Watching the Shop from the Front Seat:

Determinants of Venture Capitalists' Representation on the Board*

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Abstract

Oversight and involvement are essential for a venture capital firm to influence the destiny of the portfolio company. This paper focuses primarily on the venture capital firm's decision to take a formal responsibility through joining the board. Our study uses a large sample of private British companies that received institutional investment between 1999 and 2002. We examine the determinants of board composition and board size. Contrary to common belief, only 30% of the companies have any institutional investor (a "VC") on board. The decision to take a formal board seat is based on the ability to make a contribution: specifically, on the stage of the portfolio firm, the industry fit between the investment and the venture capital firm, and the overall experience of the latter. Two aspects of British venture capital firms inhibit their role in governance. First, firms that are organised as a public corporation (and not as a partnership) refrain from undertaking a formal board responsibility. Second, some of the more established institutions are organised around branches. We find that the VC firms with branches are less involved with board membership. Finally, we report (but are helpless to rationalize) a sheer number of cases in which a VC firm is represented on the board yet did not invest in the firm.

I.   Introduction

For several decades, technology has been by far the fastest growing sector of the economy and at the forefront at changing the way we conduct business and live our life. The venture capital (VC) industry has played a major role in nurturing and developing a disproportionate share of technology commercialization and as a spawning ground for technology entrepreneurs (Gompers, Lerner and Scharfstein (2003)). From its inception days in Silicon Valley in the 1960s, the VC industry has grown to be a global phenomenon with over $100 billion in invested capital in 2003 across all stages of corporate lifecycle, of which $33 billion is in early stage investments (PricewaterhouseCoopers and Venture Expert (2004)).[1]

In addition to enhancing economic growth, the venture capital phenomenon is interesting from an industrial organizational perspective (Hart (2001)). In contrast to other financial intermediaries, the VC firm takes an active role in the development of the invested firm (Sahlman (1990)). In addition to providing funding, venture capitalists serve their portfolio firms through coaching and guidance, networking for strategic alliances, and attracting further capital (Bygrave and Timmons (1992)). Hellmann and Puri (2002) empirically confirm that the in-kind services of venture capitalists are of economic significance, through a reduction in time to bring a product to market and by professionalizing the start-up company to achieve organizational milestones such as building a management team. Information gathering and monitoring is the other key role played by the VC firms. Theories of financial intermediaries have focused on the information role of these institutions to alleviate problems of moral hazard or adverse selection (Fama (1985), Stiglitz (1985)). In a comprehensive study, Kaplan and Strömberg (2003) document features of venture

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[1] In Europe alone, private equity funds raised over $40 billion of new dry powder during 2003 (UBS Private Equity Funds Group, 2004).

capital contracts and show their function in mitigating information asymmetry between the entrepreneur and the investors.[2]

A key to our current scope of VC involvement is the question why investment and advice role should be bundled. Put another way, why cannot the entrepreneurs use purely paid business consultants and opt instead to use venture capital, especially when the entrepreneurs have to cede control and equity rights to attract the VCs. The rationale for partnering with the venture capitalist is analyzed by Casamatta (2003). Under a wealth constraint and costly unverifiable effort, it is not optimal for the entrepreneur to hire a consultant separate from obtaining the financing.

In this paper we empirically examine the oversight role played by the venture capital firm in a sample of 998 British private companies that received venture capital investment from 1999 to 2002. It is hard to statistically gauge the effort and involvement of venture capital firms in their portfolio companies.[3] A tangible measure to empirically capture the monitoring and involvement of venture capitalists is board membership (Hellmann (1998)). Kaplan and Stromberg (2003) show that control rights are a critical part of venture capital contracts. Board rights give the VC a regular access to information and ongoing governance over the managerial decision-making.[4] The importance of control in VC investments has also been shown in several other studies. Lerner (1995) posits that the need for control increases when there is uncertainty or turmoil in the invested firm; and selects CEO turnover as an event that captures uncertainty in the portfolio firm. Lerner shows that the venture capital board

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[2] From an analytical perspective, Repullo and Suarez (1998) and Schmidt (2003) model the advisory role of the venture capitalists which gives rise to features in convertible securities used in venture capital financing. Cornelli and Yosha (2003) show that the use of convertible securities mitigates the incentive of entrepreneurs to engage in window dressing practices. Cuny and Talmor (2004) analyze forms of stage financing in venture capital contracts under dual moral hazard and heterogeneous expectations.

[3] An obvious issue with surveys is that responses may only reflect the latest period or be influenced by recent specific events or the lack of them. Also, a survey is at best correct on average across the entire portfolio firms, without a meaningful differentiation across the portfolio firms.

[4] For a practitioner's view on the role of board members in venture backed companies, and a comparison to their role in public companies, see Gupta (2004).

membership increases at CEO turnover in line with the prediction on the need for monitoring. Using a sample of IPO firms, Baker and Gompers (2001) argue that the VCs shift the board composition away from insiders so as to protect the interests of new investors. Compared to other firms at the time of IPO, VC backed firms have less insider controlled boards.

Given the need for combining advice, monitoring, and investment role we first ask which firms are empirically more likely to have investors as board members. Since oversight is a costly activity for the venture capitalists, it should be positively related to the financial stake. As in Kaplan and Stromberg (2003), we hypothesize therefore that where the VC investment is relatively low, the entrepreneur has more control as compared to situations where the VC investment input is higher. Second, the role of financial advice and help in recruiting key personnel is more important in early stage of the venture (Hellmann and Puri (2003)). Correspondingly, the value that the portfolio firm receives from the VC experience and advice is more significant in case of an early stage venture. We conjecture, therefore, that VCs are more likely to assume board positions in early stage companies relative to late stage investments. Third, the benefit from the VC advisory role depends on the existing skill set of the entrepreneur. The lack of business acumen on part of the entrepreneur would require a deeper involvement. Hence, it is plausible to expect that in certain industries, especially science based, venture capitalists would have a higher board representation.

Because of their non-monetary role, it would not be correct to treat the venture capital community uniformly and to focus exclusively on the characteristics of invested firm. It is possible to alleviate the cost of oversight through a mutually beneficial matching process between the venture capitalists and entrepreneurs. Lerner (1995) finds that geographically proximate VCs are more likely to assume a board membership. Hsu (2004) shows that there is a clear eagerness among new ventures to

affiliate themselves with high reputation investors, which translates into monetary terms. High reputation VCs are able to invest at a 10-14% discount. If indeed entrepreneurs value costly effort (service) by VCs then it follows that there may be some selection mechanism by the entrepreneurs based on the expected ability of VCs to contribute valuable services. Another research question of this paper, therefore, is which VC firm is selected, and in what situation to have a board representation. We posit that VCs with prior experience are preferred (Sorenson and Stuart (2001), Hsu (2004)) and that the likelihood of a particular VC to monitor is linked to the fit between the expertise of the VC firm and the needs of the invested firm.

