
	Total	Hours < 10	10 ≤ Hours < 20	20 ≤ Hours< 30	30 ≤ Hours
Respondent VC Hours	**74**	**31**	**17**	**9**	**17**
Contractual Terms					
Number of Common Equity and/or Warrant Investments	38	18	9	3	8
Number of Convertible Pref. Equity and/or Conv. Debt Inv.	28	12	6	2	8
Number of Debt and/or Preferred Equity Investments	8	1	2	4	1
Average VC Ownership	0.29	0.31	0.26	0.22	0.32
Average VC Board Seats / Total Board Seats	**0.25**	**0.23**	**0.22**	**0.30**	**0.31**
Number of Investments with Partial or No Veto Control	27	13	11	2	1
Number of Investments with Full Veto Control	47	18	6	7	16
Average Number of Financing Rounds	1.64	1.35	1.76	1.56	2.06
Syndicated VC Hours	74	46	12	4	12
Average Book Value ('000)	5,570	3,255	11,939	2,616	4,987
Project and Environment Related Risk					
Average Overall Risk Ranking	4.46	4.42	4.03	3.69	4.37
Average ENT Experience Ranked on Scale 1-10	**6.57**	**6.65**	**6.35**	**6.58**	**6.76**
Number of Early (Seed / Start-up / Expansion) Stage Inv.	53	21	11	7	13
Number of Late (Late / Buyout / Turnaround) Stage Inv.	21	10	6	1	4
Number of Investments in High-tech Industry	38	14	9	9	6
Number of Investments in Non-tech Industry	36	17	8	0	11
Average Legality Index in Entrepreneur's Country	**19.53**	**20.06**	**19.29**	**17.89**	**17.68**
Number of Foreign VC Investments	14	8	1	0	5
Number of Domestic VC Investments	60	23	16	9	12
Investment Performance					
Average Investment Duration (Months)	30.73	33.93	33.88	25.11	24.70
Number of Actual IPOs	**5**	**1**	**0**	**2**	**2**
Number of Expected IPOs	7	4	2	0	1
Number of Actual Acquisitions	11	2	6	0	3
Number of Expected Acquisitions	22	4	7	6	5
VC Characteristics					
Number of Limited Partnership VCs	38	16	10	4	8
Number of Bank Affiliated VCs	36	15	7	5	9
Average Capital Under Management ('000) per VC Manager	17,888	21,922	18,290	24,422	23,217
VC Portfolio Size per # VC Managers	**2.15**	**2.97**	**1.06**	**1.72**	**2.00**

Panel B					
	Total	Hours < 10	10 ≤ Hours < 20	20 ≤ Hours< 30	30 ≤ Hours
Average VC Advice Ranked on Scale 1-10					
Strategic Advice	3.99	3.10	3.94	5.22	5.00
Marketing Advice	1.91	1.29	1.65	4.00	2.18
Financial Advice	4.64	4.65	3.35	6.11	5.12
R&D Advice	0.80	0.84	0.18	1.11	1.18
Product Development Advice	0.88	0.84	0.41	0.56	1.59
Human Resource Advice	1.91	1.29	1.53	2.78	2.94
Exit Strategy Advice	3.04	2.74	3.53	1.56	3.88
Interpersonal Support	1.66	0.94	1.76	1.67	2.88
Help in Networking	2.73	1.94	1.76	3.89	4.53
Average Overall Advice Ranking	**2.39**	**1.96**	**2.01**	**2.99**	**3.25**
Number of Disagreements with Management Team					
Strategy	21	4	6	2	9
Marketing	8	1	1	3	3
Financial	11	3	1	0	7
R&D	3	1	0	1	1
Product Development	8	1	1	1	5
Human Resources	7	1	1	1	4
Other	1	1	0	0	0
VC has replaced founder as CEO	7	1	0	0	6
Total Number of Disagreements	**66**	**13**	**10**	**8**	**35**

Table 3. Descriptive Statistics

This table presents mean and median comparison tests. In Panel A we consider the average monthly hours spent with the entrepreneurial firms by the respondent VC. We compare the means and medians of hours of early versus late stage firms, high-tech versus non high-tech firms, limited partner versus bank VC financed firms, convertible preferred equity financed firms versus firms that used other securities, investments when VCs have full veto control to investments when they had partial or no veto control, investments in which VCs have majority board control to those in which they have minority board representation, investments which VCs have exited or will soon exit through IPO to investments which VCs have exited in other ways or have not yet exited, and countries with high and low legality indices. Panel B considers the average advice ranking and the number of disagreements and shows mean and median comparison tests by the same classification as Panel A. Significantly different means, medians and the corresponding F and Mann-Whitney test statistics are typed bold. *,**,*** refer to significance at the 10%, 5% and 1% levels.