Kaplan and Stromberg (2003) find that an average board size of a portfolio company has 6 members, of which 2.4 are venture capitalists or their representatives. Baker and Gompers (2001) report an average of 1.73 VCs per board at the later time when the venture-backed firm goes public. This led us to presume that nearly all venture-backed firms have one or more VCs on their board. At least for our sample of UK firms, this is far from being the case. We find that only 30% of the companies have any institutional investor on board. Two aspects of British venture capital firms inhibit their role in governance. First, firms that are organised as a public corporation (and not as a partnership) refrain from undertaking a formal board responsibility. Second, some of the more established institutions are organised around branches. We find that the VC firms with branches are less involved with board membership.

Our research is concerned with board structure and the decision to join the board at the first time the particular institution invested in the venture. In contrast, prior research has focused on board structure at initial public offering (Bakers and Gompers, 2001), or post IPO (Hochberg, 2003). Since the majority of invested firms never reach a public offering, it limits the sample to very successful firms and so is subjected to a survivorship bias. Second, as we pointed out earlier, prior research

treated institutional investors homogenously when examining their board participation (Lerner (1995) and Gompers (1995)). We consider industry and other expertise in assessing the benefit of services rendered by the venture capitalists. Third, prior research has examined the case of venture deals. We include in the sample both venture (start-ups) and late stage (buyout) investments. This allows us to capture the variance in need for oversight and advice across the firm life cycle. In addition, we document a very different pattern in the transition in board composition from the time before to the time subsequent to the investment round.

We also provide descriptive information on the board structure, size and mix. This is relevant in the wider context of corporate governance. The general literature on the subject has not been able to reach an unequivocal conclusion on the role and impact of outside directors (Bhagat and Black (1998)). Much has been written in both the popular press and in academic literature on the limited role of outside directors (e.g., Hermalin and Weisbach (1998)). We provide systematic empirical evidence from private venture-backed firms in U.K. that expand our knowledge of governance beyond that in public corporations. Since oversight is a heavy burden, it need not be carried out by every participating institutional investor.[5] Therefore, it is imperative to consider the possible consequences of round syndication, as well situations where there is already an institutional investor on board when a new VC firm decides to in the venture company. We develop the notion of VC quasi affiliates and consider their role in monitoring and advising. Finally, we document a significant proportion of cases in which a VC firm is represented on the board yet did not invest in the firm. In light of the heavy cost in monitoring, this result is a puzzle to us.

The remainder of the paper is organised as follow. Section 2 describes the data collection and construction. It also defines the variables of board composition.

Finally, it defines the variables and their construction for company, round and institution characteristics. Section 3 analyzes the determinants of board size and board mix of insider and institutional investors. Section 4 analyzes the choice by investor to utilize resources and take a formal board representation as a function of fit between the investors and the portfolio company. Section 5 concludes.

2.   Description of data and board structure

2.1   Sample collection and construction

Private corporations in U.K. are subject to filing and disclosure that is far more extensive than in the Unites States. The UK offers therefore a rich environment to study the governance of private firms. For this study, data was gathered from two primary sources. The first source, VentureXpert provides information on private firms that received funding from institutions and identifies these investors.[6] The second source, FAME Information Services Database, collects filings from the Company House (U.K. regulatory authority). Pertinent to this study is complete information on individual board members that allows us to match it with VentureExpert data on the universe of venture capital partners and associates.[7] Coverage of the U.K. private company board information by Fame is partial before 1998, and therefore the sample period for this study was selected to be from 1999 to 2002. During the four years, there were 2,093 firms receiving institutional financing. We only considered entities that were registered as companies and dropped partnerships, sole traders and other non-company form of entities. This left us with 1,014 registered companies that

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[5] It is commonly believed that venture capitalists spend about 40% of their time in monitoring portfolio firms (Sahlman (1990)).

[6] We use the terminology of institutional investors to allow for both components of institutional private equity – venture capital and buyout firms.

[7] Specifically, directorship information in FAME includes name, appointment date, resignation date, address, date of birth, and other board seats held in the past five years.

received institutional financing in the sample period.[8] Further 16 cases were dropped because of for lack of sufficient information on board membership, resulting in a final sample of 998 firms. The funding in our sample was provided by a total of 213 institutions, each doing between 1 and 163 investments.

Venture capital is commonly placed through multiple rounds of investments. Individual financing rounds are documented by VentureXpert but they do not seem to carry equal weight for the purpose of corporate governance. This study is concerned only with board structure at the time when the VC firm made its investment in the firm for the first time. We capture the board structure prior, changes, and post the first time a firm receives investment in our sample period. Clearly, this need not be the first round of institutional money for the venture firm. Another consideration is that private equity investments are often syndicated, i.e., have more than one investor in the financing round. The presence of multiple investors in a round results in the 1220 unique pairings of investors and invested firm dyads. The dyads consist of investors who invest in a firm for the first time in the sample period. To track board evolution around the time of investment, we are concerned with board structure both the number of directors and the nature of the change. We thus employ four measures: *prior, additions, subtractions*, and *post round*. Directors appointed within three months after the financing round date are treated as *additions*. The three-month period also takes care of the over statement of rounds or spurious rounds (Lerner and Gompers, 1999). In addition, there are cases where the funding may have been contingent upon appointment to the board, and so we also treat as additions cases where the directors were appointed within 60 days prior to the completion of the financing round. Directors removed during three months before or after the round are treated as *subtractions*. Any director who is appointed within three months prior to the round

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[8] In the subsequent analysis we run a sensitivity check to ensure that the firms excluded from our

date and has not been removed within three months of the round is treated as part of the *prior* structure. Any prior director who has not been removed or any new additions are part of *post round* board structure.[9] In other cases where the firm was registered as a limited company subsequent to the receiving institutional financing we take the first board as the post round board. All other directors who are appointed well before the round date and continue past three months of the round are treated as part of pre and post round board structure

Directors are coded into three primary categories common in the corporate governance literature: *Insider*, *Quasi Insiders* and *Outsiders* (e.g., Baysinger and Butler, 1985). *Insiders* are employees of the firm, *quasi insiders* (also known as "grey") have an ongoing relationship with the firm but do not work for it full time, such as lawyers or accountants. *Outsiders* include investors (institutional directors), angles, others, and affiliated directors. *Institutional* directors are identified if they meet both the criteria: i) self-declaration of the director as an institutional investor, and ii) our matching of the last and first names with the VentureXpert list of employees of the institutional investors. Directors are classified as *Angles* if they meet one of the two criteria: i) based on self-declaration by the board member as a VC or an investment manager, where such a person is not employed by one of the institutional investor; or ii) board membership of two or more firms receiving investment in our sample and not classified as an *insider*, *quasi-insider*, or *institutional* director. The next group, *Affiliates,* are directors who are not employees of, but are assumed to be closely related to one of the institutional investors who have invested in the round. These are business professional, scientists or industry experts who are viewed trustworthy by the institutional investor to qualify and oversee the

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sample are not due to systematic reasons that may bias our results.
[9] Several firms in the sample were incorporated only after receiving institutional financing. For such firms the first board structure is classified as post round structure.

portfolio company on their behalf. We categorize individuals as such if they sit on board of at least two firms receiving investment from the same institutional investor. The final category of outside directors is *Others* which includes the remaining directors who are not classified as either *Insider*, *Quasi Insiders* or *Outsiders*. It should be noted that for about 15% of the directors there was insufficient information to ascertain their exact classification. They do not classify themselves as angels or investors and based on the register of the employees of the global venture capital community they were not *institutional investors* either (and obviously not *Quasi Insiders)*. We assumed them to be insiders.[10]

2.2   Board composition

Table 1 provides aggregate statistics on board membership at the time of institutional investment. Panel A is the total count of directors at prior, additions, subtraction, and post round board by class of association. Data is presented separately by the stage of the firm. We make a distinction between a venture deal and a buyout. An invested firm is classified as a venture deal if it involves a seed start-up, early stage, expansion or mezzanine VC financing (constitutes 62 percent of the sample). The firm is classified as buyout for a mature company, usually in need for a turnaround or expansion (the remaining 38 percent of the sample). Panel A1 presented the count of directors for the 617 venture investments, whereas Panel A2 summarizes the data for the 381 buyout deals in the sample. The total count of directors is divided in Panel B by the number of invested firms in each category to arrive at the mean number of board members per company.

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[10] We repeated the tests in the study by treating the persons whose association and occupation are unknown as a separate category. The results (not reported) are found not to be qualitatively different.

We observe an overall 43% increase in the board size around the time of the investment (from a total of 3911 to 5585 directors). For venture deals the average board size increases from 4.23 to nearly 6 seats. However the majority of the increase is in the insider category (nearly four seats) and in quasi insiders (.88). Only 249 institutional investors occupy a board seat post round, for an average of 0.4 directorship seats. Affiliated outsiders only add 0.06 to this figure. A particularly peculiar phenomenon is that 41 institutional investors sit on boards yet do not invest in the companies (nor do so subsequently in the sample period). When compared to 249 institutional directors who invested, this is a very large number, which raises the question: are the VC employees in U.K. firms making optimal use of their time and effort?

The average board size (5.94) of a venture firm in our study compares very well with previous literature using US data. Baker and Gompers (2002) find an average board size of 6.21 for their sample of IPO firms. Hochberg (2003) reports an average of 6.08 directors in a sample of post IPO venture firms. Finally, Lerner (1995) reports for biotech firms a board size 4.1 to 5.7 depending on the round. On the other hand, our findings of VC board representation compared very poorly with the results from the studies in U.S. Even with non-investing VCs and VC affiliates the UK average figure only increases to 0.53 seats post round. By contrast, Lerner (1995) reports an average of 1.4 board seats at time of first round and 2.12 in later round per invested firm. Hochberg (2003) finds the average board representation to be 1.64 and Baker and Gompers (2002) report 1.73 VC directors per board. In the sections below we discuss some of the causes for the low board membership by U.K. institutional investors.

Now consider buyout deals, the average board size prior and post round is nearly a full person smaller than the respective figures for venture deals. Institutions comprise an even smaller percentage of the board (only .22 seats on average post investment). However, we notice an addition of 2.22 insiders to the board. By the nature of investment in turnaround situations, these new insiders must by appointed by the new investors or with the consent of new investors. In addition to a board seat these executives also take an active position with the company, appear on the payroll and therefore being classified as insiders.

It is also of interest to analyze the subtractions from the board. 186 insiders are removed from the board in traditional VC deals (which amount to 10% of their pre-board number), whereas 329 (or over 30%) insiders are subtracted in a buyout. In addition, the majority of the quasi insiders are also replaced (60%). This result highlights the core difference between a buyout transaction and a venture deal. Buyouts are built around a radical change in the acquired firm, which typically involves a sweeping removal of many of the old guard. In contrast, retaining the intellectual property is crucial in venture investments and the nature of the transition to professionalize the company is done in a cooperative and progressive way.

2.3   Company, round and institution characteristics

In analyzing the determinants of board structure, we are concerned with three classes of variables: characteristics of the invested firm, the type of round, and the characteristics of the institutional investor. In what follows we define the main variables and the way they are computed.

In line with the discussion above, we make a distinction between a traditional venture deal and a buyout transaction. *Venture Deal* is an indicator variable to capture this categorization. Companies are also characterized based on their industry focus.

We employ the 3-catogery coding used by Venture Expert: biotechnology, information technology (such as hardware, software, chips, telecommunication, internet) and traditional industries (service, retail, automotive, etc.). Our sample consists of 128 biotechnology companies, 432 in information technology and the remaining 438 are classified as traditional industries. In the empirical analysis we use traditional industry as the comparison category against *Biotechnology* and *Information Technology firms*.

Rounds are classified based on four parameters. *RdNUM* is the count of the number of times the invested firm received institutional financing. For example, a count of 2 means that although the specific observation is the first time for the institution to invest in the firm, the latter has already received one previous round of institutional funding. *RD Synd* is an indicator variable if there are more than one institutional investor in the round. *RD INVS* denotes the actual number of institutional investors in the round. Finally, *Rd Amt* is the total U.S. dollar amount in millions invested by all the participants in the round. This figure is viewed as sensitive by institutions and so it is not always disclosed. The total round amount per se is of little interest; as the more relevant variable is the level of commitment by the specific institution. Since this is confidential information, we assumed that all the institutions in the round participated equally. Accordingly, *Rd Amt* is normalized by dividing by the number of investors in the round. To further scale this variable we must incorporate the fact that the absolute level of investment can only be judged in relation to the size of other investments. We compute the average amount invested per investor across all deals in the sample and classify each deal whether it is above or below the median. This results in a 3-category indicator variable: round investment per participant that is above the median value, below the median value, and where no information on round amount is available.