Panel A

	N	Mean	Median	Mean Equality Test F-statistic	Median Equality Test Mann-Whitney Stat.
All Investee Firms	74	15.48	10.00	-	-
Convertible Preferred Equity / Debt vs. No Convertible Preferred Equity / Debt Financing					
Convertible Security	28	17.00	10.00	0.619	p <= 0.543
No Convertible Security	46	14.55	10.00		
Partial Veto Control vs. Full Veto Control for VC					
Partial Veto	27	**7.93**	**10.00**	**3.96*** **	p <= 0.559
Full Veto	47	**19.82**	**12.50**		
Majority Board Seats for VC vs. No Majority Board Seats for VC					
Majority	10	17.00	5.50	0.25	p <= 0.371
No Majority	64	15.24	10.00		
Early vs. Late Stage Firms					
Early Stage	53	16.46	10.00	0.95	p <= 0.71
Late Stage	21	12.71	10.00		
IPO Exit vs. No IPO or No Exit					
IPO exit	12	19.08	10.00	0.63	p <= 0.913
No IPO exit	62	14.78	10.00		
Limited Partner (LP) vs. Bank VC Financed Firms					
Limited Partner	38	14.04	10.00	0.82	p <= 0.969
Bank	36	17.00	10.00		
High Legality Index Country vs. Low Legality Index Country					
Legality Index > 20	49	13.82	10.00	1.23	p <= 0.504
Legality Index < 20	25	18.74	15.00		

Panel B						
		N	Mean	Median	Mean Equality Test F-statistic	Median Equality Test Mann-Whitney Stat.
All Investee Firms						
Advice		74	2.39	1.83	-	-
Disagreement		74	0.89	0.00	-	-
Convertible Preferred Equity / Debt vs. No Convertible Preferred Equity / Debt Financing						
Advice	Convertible	28	2.82	2.77	1.63	p <= 0.472
	No Conv.	46	2.13	1.66		
Disagreement	Convertible	28	1.36	0.00	0.51	p <= 1
	No Conv.	46	0.83	0.00		
Partial Veto Control vs. Full Veto Control for VC						
Advice	Partial Veto	27	**1.27**	**0.55**	**4.80*****	**p <= 0.0006*****
	Full Veto	47	**3.04**	**2.77**		
Disagreement	Partial Veto	27	0.85	0.00	0.84	p <= 1
	Full Veto	47	1.00	0.00		
Majority Board Seats for VC vs. No Majority Board Seats for VC						
Advice	Majority	10	2.29	2.22	0.23	p <= 0.736
	No Majority	64	2.41	1.67		
Disagreement	Majority	10	0.80	0.00	0.26	p <= 1
	No Majority	64	0.91	0.00		
Early vs. Late Stage Firms						
Advice	Early Stage	53	**2.63**	**2.67**	**2.30****	**p <= 0.038****
	Late Stage	21	**1.80**	**1.67**		
Disagreement	Early Stage	53	1.02	0.00	1.48	p <= 1
	Late Stage	21	0.57	0.00		
IPO Exit vs. No IPO or No Exit						
Advice	IPO Exit	12	**1.43**	**1.11**	**2.50****	p <= 0.357
	No IPO Exit	62	**2.58**	**2.22**		
Disagreement	IPO Exit	12	0.67	0.00	0.70	p <= 1
	No IPO Exit	62	0.94	0.00		
Limited Partner (LP) vs. Bank Venture Capitalist Financed Firms						
Advice	LP	38	2.13	1.67	1.29	p <= 0.245
	Bank	36	2.67	2.78		
Disagreement	LP	38	0.84	0.00	0.31	p <= 1
	Bank	36	0.94	0.00		
High Legality Index Country vs. Low Legality Index Country						
Advice	Legality>20	49	2.24	1.67	0.99	p <= 0.326
	Legality<20	25	2.68	2.22		
Disagreement	Legality>20	49	0.69	0.00	1.54	p <= 1
	Legality<20	25	1.28	1.00		

Table 4. Correlation Matrix[31]