We are next concerned with the experience of the institutional investor and its fit with the portfolio company.[11] Experience and oversight capability is measured in three ways. First there is the overall experience of the venture capitalist. Venture capitalists develop relationships with other institutions, bankers, and business professionals to build a network and gain experience that are invaluable in their oversight of the firm. Lerner (1995) finds that a more experienced investor among the syndicate (measured by age) is more likely to be nominated to the board. We view *Experience* to be related to deal intensity and therefore measure it by the accumulated number of U.K. investments made by the institution prior to the current quarter where the investment is made. Second, there is a need to account for experience in the sector. The more deals done by the VC firm in the industry, the more capable it is to deploy relevant resources, exert judgment that is less dependent on external opinions. Institutions with such *Specific Experience* ought to be valued higher than that of other institutional investors. We define *Specific Experience* as the number of prior U.K. deals by the investor in the industry of the portfolio company. We use the 3-catogery-industry sector coding above: biotechnology, information technology, and traditional industries to determine the *Specific Experience*. The third variable in the group relates to the focus of the venture capital. A large VC firm has more partners and makes more deal. On one dimension it is likely to have more industry-specific know-how in house (which is captured by the *Specific Experience*). However, due to its sheer scale it is not sure that the in-house resources be allocated to the specific invested firm. To adjust for that, we need to identify if the VC has an industry focus in the area of the invested firm. Accordingly, *Industry distance* is an inverse measures the fit between the institutional investor and the invested firm on the industry dimension. It is the

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[11] For a comprehensive discussion of these experience measures variables, see Sorensen and Stuart (2001).

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percentage of previous investments by the institutions in industries other than that of the target.

Finally, we are interested in the organizational form of the VC firm. Organizational form may affect monitoring in two possible ways. First, VC firms in the US are organized as partnerships. In Europe, some of the more established VC firms are organized as corporations, and may even be quoted on the stock exchange (e.g., 3i Group Plc in the U.K., GIMV in Belgium). Institutions that are incorporated may be hesitant to join the board of invested firms as it is viewed as control and could trigger consolidation of the invested firm in the financial statements of the institutional investor. Given the negative operational cash flow pattern in the early years of the investment, a consolidation is not viewed favourably. Also, as startups are destined to fail much more often than other companies, this may open creditors of the venture to sue the investors if act as formal directors.[12] *PLC* is an indicator variable that is coded as "1" if the investor is organized as a Public Limited Company under the U.K. Companies Act.

The last variable is *Branches*, which counts the number of non-head office branches an investor has in U.K. Past research has shown that the venture capital firms invest primarily in geographically proximate firms.[13] John Doerr, the legendary partner of Kleiner Perkins is quoted to say: "you have to be able to drive to the deal." There has also been anecdotal evidence that VC firms have asked early stage start-up to move offices close to the VC office, to enable a close oversight and intricate

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[12] 3i Group PLC, which is largest investor in our sample, claims that, lacking the protection of a limited partnership, it may be open to lawsuits as viewed by creditors to have "deep pockets" (Hardymon, Lerner, and Leamon (2003)).

[13] Sahlman (1990), Bygrave and Timmons (1992), Lerner (1995) and Sorenson and Stuart (2001).

relations. We suggest that branches allow investors to monitor and provide advice to the invested firms[14].

[Insert Table 2 about here]

Table 2 provides descriptive statistics for the round type and the profile of the institutional investor. Mean round number is 1.16 indicating that for the majority of the cases the current investment is the first time. Precisely 50% of the deals are syndicated. The average number of investors is 2.14 (and goes as high as 12). Median amount of investment in a given round is $5 million dollar, but this figure is highly skewed. As for experience, the median of prior U.K. deals for an institution is 17. This figure ranges from a single deal (the current one) to 428 transactions for 3i. Median number of deals in the sector is 9, and again this figure is highly skewed for the large investors. Average industry distance is 0.38, suggesting that on more often than not there is an industry concentration in the deal selection. Finally, for the organizational structure, 22% of the deals come from *PLC*s. As for *branches*, the mean number is 2.41 (plus headquarters) topped by 3i with 9 branches.[15]

3.   Determinants of board structure

In this section we study the board structure by looking at contextual features like stage of the invested firm, industry classification, and the attributes of the financial round. We are interested to know which of these characteristics affect board size and the mix of insider versus outside institutional directors. The latter is important, as it becomes a component in the distribution of control.

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[14] A more accurate measure of such function of control and advice by branches would be to measure the geographical distance between the nearest office of the investor and the invested firms office. We treat branches as a proxy.

3.1   Determinants of Board Size

The optimal board size has been subject to ongoing debate in the literature. Although a large board can bring vast experience to the table, it is likely to suffer from coordination problems and hence not function well. A board of seven to nine directors has been suggested as an optimal (Bhagat and Black (2001)). Direct findings on the relationship between board size and performance are not conclusive. In terms of relevance to the current study, most of the studies on board size are conducted on large public companies, with a median board size of 11 directors. An exception is Eisenberg et. al. (1998), who study the relationship between board and performance for a sample of 879 midsize Finnish firms, where the median board size is 3 members. They report a negative correlation between board size and performance. A point of consensus in literature is that board size is actually an endogenous variable and is influenced by company characteristics such as firm size, ownership structure and the type of industry.

We attempt to determine factors that influence the size of the board of firms receiving private institutional equity. Company and round characteristics are utilized as explanatory variables. The company characteristics we utilize are the two industry indicator variables, and the indicator variable whether this is a venture deal or a buyout. For the round characteristics we incorporate all the five variables that were discussed above. For the integer variables – round number and number of investors in the round, we use a natural log transformation. Finally, we incorporate year indicators to capture possible year fixed effects.   We run an OLS regression on board size, the result of which are reported in Table 3, Panel A. Since the dependent variable, Board Size, is a count variable that is not normally distributed, we run a Poisson regression,

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[15] Large institutions with branches are represented more often in the sample. Since the median number of branches across all transactions is one, the average number of branches across the 213 institutional investors in the sample is clearly less than one.

which we report in Panel B of the table. The results are consistent across the two models.

[Insert Table 3 about here]

We hypothesize *ceteris paribus* that firms in a venture stage have greater need for monitoring and advice (Hellmann and Puri (2002)) the entrepreneur and the institutional investors will prefer a higher board size. We find that the *Venture Deal* indicator has a relative high and significant coefficient (0.825), indicating that venture deals on average have nearly a director more than buyout deals.[16] We also find that the biotechnology industry is more likely to have a nearly one board member more than a traditional industry. In line with Casamatta (2003), our conjecture that oversight is related to the financial stake is borne out by the data through the variables two RD_AMT variables and by the investment round (*RDNum*). When the investment is above the median it tends to add one more board members as compared to one that is below the median. Similarly as the number of institutional financing rounds progresses, valuation is typically increased and so the number of board members. Finally the presence of more than one investor *(RD Synd)* also leads to larger boards as investors are driven to monitor. No support is only found for the count of investors (*RD INVS*).