	Monthly Hours	Advice	Disagr.	Conv. Secur..	Owner-ship	Veto Rights	Board Righta	Special Control	Syndic. Hours	Invest. Rounds	Book Value	Project Risk	Ent. Exper.	Stage	Biotech	Electro	Internet	Legal.	Foreign	Inv. Months	IPO	Acquis.	Limited Partner	Fund Capital
Monthly Hours	1																							
Advice	**0.39**	1																						
Disagreement	**0.40**	0.19	1																					
Convertible Security	0.07	0.17	0.04	1																				
VC Ownership Share	0.08	0.008	-0.01	**0.28**	1																			
Veto Rights	**0.35**	**0.53**	0.17	0.03	0.22	1																		
Board Rights	0.16	0.12	0.12	-0.05	**0.37**	0.40	1																	
Special Control Rights	0.20	0.20	0.14	**0.30**	0.13	0.18	0.004	1																
Hours from Syndicated Partners	**0.48**	0.16	**0.41**	0.04	**-0.25**	0.22	-0.19	0.19	1															
Investment Rounds	0.23	0.11	0.13	0.06	-0.23	-0.18	-0.19	0.18	0.18	1														
Book Value	-0.07	**-0.25**	-0.05	-0.05	0.18	0.05	**0.24**	-0.23	-0.13	-0.16	1													
Project Risk	-0.17	0.08	-0.06	-0.03	-0.25	-0.16	-0.10	**-0.26**	-0.02	-0.02	0.19	1												
Entrepreneur Experience	0.11	0.11	-0.19	-0.13	-0.11	0.09	0.12	-0.07	0.10	-0.19	0.21	0.07	1											
Stage	-0.10	-0.20	-0.14	0.19	**0.31**	0.16	0.15	-0.16	0.06	**-0.36**	**0.37**	-0.05	-0.04	1										
Biotech	-0.06	-0.10	**0.28**	-0.22	-0.03	0.007	0.12	0.16	-0.10	-0.01	-0.16	**-0.28**	-0.19	-0.17	1									
Electronics	0.04	0.19	0.05	0.007	0.06	-0.09	-0.15	0.08	0.04	0.11	-0.20	0.03	-0.13	-0.18	-0.17	1								
Internet	-0.06	-0.18	-0.05	**-0.31**	**-0.37**	-0.10	0.02	-0.02	0.16	0.07	-0.01	0.22	0.05	-0.21	-0.13	**-0.29**	1							
Legality	-0.06	-0.08	-0.23	**0.40**	**0.27**	-0.12	**-0.35**	0.02	-0.11	**0.27**	-0.05	-0.18	**-0.25**	0.12	-0.12	0.02	**-0.38**	1						
Foreign Investment	-0.02	-0.07	0.05	**0.47**	0.09	-0.17	-0.17	**0.43**	0.05	0.08	-0.15	-0.17	-0.05	0.004	0.001	0.004	-0.14	**0.24**	1					
Investment Months	**-0.32**	-0.15	-0.06	-0.07	0.19	0.03	0.21	-0.05	-0.14	-0.15	0.06	-0.14	-0.16	0.18	0.22	-0.16	-0.12	0.02	-0.02	1				
IPO Exit	0.10	**-0.25**	-0.08	-0.13	-0.10	-0.30	-0.18	-0.21	0.04	-0.12	0.03	0.03	0.08	0.05	0.02	-0.11	**0.27**	-0.14	-0.03	-0.07	1			
Acquisition Exit	0.09	-0.08	0.14	-0.06	-0.13	0.02	**0.25**	0.12	0.06	0.15	0.19	-0.07	-0.08	0.04	0.07	-0.14	-0.003	-0.19	-0.11	0.11	**-0.42**	1		
Limited Partnership	-0.10	-0.18	-0.06	0.11	-0.08	**-0.32**	0.10	-0.10	-0.08	-0.05	-0.05	0.23	-0.10	0.21	-0.07	-0.10	0.14	**-0.39**	**0.24**	0.02	0.19	0.18	1	
VC Portfolio Size per Managers	-0.18	-0.08	**-0.24**	-0.10	0.006	-0.14	**-0.30**	-0.04	0.006	0.008	-0.19	0.08	0.13	**-0.26**	0.03	0.05	-0.11	**0.28**	0.09	-0.17	-0.01	**-0.40**	**-0.24**	1

[31] The significant correlation coefficients (the ones greater than 0.23 are significant at the 5% level) are indicated in bold and underlined font in the table.

Table 5. Correlation Among Instruments, Dependent, and Potentially Endogenous Variables

	Instruments											
	Investment Year						Exit Year					MSCI Market Return over Investment Period
	1997	1998	1999	2000	2001	2002	2000	2001	2002	2003	2004 or 2005 (planned)	
Dependent Variables												
Monthly Hours	-0.12	-0.11	-0.01	0.13	0.16	-0.10	0.00	-0.04	**0.36**	0.12	**0.25**	0.01
Advice	-0.05	-0.08	**-0.25**	0.12	0.15	0.13	-0.18	-0.05	0.11	0.06	**0.23**	-0.15
Disagreement	-0.07	-0.18	0.20	0.03	0.09	-0.16	-0.12	-0.07	**0.27**	0.02	**0.28**	-0.06
Potentially Endogenous Explanatory Variables												
Convertible Security	0.15	0.05	**-0.25**	0.11	0.08	0.02	0.03	0.15	0.05	-0.14	-0.06	-0.05
VC Ownership Share	**0.25**	0.21	0.10	-0.17	-0.00	-0.13	-0.15	-0.02	-0.01	-0.18	-0.08	-0.00
Veto Rights	0.08	0.21	-0.20	0.04	-0.02	-0.05	0.15	0.07	-0.01	0.04	**0.24**	0.21
Board Rights	0.14	0.03	0.04	-0.16	-0.07	0.01	-0.01	-0.03	0.05	-0.09	**0.34**	0.20
Special Control Rights	0.09	-0.02	**-0.23**	**0.25**	0.03	-0.04	-0.09	0.09	-0.03	0.11	**0.27**	-0.18
Syndicates VC Hours	-0.07	-0.08	0.00	0.19	-0.01	-0.11	0.11	0.00	0.14	0.14	0.12	0.03
Investment Rounds	-0.09	-0.14	0.00	0.19	-0.06	0.03	-0.04	-0.09	0.10	**0.24**	-0.07	-0.14
Investment Months	**0.25**	0.14	**0.24**	-0.06	**-0.31**	**-0.51**	0.00	0.02	-0.15	0.02	0.04	0.20
IPO Exit	-0.05	-0.08	**0.23**	-0.03	0.04	-0.15	0.06	-0.05	0.22	0.00	-0.04	0.04
Acquisition Exit	-0.11	0.16	0.07	-0.14	-0.12	-0.05	**0.25**	0.13	-0.21	**0.23**	**0.43**	**0.23**
VC Portfolio Size per Number of VC Managers	0.09	-0.14	-0.12	0.18	0.06	0.18	**-0.30**	-0.09	-0.05	-0.09	-0.19	**-0.40**

Table 6. Panel A. OLS Estimates of Hours per Month

This table presents OLS estimates of the number of hours per month that the venture capitalist spends with the entrepreneurial firm. Independent variables include the terms of contract (a dummy equal to one for convertible preferred equity investments, the percentage of the VC's ownership share, the fraction of veto rights, board rights, and other "special" control rights held by the VC, the number of hours per month from syndicated VCs, the number of investment rounds, and the log of the book value of the investment), project risk characteristics (the VC's ranking of project risk and entrepreneur experience, a late stage investment dummy, industry dummy variables, the legality index of the country of the investment, a dummy equal to one for entrepreneurs in foreign countries), investment performance characteristics (the number of investment months and dummy variables equal to one for IPO and acquisition exits), and characteristics of the venture capital fund (a dummy equal to one for limited partnership VCs and the VC firm's capital under management per VC fund managers). White's (1980) HCCME is used. *, **, *** represent estimates significant at the 1%, 5%, and 10% levels, respectively.

Independent Variables	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	**20.51**	**3.88*****	**10.36**	**1.70***	1.43	0.17	10.20	1.02	14.87	0.46
Contractual Terms										
Convertible Security (H1)	2.10	0.47	2.30	0.54	1.88	0.50	-3.23	-0.92	-2.22	-0.66
Ownership % (H1)	10.42	0.65	4.60	0.30	20.83	1.50	**25.69**	**2.30****	**30.67**	**2.67*****
Veto Rights (H3)	-	-	**13.64**	**4.01*****	**7.96**	**2.10****	**11.36**	**3.26*****	**12.15**	**3.22*****
Board Rights (H3)	-	-	-0.003	-0.47	-0.001	-0.15	0.003	0.65	0.002	0.44
Special Control Rights (H3)	-	-	-	-	-	-	-	-	-1.49	-0.23
Hours from Syndicated Partners (H4)	-	-	-	-	**0.49**	**5.60*****	**0.40**	**5.51*****	**0.38**	**5.07*****
Investment Rounds	-	-	-	-	-	-	**3.81**	**2.59****	**4.00**	**2.55****
(Log of) Book Value	-	-	-	-	0.51	0.72	-0.21	-0.28	-0.96	-1.13
Project and Environment Related Risk										
Project Risk Ranking (H2)	-	-	-5.08	-0.53	-9.77	-1.12	-4.07	-0.46	2.51	0.29
Entrepreneur Experience Ranking (H2)	-	-	-	-	-	-	0.21	0.40	0.24	0.43
Late or Buyout Stage (H2)	-6.29	-1.62	**-8.48**	**-2.35****	**-10.50**	**-3.22*****	**-9.15**	**-2.47****	**-7.44**	**-1.89***
Medical / Biotechnology (H2)	-	-	-	-	-	-	-4.70	-0.92	-5.33	-0.93
Computer / Electronics (H2)	-	-	-	-	-	-	-4.92	-1.54	-3.95	-1.13
Communications / Internet (H2)	-	-	-	-	-	-	**-11.58**	**-2.82*****	**-11.16**	**-2.48****
Country Legality (H2)	-	-	-	-	-	-	-	-	-0.39	-0.50
Foreign Investment (H2)	-0.51	-0.01	0.27	0.05	-2.85	-0.63	-0.79	-0.20	1.87	0.39
Investment Performance										
Investment Months	-	-	-	-	-	-	**-0.30**	**-3.35*****	**-0.30**	**-3.61*****
IPO Exit	-	-	-	-	-	-	**10.76**	**2.44****	**16.26**	**3.26*****
Acquisition Exit	-	-	-	-	-	-	-	-	**7.74**	**2.09****
VC Fund Characteristics										
Limited Partnership VC	-4.12	-1.05	0.55	0.12	1.74	0.42	0.96	0.29	-2.92	0.74
VC Portfolio Size / # of VC Managers	**-2.28**	**-2.69*****	**-1.93**	**-2.37****	-1.19	-1.55	**-2.39**	**-2.67*****	**-1.69**	**-1.88***
Number of Observations	74		74		74		74		74	
Adjusted R^2	0.01		0.08		0.31		0.47		0.48	
LogLikelihood	-304.26		-299.76		-287.98		-273.92		-271.29	
Akaike Information Criterion	8.41		8.37		8.10		7.92		7.93	
F-statistic	1.11		1.72		3.99***		4.57***		4.16***	

Table 6. Panel B. 2SLS Estimates of Hours per Month

This table presents 2SLS estimates of the number of hours per month that the venture capitalist spends with the entrepreneurial firm. Independent variables are as defined in Panel A with the exception of the following variables that are treated as potentially endogenous: the convertible preferred equity dummy, the fraction of veto rights, board rights, and other "special" control rights held by the VC, the percentage of the VC's ownership share, the number of hours per month from syndicated VCs, the number of investment rounds, the number of investment months, the IPO and acquisition exit dummy variables, and the capital under management per VC fund managers. The following variables are used as instruments: the VC's ranking of project risk and entrepreneur experience, the log of the book value of the investment, the legality index of the country of the investment, a dummy for entrepreneurs in foreign countries, a late stage investment dummy, industry dummy variables, the limited partnership dummy variable for the VC, dummy variables for the investment and exit years, and the log of the MSCI returns over the period of the investment. White's (1980) HCCME is used. *, **, *** represent estimates significant at the 1%, 5%, and 10% levels, respectively.