3.2   Board Composition

We next turn to examine the board mix, in particular corporate insiders and institutional investors. The independence of the board from the insiders is viewed as the first line of defence in protecting shareholder interest and as a key driver of performance. However data and arguments have been mainly concerned with publicly

traded companies, for which individual shareholders are assumed to be largely uninvolved and in need for protection. The situation in private firms is dramatically different for the following reasons:

a. Board control is only one of several instruments that external investors have to exert discipline on management. As is documented by Kaplan and Stromberg (2003), in venture backed firms voting rights and board seats are two distinct mechanisms. Much of the term sheet involves stipulations and milestones that allow external investors to intervene in numerous situations (in particular, when the invested company is not performing well).

b. Venture backed companies are dependent on the institutional investors to facilitate the next round of financing, which acts as an implicit whip in the boardroom.

c. Unlike in most public corporations, insiders in venture companies have a higher stake, either through their initial ownership position as founders or through generous executive option schemes. This makes founders in particular less prone to entrenchment compared to executives in a public corporation.

d. As discussed extensively in Section I, institutional board members of a venture firm are more typically more heavily engaged than their counterparts on public corporate boards. Monitoring is only one of several functions that they serve.

For all the reasons above, a direct comparison of private to public board structures could be misleading. In benchmarking our findings, therefore, we will concentrate on the (sparse) corporate government literature in venture capital.

As shown in Table 1 insiders account for 67% of all board members in venture stage firms and 80% of all board members in buyout stage firms. Even aside of the quasi insiders, it indicates that insiders dominate the board in our sample. In line with

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[16] Unlike the OLS coefficient that is the marginal effect of increase of one unit in the dependent variable, the Poisson coefficient measures the log odd change.

the discussion above, we speculate two main reasons. First, insider directors have a larger ownership stake – either in the capacity of founders in venture companies or if the deal is a management buyout. Second, in other buyout deals it is often the case that the institutional investor appoint an experienced professional to run the company on their behalf and to execute a turnaround or an expansion plan. Such an appointment is usually supplemented with a board seat and at times even the chairmanship.

Other studies of board structure in private firms were mainly concerned with successful late stage U.S. ventures around an IPO. Hochberg (2003) finds that on average insiders make 42% of the directors. We note that most of our data refers the first round of institutional investment. Thus the difference is likely to be attributed to the company stage and the subsequent rounds financing until a successful IPO. In the process outsiders gain more seats on the board. Even if insiders keep their existing seats, percentage-wise they get diluted not only in equity but also in the boardroom.

We next turn to explore the determinants of board mix post the financing round. Hermalin and Weisbach (1998) suggest that the board composition is an outcome of the bargaining process between insiders (CEO) and outsiders based on the relative power of the different parties.[17] We consider several contextual variables that could affect the mix of insiders and institutional investors on the board. The same variables are used as the ones to explain board size in Table 3. As there, we include fixed effects to capture any unobserved year effects. The proportion of insider directors and VC directors are regressed and reported in Panels A and B of Table 4, respectively. Since the dependent variable is bounded in the range [0,1], we also estimate a logistic regression (unreported), in which the direction and significance are qualitatively the same.

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[17] Tenure of the CEO increases the CEO power in board appointments.

Casamatta (2003) argues that insiders of early stage firms have to give up control to attract investors who can provide oversight. In line with her proposition, we find that *Venture_Deal* is significantly negatively related to insider proportion. In the board size estimation (Table 3) *Venture_Deal* was positively correlated with board size, implying a tendency to increase the board by adding experienced professionals. Similarly, firms that receive a large inflow of capital (*RD_AMT* higher that the median amount) have a lower insider ratio post round. Finally, Kaplan and Stromberg (2003) have suggested that in an industry where greater fixed investments are made or where entrepreneurial talent is specific there is more need for outsider oversight. This is particularly relevant in *biotechnology* as scientists most often have a very low base of commercial skills. We find that the ratio of insider is significantly negative in the biotechnology industry when compared to traditional industries.

In *Panel B*, we analyze the determinants of the proportion of institutional directors. It is not very surprising that the results are consistent with *Panel A* pertaining insiders. We find that *Venture Deals* have a higher mix of institutional board members. Also, as the number of rounds progresses *(RDNum),* the proportion of institutional board members increases; and finally, the institutional board membership is also higher in case of *biotechnology* as scientists or physicians may lack business acumen.

4.   Determinants of institutional board representation

As outlined in Section 1, studies on the board structure of US venture backed report an average of two VC investors on the board of each of their portfolio companies -- either directly or through syndicate partners. For the U.K. we have shown that institutional investors are not represented on majority of the investments. Figure I

summarizes the statistics. Out of the total 998 UK firms, only 299 have any institutional representation on their board. Of which, 33 invested firms have institutional employees of firms that never invests. Hence, only 27% of the portfolio companies are manned by the investing institutions. When adding the 35 boards occupied by outsider affiliates, this figure only grows to 34%. As for the remaining venture backed companies, 10% have an angel on their board, and the vast majority (56%) are housed by insiders and non-professional investors.

[Insert Figure I about here]

The statistics displayed in Figure I raises several queries. For the institutional investors, how are they picking on which of their portfolio companies to server on board and why? We seek to explain the decision of the VC firm to serve on boards of portfolio companies first based on the needs of the latter company. We conjecture that an early stage company is in need for more oversight. The variable *Early stage* is an indicator that takes the value of 1 when the stage of the invested firm at the round date is either "early stage" or "start-up/seed". Second, we account for the outlay of resources by the investors in terms of capital invested (*RD AMT)*, and the size of the potential stake (proxied by the round number (*RdNum).* Since monitoring is presumed to be rather costly, we are also interested in the impact of round syndication, and whether it alleviates the burden by sharing the oversight. Two variables account for that: an indicator variable in case of a syndicated round (*RD Synd*), and the number of round participates (*RD INVS).*

Just as the institutional investor decides to allocate costly time and effort to some investments, the firm that raises the fund may also be seeking institutional investors with the best ability to serve its needs. It is of mutual interest therefore for both the investor and firm to maximize their fit. We account for general experience

and fit between the institutional investors and the portfolio company through the variables *Experience*, *Specific Experience*, and the *Industry Distance* between the invested firm and the investor's entire portfolio.

Table 5 provides clues to the VC allocation of time and effort and the fit between the ability of the investor and needs of the invested firm. We estimate a Probit model on the likelihood that the investor will serve on board of the invested firm. When deploying the statistical procedures, we account that we have started with a population 2,093 firm receiving investment and end with a sample of 998 firms. Sample selection may bias our results and therefore we use the two-stage Heckman (1979) sample selection correction. Also, the number of investments per investor ranges in our sample between 1 to 163 investments. Sampling the same investor multiple times results in non-independent observations. To control for this, we use the cluster option in STAT 8.0 by grouping on the investor.[18]

[Insert Table 5 about here]

Table 5 supports the hypothesis that an institutional investor is more likely to serve on board of an early stage venture (*Early Stage* deal provides a nearly 10% increase in the marginal probability). They are also more likely to serve on board if the amount invested is above the median amount. In terms of round characteristics, we observe no statistically significant effects.