Independent Variables	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	**20.08**	**2.91*****	14.43	1.57	-1.08	-0.09	-3.55	-0.10	-43.59	-0.84
Contractual Terms										
Convertible Security (H1)	-3.27	-0.59	-7.21	-1.35	**-8.77**	**-1.69***	**-10.33**	**-1.87****	**-11.11**	**-1.99****
Ownership % (H1)	22.47	1.20	18.78	0.98	**32.89**	**2.40****	**38.76**	**1.64***	5.92	0.18
Veto Rights (H3)	-	-	6.68	1.09	-4.30	-0.72	-0.87	-0.07	5.98	0.23
Board Rights (H3)	-	-	**-0.06**	**-2.69*****	**-0.05**	**-2.63*****	-0.03	-0.91	-0.01	-0.36
Special Control Rights (H3)	-	-	-	-	-	-	-	-	3.26	0.08
Hours from Syndicated Partners (H4)	-	-	-	-	**0.85**	**4.28*****	**0.67**	**2.07****	**0.66**	**2.22****
Investment Rounds	-	-	-	-	-	-	1.64	0.19	-13.56	-0.85
(Log of) Book Value	-	-	-	-	0.97	0.79	0.94	-0.06	1.39	0.68
Project and Environment Related Risk										
Project Risk Ranking (H2)	-	-	0.85	0.08	-12.93	-1.17	-6.01	-0.37	-15.19	-0.65
Entrepreneur Experience Ranking (H2)	-	-	-	-	-	-	0.36	0.26	-0.55	-0.32
Late or Buyout Stage (H2)	-6.67	-1.32	-8.52	-1.62	**-9.17**	**-1.75***	-5.87	-0.66	-18.03	-1.34
Medical / Biotechnology (H2)	-	-	-	-	-	-	2.77	0.31	3.07	0.26
Computer / Electronics (H2)	-	-	-	-	-	-	-4.31	-0.78	-1.31	-0.14
Communications / Internet (H2)	-	-	-	-	-	-	-9.70	-1.58	-7.99	-0.99
Country Legality (H2)	-	-	-	-	-	-	-	-		
Foreign Investment (H2)	3.08	0.55	**9.05**	**1.74***	3.74	0.71	2.75	0.44	-0.84	-0.06
Investment Performance										
Investment Months	-	-	-	-	-	-	**17.09**	**1.74****	**21.12**	**1.83***
IPO Exit	-	-	-	-	-	-	0.25	0.03	0.49	0.01
Acquisition Exit	-	-	-	-	-	-	-	-		
VC Fund Characteristics										
Limited Partnership VC	-4.27	-1.03	0.79	0.16	4.58	1.13	3.00	0.62	12.54	1.10
VC Portfolio Size / # of VC Managers	**-3.07**	**-2.21****	**-4.34**	**-2.97****	-1.08	-0.73	-3.01	-1.40	-3.17	-1.31
Number of Observations	74		74		74		74		74	
Adjusted R^2	0.03		0.11		0.26		0.26		0.24	
LogLikelihood	-303.47		-298.73		-290.79		-285.99		-285.52	
Akaike Information Criterion	8.39		8.34		8.18		8.24		8.28	
F-statistic	1.37		1.96**		3.28***		2.45***		2.18***	

Table 7. Panel A. OLS Estimates of Advice

This table presents OLS estimates of the venture capitalist's average advice ranking for assistance provided to the entrepreneurial firm. Independent variables include contractual term specific characteristics (a dummy equal to one for convertible preferred equity investments, the percentage of the VC's ownership share, the fraction of veto rights, board rights, and other "special" control rights held by the VC, the number of hours per month from syndicated VCs, the number of investment rounds, and the log of the book value of the investment), project risk characteristics (the VC's ranking of project risk and entrepreneur experience, a late stage investment dummy, industry dummy variables, a dummy equal to one for entrepreneurs in foreign countries, and the legality index of the country of the investment), investment performance characteristics (the number of investment months and dummy variables equal to one for IPO and acquisition exits), and characteristics of the venture capital fund (a dummy equal to one for limited partnership VCs and the VC firm's capital under management per VC fund managers). White's (1980) HCCME is used. *, **, *** represent estimates significant at the 1%, 5%, and 10% levels, respectively.

Independent Variables	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	**3.06**	**5.17*****	0.41	0.71	**2.31**	**2.96****	1.64	1.64	3.31	1.19
Contractual Terms										
Convertible Security (H1)	**1.11**	**2.79*****	**0.97**	**2.82*****	**0.83**	**2.59****	0.48	1.27	**0.62**	**1.93***
Ownership % (H1)	0.18	0.16	-0.52	-0.52	-0.11	-0.12	-0.19	-0.24	-0.07	-0.09
Veto Rights (H3)	-	-	**2.65**	**5.92*****	**2.57**	**5.63*****	**2.63**	**5.63*****	**2.45**	**5.17*****
Board Rights (H3)	-	-	**0.001**	**1.69***	0.001	1.51	0.001	1.20	-	-
Special Control Rights (H3)	-	-	-	-	-	-	0.24	0.31	-	-
Hours from Syndicated Partners (H4)	-	-	-	-	-0.003	-0.29	-0.008	-0.78	-0.008	-0.77
Investment Rounds	-	-	-	-	-	-	0.25	1.10	0.34	1.36
(Log of) Book Value	-	-	-	-	**-0.25**	**-2.98*****	**-0.30**	**-4.13*****	**-0.30**	**-3.65*****
Project and Environment Related Risk										
Project Risk Ranking (H2)	-	-	1.32	1.49	**2.15**	**2.59*****	**2.46**	**2.83*****	**2.30**	**2.60****
Entrepreneur Experience Ranking (H2)	-	-	-	-	-	-	**0.14**	**1.98****	**0.14**	**1.85****
Late or Buyout Stage (H2)	**-1.11**	**-2.97*****	**-1.36**	**-4.15*****	**-0.98**	**-2.92*****	**-0.86**	**-1.88****	**-0.80**	**-1.80****
Medical / Biotechnology (H2)	-	-	-	-	-	-	-0.47	-0.63	-0.46	-0.68
Computer / Electronics (H2)	-	-	-	-	-	-	0.30	0.75	0.26	0.64
Communications / Internet (H2)	-	-	-	-	-	-	-1.03	-1.50	**-1.06**	**-1.68***
Country Legality (H2)	-	-	-	-	-	-	-	-	-0.07	-0.64
Foreign Investment (H2)	-0.71	-1.42	-0.31	-0.83	-0.26	-0.74	-0.28	-0.82	-0.19	-0.63
Investment Performance Characteristics										
Investment Months	-	-	-	-	-	-	-0.008	-0.84	-0.006	-0.71
IPO Exit	-	-	-	-	-	-	0.12	0.33	-0.05	-0.13
Acquisition Exit	-	-	-	-	-	-	-	-	-0.24	-0.61
VC Fund Characteristics										
Limited Partnership VC	-0.55	-1.29	0.05	0.12	-0.18	-0.43	-0.01	-0.04	-0.16	-0.45
VC Portfolio Size / # of VC Managers	**-0.19**	**-1.88***	-0.07	-0.74	-0.14	-1.59	**-0.22**	**-2.21****	**-0.26**	**-2.78*****
Number of Observations	74		74		74		74		74	
Adjusted R^2	0.10		0.37		0.40		0.44		0.44	
LogLikelihood	-140.46		-125.29		-122.34		-114.90		-114.98	
Akaike Information Criterion	3.98		3.66		3.63		3.65		3.65	
F-statistic	2.35**		5.86***		5.50***		4.02***		4.01***	

Table 7. Panel B. 2SLS Estimates of Advice

This table presents 2SLS estimates of the venture capitalist's average advice ranking for assistance provided to the entrepreneurial firm. Independent variables are as defined in Panel A with the exception of the following variables that are treated as potentially endogenous: the convertible preferred equity dummy, the fraction of veto rights, board rights, and other "special" control rights held by the VC, the percentage of the VC's ownership share, the number of hours per month from syndicated VCs, the number of investment rounds, the number of investment months, the IPO and acquisition exit dummy variables, and the capital under management per VC fund managers. The following variables are used as instruments: the VC's ranking of project risk and entrepreneur experience, the log of the book value of the investment, the legality index of the country of the investment, a dummy for entrepreneurs in foreign countries, a late stage investment dummy, industry dummy variables, the limited partnership dummy variable for the VC, dummy variables for the investment and exit years, and the log of the MSCI returns over the period of the investment. White's (1980) HCCME is used. *, **, *** represent estimates significant at the 1%, 5%, and 10% levels, respectively.

Independent Variables	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	**3.22**	**4.27*****	0.26	0.25	1.88	1.14	-2.24	-0.72	3.31	1.19
Contractual Terms										
Convertible Security (H1)	0.49	0.74	0.40	0.61	0.13	0.20	-0.11	-0.19	-0.24	-0.41
Ownership % (H1)	-0.47	-0.22	-0.10	-0.04	1.30	0.63	0.09	0.04	-4.20	-1.18
Veto Rights (H3)	-	-	**2.92**	**3.44*****	**2.67**	**2.89*****	**3.80**	**3.67*****	3.28	1.54
Board Rights (H3)	-	-	-0.002	-1.02	-0.002	-0.93	**-0.007**	**-2.61****	**-0.006**	**-1.72***
Special Control Rights (H3)	-	-	-	-	-	-	-	-	4.42	0.99
Hours from Syndicated Partners (H4)	-	-	-	-	0.004	0.15	-0.01	-0.46	-0.03	-0.91
Investment Rounds	-	-	-	-	-	-	0.99	1.21	-1.19	-0.67
(Log of) Book Value	-	-	-	-	**-0.25**	**-1.71***	**-0.29**	**-1.95***	-0.13	-0.68
Project and Environment Related Risk										
Project Risk Ranking (H2)	-	-	1.66	1.26	**2.57**	**1.78***	**3.10**	**2.33****	2.74	1.58
Entrepreneur Experience Ranking (H2)	-	-	-	-	-	-	**0.27**	**2.07****	0.17	1.10
Late or Buyout Stage (H2)	**-0.92**	**-1.81***	**-1.55**	**-2.74*****	**-1.18**	**-1.90***	-0.48	-0.59	-1.85	-1.20
Medical / Biotechnology (H2)	-	-	-	-	-	-	0.32	0.33	-0.36	-0.28
Computer / Electronics (H2)	-	-	-	-	-	-	**0.93**	**1.73***	0.90	1.18
Communications / Internet (H2)	-	-	-	-	-	-	-0.68	-1.10	-0.86	-1.05*
Country Legality (H2)	-	-	-	-	-	-	-	-	0.42	1.21
Foreign Investment (H2)	-0.44	-0.60	0.13	0.20	0.20	0.34	0.45	0.78	-1.23	-0.82
Investment Performance Characteristics										
Investment Months	-	-	-	-	-	-	0.10	0.11	0.67	0.62
IPO Exit	-	-	-	-	-	-	**0.002**	**2.11****	**0.002**	**2.15****
Acquisition Exit	-	-	-	-	-	-	-	-	-	-
VC Fund Characteristics										
Limited Partnership VC	-0.52	-1.13	0.24	0.48	0.03	0.06	0.57	1.08	1.67	1.48
VC Portfolio Size / # of VC Managers	-0.11	-0.63	-0.21	-1.37	-0.25	-1.38	**-0.37**	**-1.76***	**-0.51**	**-2.17****
Number of Observations	74		74		74		74		74	
Adjusted R^2	-0.01		0.11		0.13		0.23		0.23	
LogLikelihood	-144.99		-138.52		-136.48		-127.21		-126.16	
Akaike Information Criterion	4.10		4.01		4.01		3.95		3.97	
F-statistic	0.79		1.96**		1.96**		2.24^{**8}		2.07**	