We turn next to experience and fit. More experienced investors are more likely to serve on board. On the other hand, we find the level of S*pecific Experience* to be negatively correlated to board membership, which is not intuitive. As to the fit

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[18] Using investor fixed effects would have controlled for any unobserved time invariant factors that may influence the decision to monitor. In an unreported analysis we model the proportion of portfolio firms in which the VC servers on board using investors fixed effects and find the results to be similar.

between the VC and the needs of the firm, it is reassuring to find out that investors are unlikely to monitor firms that are distant from their prior expertise.

Over the course of this study we have come across two interesting variables that seem to have an influence on an investor choice to serve on board. First is the organizational form. Most of the venture capital firms in U.S. are structured as limited partnerships. In contrast, some of the more established and rather active U.K. institutional investors are organized as public limited companies. Most notably, 3i Group PLC is the single largest investor in our sample (see Figure II for key highlights). As discussed above, members of a PLC form of institutional investors may be less likely to serve on board due to consolidation and litigation concerns. In Table 5 we find the main effect of *PLC* negative but not statistically significant. However we show below that there is a significant interaction between *branches* and *PLC* when explaining board participation.

[Insert Figure 2 about here]

The second variable is the prevalence of branches for the institutional investors in U.K.; studies confirmed that venture capital investment in the U.S. is highly localized in terms of geography and industry distance.[19] There is high concentration in a few areas in the East and West Coast of U.S. due to the geographical constraints the VCs place on their investments. In the last decade, venture capital activity has spread to many other parts of the U.S. Nevertheless VC firms refrain from operating through branches. They prefer partnering through syndication of investments, which allows them to expand their network both in geography and by industry. In U.K. despite the fact that the geographically dispersion is much smaller that the continental U.S., we observe that a significant number of the

institutional investors have branches. A reading of the history of the institutional investors reveals that the firms are founded as quasi government agency with a mandate that may include balanced regional development (3i group Plc for example). In other cases firms are associated with established commercial and investment-banking that operate through branches. We expect that these branches serve as a proxy for the distance and monitoring capability of the institutional investor. This is supported by Table 5. Institutional investors with branches are less likely to serve on boards and investors who are both PLC and have branches are further unlikely to serve on board.

5. Conclusion

Theory and empirical evidence of venture capital investment in the U.S. has lead one to assume that private equity investors serve on boards of their entire portfolio companies either directly or through syndicate partners. We have presented evidence in the U.K. context to show that is not the case. Since time is considered the binding constraint of venture capitalists, its allocation on advice and oversight across the portfolio firms is very important. We find that the institutional investors choose to serve on boards of invested firms where they add most value in early stage and when the entrepreneurs are less likely to have business acumen (e.g., in the biotechnology industry). The institutional investors are also more likely to serve on boards where they have a high financial stake. The more experienced the investor the more likely that he/she will serve on board of the invested firm. While these results are sensible, we cannot easily square it with the sheer number of institutional investors who sit on boards of companies they did not invest in (nor do so later).

[19] Bygrave (1987), Lerner (1995), Sorenson and Stuart (2001).

More generally, exerting oversight over portfolio companies may take several forms: through active participation such as through a committing directorship position, through the institutional branches through affiliated professionals and through syndication. This study explicitly considers all the four mechanisms. The study examines the rather European feature of the U.K. institutional investing, i.e. the number of branches and the organizational form of the institution. Unlike the nearly uniform partnership model in the U.S., we find a number of active VC investors who are organized as PLCs. 3i Group Plc., the largest investor (163 investments) does not have any board membership in the sample period. This raises a question, does the organization form determine whether the investor partake in costly monitoring and advice role? Moreover, this phenomenon is quite perplexing as implies that such institutions essentially free ride on their syndicate partners. We find that the institutions with branches are less likely to undertake board responsibility. We conjecture that the branches serve as an alternative monitoring and advice mechanism. In further work, we intend to refine the branches measure to capture the distance in miles between the nearest branch of the investor and the location of the invested firm.

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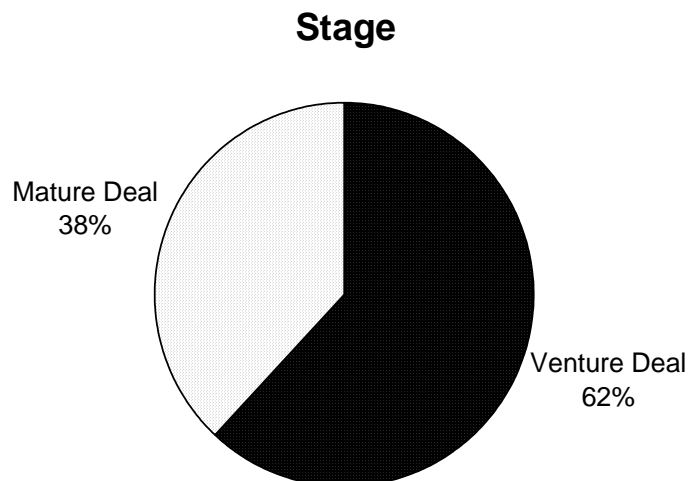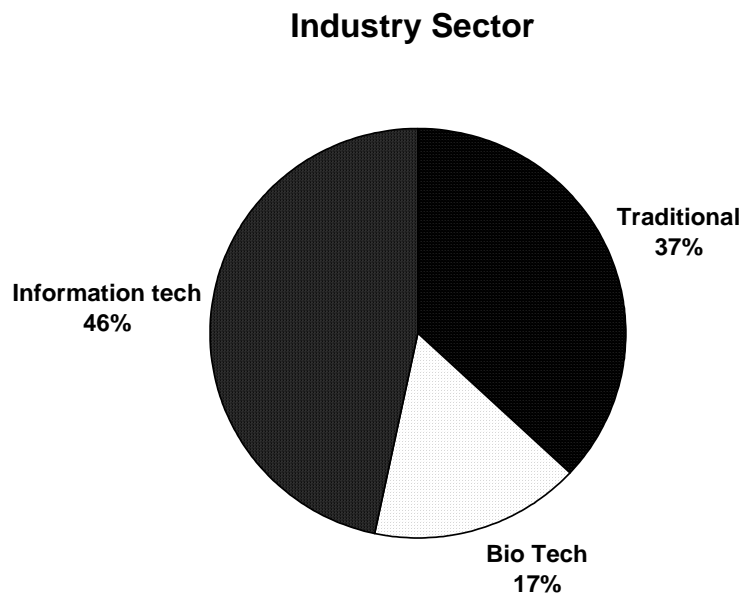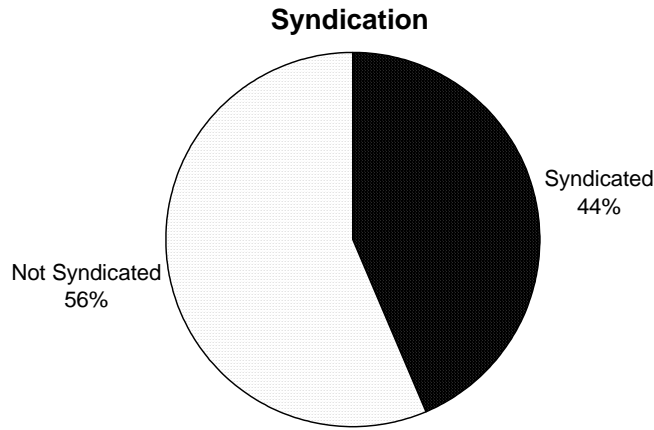
Figure I: Board Membership
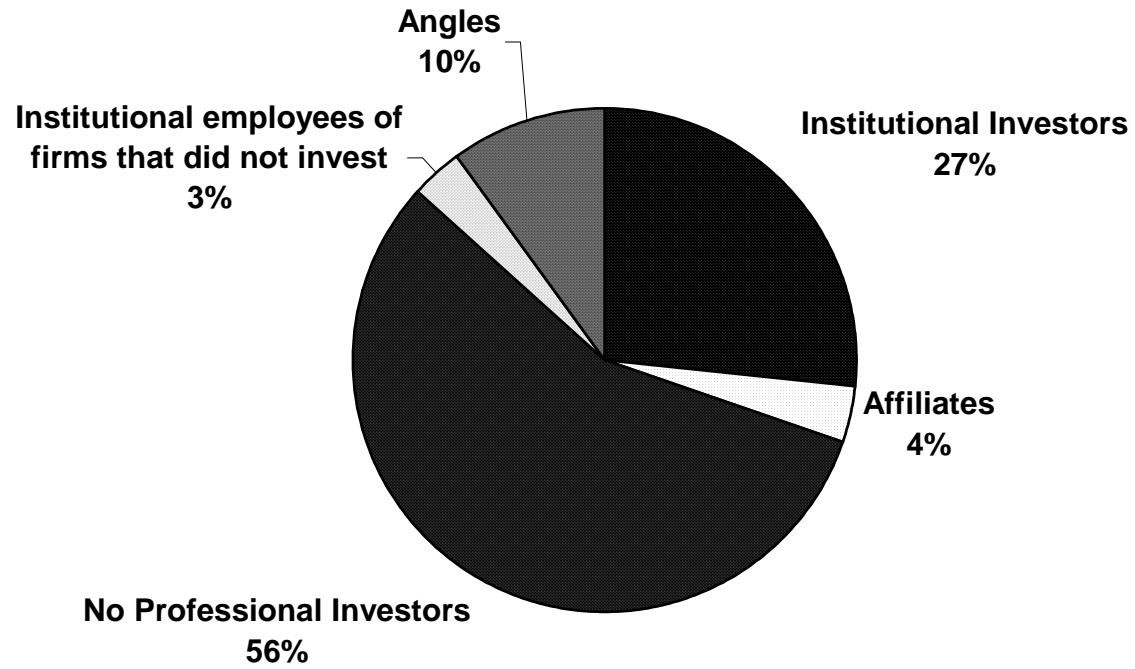
3i Group Plc is the largest single investor in our study it accounts for 163 investments. 3i was founded in 1945 as a quasi government agency to alleviate the equity gap for medium and small firms. It has 9 branches in U.K. and 33 branches in total worldwide. Below are the pie charts of the 163 investments by syndication, industry sector, and stage of the invested firm.

Syndication

Syndicated
44%

Not Syndicated
56%

Industry Sector

Traditional
37%

Information tech
46%

Bio Tech
17%

Stage

Mature Deal
38%

Venture Deal
62%

Table 1
Composition of the board of directors

Summary statistics of the board structure for 998 UK firms that received institutional funding between 1999-2002. Directors are classified into 3 primary categories ***Insider, Quasi Insiders*** and ***Outsiders***. Board structure is classified as pre, additions, subtractions, and post round based. *Panel A* is the count of directors by association; subdivided into A1 and A2 which are traditional venture capital investments and buyout investment, respectively. *Panel B* is the count of directors divided by the number of traditional venture capital investments and buyout investment, respectively; to arrive at the mean number of board members.

	Panel A1				*Panel A2*			
Panel A: Count of Board Members	Venture Deal (617 invested firms)				Buyout Deals (381 invested firms)			
Association	**Pre**	**Addition**	**Subtractions**	**Post**	**Pre**	**Addition**	**Subtractions**	**Post**
Insiders	1826	811	186	2451	1010	844	329	1525
Quasi Insiders	403	224	84	543	219	113	133	199
Outsider: Institutional Investors (invests)	113	143	7	249	13	73	1	85
Outsider: Institutional Investors (no investment)	25	19	3	41	4	9	2	11
Outsider: Angles	85	101	12	174	25	38	14	49
Outsider: Other	133	50	12	171	24	23	11	36
Outsider: Affiliated	22	18	1	39	9	8	5	12
Total	**2607**	**1366**	**305**	**3668**	**1304**	**1108**	**495**	**1917**

	Panel B1				*Panel B2*			
Panel B: Average Board Composition	Venture Deal (617 invested firms)				Buyout Deals (381 invested firms)			
Association	**Pre**	**Addition**	**Subtractions**	**Post**	**Pre**	**Addition**	**Subtractions**	**Post**
Insiders	2.96	1.31	0.30	3.97	2.65	2.22	0.86	4.00
Quasi Insiders	0.65	0.36	0.14	0.88	0.57	0.30	0.35	0.52
Outsider: Institutional Investors (invests)	0.18	0.23	0.01	0.40	0.03	0.19	0.00	0.22
Outsider: Institutional Investors (no investment)	0.04	0.03	0.00	0.07	0.01	0.02	0.01	0.03
Outsider: Angles	0.14	0.16	0.02	0.28	0.07	0.10	0.04	0.13
Outsider: Other	0.22	0.08	0.02	0.28	0.06	0.06	0.03	0.09
Outsider: Affiliated	0.04	0.03	0.00	0.06	0.02	0.02	0.01	0.03
Average board size	**4.23**	**2.21**	**0.49**	**5.94**	**3.42**	**2.91**	**1.30**	**5.03**

Table 2

Descriptive statistics of investment round and investor profile

Summary statistics of the investments rounds and investor profile for 1,220 cases of investment by institutional investors in 998 U.K. private companies between 1999-2002. *RdNum* is the number of times an invested firm received financing from institutional investors, including the current round. *Rd Synd* is a dummy variable taking the value of 1 if there are more than one investor(s) in the round. *RD INVS* is the number of investors in the round. *Rd Amt ($000)* is the total round amount. *Experience* is the number of prior investments made by the investor. *Specific Experience* is the proportion of prior investments by the investor in the industry of the invested firm. *Industry Distance* is the 1 minus the proportion of prior investments in the invested firm industry. *PLC* is an indicator variable that takes a value of 1 if the institutional investor in the transaction is a U.K. public limited corporation. *Branches* are the number of U.K. branches the institution has outside its main office.