Table 8. Panel A. OLS and Ordered Logit Estimates of Disagreement

This table presents OLS and Ordered Logit estimates of the number of disagreements between the venture capitalist and the entrepreneurial firm. Independent variables include contractual terms (a dummy equal to one for convertible preferred equity investments, the percentage of the VC's ownership share, the fraction of veto rights, board rights, and other "special" control rights held by the VC, the number of hours per month from syndicated VCs, the number of investment rounds, and the log of the book value of the investment), project risk characteristics (the VC's ranking of project risk and entrepreneur experience, a late stage investment dummy, industry dummy variables, a dummy equal to one for entrepreneurs in foreign countries, and the legality index of the country of the investment), investment performance characteristics (the number of investment months and dummy variables equal to one for IPO and acquisition exits), and characteristics of the venture capital fund (a dummy equal to one for limited partnership VCs and the VC firm's capital under management per VC fund managers). White's (1980) HCCME is used. *, **, *** represent estimates significant at the 1%, 5%, and 10% levels, respectively.

Independent Variables	**OLS** Model (1)		**OLS** Model (2)		**OLS** Model (3)		**Ordered Logit** Model (4)		**Ordered Logit** Model (5)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	0.71	0.63	1.64	1.15	**7.75**	**2.72*****	3.67	1.50	**9.97**	**2.07****
Contractual Terms										
Convertible Security (H1)	-0.06	-0.17	0.07	0.21	0.31	1.01	0.03	0.40	0.36	0.48
Ownership % (H1)	1.21	1.20	1.18	1.26	**1.55**	**1.67***	3.14	1.14	**3.03**	**1.76***
Veto Rights (H3)	0.21	0.58	0.20	0.68	-0.42	-0.95	-0.12	-0.11	-0.93	-1.17
Board Rights (H3)	0.0008	0.14	0.0004	0.51	-	-	3.27	1.15	-	-
Special Control Rights (H3)	-	-	-0.75	-1.37	-	-	**-2.92**	**-1.75***	-	-
Hours from Syndicated Partners (H4)	**0.03**	**3.68*****	**0.04**	**4.93*****	**0.03**	**4.00*****	**0.09**	**2.24****	**0.06**	**2.40****
Investment Rounds	-	-	-0.07	-0.44	0.16	1.14	-0.42	-0.84	0.06	0.13
(Log of) Book Value	0.02	0.22	0.07	0.89	0.03	0.33	0.19	0.90	0.14	0.61
Project and Environment Related Risk										
Project Risk Ranking (H2)	-0.09	-0.11	0.33	0.40	0.41	0.49	0.73	0.20	0.34	0.14
Entrepreneur Experience Ranking (H2)	-	-	-0.09	-1.14	**-0.16**	**-1.83***	**-0.39**	**-1.81***	**-0.32**	**-1.84***
Late or Buyout Stage (H2)	**-0.83**	**-2.85*****	**-0.82**	**-2.32****	-0.34	-1.09	**-2.76**	**-2.46****	-1.30	-1.08
Medical / Biotechnology (H2)	-	-	**1.92**	**1.93***	1.15	1.43	1.93	1.45	1.10	0.93
Computer / Electronics (H2)	-	-	0.34	0.10	-0.33	-0.90	0.44	0.53	-0.06	-0.09
Communications / Internet (H2)	-	-	-0.27	-0.63	**-0.78**	**-1.80***	-1.05	-0.93	-1.29	-1.38
Country Legality (H2)	-	-	-	-	**-0.29**	**-3.10*****	-	-	**-0.40**	**-2.17****
Foreign Investment (H2)	0.26	0.74	0.38	0.93	0.48	1.19	0.81	0.75	0.78	0.86
Investment Performance Characteristics										
Investment Months	-	-	**-0.01**	**-1.87***	**-0.01**	**-1.87***	-0.04	-1.35	-0.02	-1.02
IPO Exit	-	-	-0.24	-0.79	-0.14	-0.28	0.16	0.19	0.81	0.90
Acquisition Exit	-	-	-	-	-0.02	-0.04	-	-	0.53	0.73
VC Fund Characteristics										
Limited Partnership VC	-0.15	-0.38	-0.15	-0.44	**-0.98**	**-2.24****	-0.53	-0.62	-1.23	-1.43
VC Portfolio Size / # of VC Managers	**-0.25**	**-2.77****	**-0.26**	**-2.97*****	**-0.18**	**-2.20****	**-0.79**	**-1.91***	-0.74	-1.55
Mu (1)							0.95	3.03***	0.84	2.74***
Mu (2)							1.30	2.41**	1.20	3.10***
Mu (3)							2.59	2.52**	2.60	3.09***
Mu (4)							3.69	2.78***	3.77	2.74***
Number of Observations	74		74		74		74		74	
Adjusted R^2	0.15		0.22		0.32		-		-	
LogLikelihood	-118.22		-109.90		-104.99		-55.11		-58.29	
Akaike Information Criterion	3.52		3.51		3.37		-		-	
F-statistic	2.20**		2.11***		2.81***		Chi-squared: 67.30***		Chi-squared: 60.94***	

Table 8. Panel B. 2SLS and Instrumental Variable Ordered Logit Estimates of Disagreement

This table presents 2SLS and IV Ordered Logit estimates of the number of disagreements between the VC and the entrepreneurial firm. Independent variables are as defined in Panel A with the exception of the following variables that are treated as potentially endogenous: the convertible preferred equity dummy, the fraction of veto, board, and other "special" control rights held by the VC, the VC's ownership share (%), the number of hours per month from syndicated VCs, the number of investment rounds and investment months, the IPO and acquisition exit dummy variables, and the capital under management per fund managers. The following variables are used as instruments: the VC's ranking of project risk and entrepreneur experience, the log of the book value of the investment, the legality index of the country of the investment, a dummy for entrepreneurs in foreign countries, a late stage investment dummy, industry dummy variables, the limited partnership dummy, dummy variables for the investment and exit years, and the log of the MSCI returns over the period of the investment. White's (1980) HCCME is used. *, **, *** represent estimates significant at the 1%, 5%, and 10% levels, respectively.

Independent Variables	**OLS** Model (1)		**OLS** Model (2)		**OLS** Model (3)		**Ordered Logit** Model (4)		**Ordered Logit** Model (5)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	1.34	0.85	**10.71**	**2.37****	**13.12**	**2.05****	**7.79**	**2.13****	11.75	1.28
Contractual Terms										
Convertible Security (H1)	-0.23	-0.51	0.47	1.17	0.51	1.17	0.20	0.15	-0.30	-0.22
Ownership % (H1)	1.66	1.04	-1.34	-0.62	0.75	0.25	-0.34	-0.06	4.16	0.48
Veto Rights (H3)	0.46	0.64	**-2.17**	**-1.68***	**-2.98**	**-1.83***	-2.57	-0.81	-2.70	-1.29
Board Rights (H3)	-0.002	-1.29	0.004	1.18	0.002	0.67	0.002	0.48	-	-
Special Control Rights (H3)	-	-	-	-	0.87	0.21	1.64	0.26	-	-
Hours from Syndicated Partners (H4)	0.007	0.22	0.03	1.30	0.03	0.96	0.02	0.44	0.03	0.83
Investment Rounds	-	-	**-2.99**	**-2.65*****	-2.08	-1.34	**-2.57**	**-2.38****	-0.29	-0.11
(Log of) Book Value	-0.05	-0.39	0.17	1.31	0.06	0.37	0.12	0.50	-0.03	-0.08
Project and Environment Related Risk										
Project Risk Ranking (H2)	0.71	0.64	-1.66	-1.06	-0.85	-0.38	-0.89	-0.40	0.18	0.06
Entrepreneur Experience Ranking (H2)	-	-	**-0.46**	**-2.44*****	**-0.40**	**-2.10****	**-0.39**	**-2.35****	**-0.27**	**-1.68***
Late or Buyout Stage (H2)	-0.86	-1.59	**-2.36**	**-2.91*****	-1.53	-1.22	**-2.15**	**-2.02****	-0.47	-0.20
Medical / Biotechnology (H2)	-	-	0.07	0.07	-0.14	-0.14	-0.08	-0.05	0.60	0.51
Computer / Electronics (H2)	-	-	-0.62	-1.16	-0.92	-1.45	-0.47	-0.41	-0.61	-0.48
Communications / Internet (H2)	-	-	**-1.06**	**-1.67***	**-1.27**	**-2.06****	-1.19	-0.81	-1.31	-1.13
Country Legality (H2)	-	-	-	-	-0.20	-0.71	-	-	-0.41	-0.70
Foreign Investment (H2)	0.67	1.42	-0.26	-0.51	-0.36	-0.30	-0.58	-0.25	0.85	0.55
Investment Performance Characteristics										
Investment Months	-	-	**1.65**	**2.28****	1.41	1.55	1.96	1.38	1.66	1.38
IPO Exit	-	-	0.0009	1.53	0.0009	1.56	0.43	0.52	0.65	0.76
Acquisition Exit	-	-	-	-	-	-	-	-		
VC Fund Characteristics										
Limited Partnership VC	-0.19	-0.38	-0.90	-1.63	-1.54	-1.45	-0.61	-0.82	-1.55	-0.71
VC Portfolio Size / # of VC Managers	**-0.44**	**-2.27****	-0.16	-0.91	-0.19	-0.74	-0.42	-1.05	-0.47	-1.17
Mu (1)							0.66	2.96***	0.67	3.05***
Mu (2)							0.95	3.42***	0.95	3.02***
Mu (3)							2.01	3.37***	2.07	3.40***
Mu (4)							2.98	2.35**	3.13	2.45**
Number of Observations	74		74		74		74		74	
Adjusted R^2	0.04		0.24		0.22		-		-	
LogLikelihood	-123.05		-109.60		-109.34		-69.62		-67.09	
Akaike Information Criterion	3.65		3.47		3.52		-		-	
F-statistic	1.24		2.31***		2.04		Chi-squared: 38.28***		Chi-squared: 43.35***	