Variable Name	Number of Observations	Mean	Standard Deviation	Median	Min.	Max.
RdNum	1220	1.16	0.53	1	1	7
RD Synd	1220	0.50	0.50	1	0	1
RD INVS	1220	2.14	1.68	2	1	12
Rd Amt ($mil)	963	20	109	5	0	2205
Experience	1220	60.66	104.79	17	1	428
Specific Experience	1220	26.69	43.37	9	1	200
Industry Distance	1220	0.38	0.29	0.38	0.00	0.99
PLC	1220	0.22	0.41	0	0	1
Branches	1220	2.41	3.38	1	0	9

Table 3
Regressions of Board Size

OLS and Poisson Regressions to explain the number of directors on the board (*Board Size*) for a sample of 998 UK firms that received institutional funding between 1999-2002. The independent variables are *Venture Deal* which is an indicator variable for traditional VC investment. *RdNum* is the number of times an invested firm received financing from institutional investors, including the current round. *Rd Synd* is a dummy variable taking the value of 1 if there are more than one investor(s) in the round. *RD INVS* is the number of investors in the round. *Industry* of the invested firm is classified as a 3-category indicator variable (biotechnology, information technology and traditional industry). The comparison group is the traditional industry. *Round Amount* is 3-category indicator variable of round amount averaged per participant. The two dependent variables are: Above the Median value, and where No Information on round amount is available. The comparison group is the category of investments with round amount below the median value. Panel A is OLS regression and Panel B is a Poisson regression both with robust corrected standard errors. Indicator variables for the year are used but not reported for brevity.

Panel A: OLS Regression; Dependent Variable: *Board Size*

Independent Variables	Coefficients	T-ratio
Venture Deal	0.825***	4.7
RdNum$^{\square}$	1.252***	4.7
RD INVS$^{\square}$	0.169	0.6
RD Synd	0.677**	2.2
Biotechnology	0.858***	3.63
Information technology	0.402**	2.33
RD AMT Above Median	0.570***	3.35
RD AMT No Info	0.312*	1.88
Constant	3.691***	19.72
Number of observations=1220	Adj. R-sqr = 17.6	F-stat = 23.66

Panel B: Poisson Regression; Dependent Variable: Board Size

Independent Variables	Coefficients	T-ratio
Venture Deal	0.149***	4.71
RdNum$^{\square}$	0.182***	4.89
RD INVS$^{\square}$	0.020	0.46
RD Synd	0.128**	2.62
Biotechnology	0.142***	3.71
Information technology	0.071**	2.3
RD AMT Above Median	0.098***	3.32
RD AMT No Info	0.057*	2.02
Constant	1.367***	37.69
Number of observations=1220	Pseudo R-sqr = 4.0	Wald Chi-square = 282.48

*, **, *** indicates significance at 0.10, 0.05, and 0.001 level respectively
$^{\square}$a natural log transformation of the variable

Table 4
Proportions of insider and institutional investor directors post financing round.

The dependent variables are the proportion of insiders and the proportion of institutional investors of 998 U.K. private companies that received institutional funding between 1999-2002. The independent variables are *Venture Deal* which is an indicator variable for traditional VC investment. *RdNum* is the number of times an invested firm received financing from institutional investors, including the current round. *Rd Synd* is a dummy variable taking the value of 1 if there are more than one investor(s) in the round. *RD INVS* is the number of investors in the round. *Industry* of the invested firm is classified as a 3-category indicator variable (biotechnology, information technology and traditional industry). The comparison group is the traditional industry. *Round Amount* is 3-category indicator variable of round amount averaged per participant. The two dependent variables are: Above the Median value, and where No Information on round amount is available. The comparison group is the category of investments with round amount below the median value. Indicator variables for the year are used but not reported for brevity.

Panel A: OLS Regression; Dependent Variable: Proportion of Insiders

Independent Variables	Coefficients	T-ratio
<u>Venture Deal</u>	-0.116***	-6.6
RdNum$^{\square}$	-0.029	-1.35
RD INVS$^{\square}$	-0.051**	-2.02
RD Synd	0.023	0.78
Biotechnology	-0.062**	-2.7
Information technology	-0.021	-1.24
RD AMT Above Median	-0.002	-0.12
RD AMT No Info	-0.008	-0.48
Constant	0.876***	43.14
Number of observations = 1220	Adj. R-sqr = 12.1	F-stat = 16.72

Panel B: OLS Regression; Dependent Variable: Proportion of Institutional Investors

Independent Variables	Coefficients	T-ratio
Venture Deal	0.044***	4.21
RdNum$^{\square}$	0.041**	2.57
RD INVS$^{\square}$	0.057***	3.66
RD Synd	-0.029	-1.63
Biotechnology	0.048**	3.19
Information technology	0.013	1.26
RD AMT Above Median	0.000	0.01
RD AMT No Info	0.016	1.57
Constant	0.056***	4.41
Number of observations = 1220	Adj. R-sqr = 9.5	F-stat = 10.50

*, **, *** indicates significance at 0.10, 0.05, and 0.001 level respectively

$^{\square}$a natural log transformation of the variable

Table 5
Choice model of venture capitalist decision to serve on board of invested firm

This table is a Heckman corrected Probit choice model for the decision of institutional investor to serve on board of an invested firm. The estimation analyzes the choice between by investors to monitor in 1,121 cases[20] that received institutional funding between 1999-2002. The dependent variable for the model is the presence of the particular institutional investor *on board* of the invested firm post the investment round. The dependent variable is a dummy taking the value of 1 if the investor has representative on board post the financing round. *Early Stage*, which is a dummy variable that takes the value of 1 for a round classified as "early stage" or "startup/seed". *RdNum* is the number of times an invested firm received financing from institutional investors, including the current round. *Rd Synd* is a dummy variable taking the value of 1 if there are more than one investor(s) in the round. *RD INVS* is the number of investors in the round. *Experience* is the number of prior investments made by the investor. *Specific Experience* is the proportion of prior investments by the investor in the industry of the invested firm. *Round Amount* is 3 category indicator variable where the comparison group is the category of investments where the round amount is below the median value. *Industry distance* is the variable that captures the fit between the investor and the industry of the invested firm. *PLC* is an indicator variable that takes a value of 1 if the institutional investor is a public limited corporation. Branches are the number of U.K. branches an investor has. *PLC*Branches* is the interaction between Branches and PLC where the variable takes a value of 1 or more when an investor is both a PLC and has Branches.

Panel A: Probit Regression[21]; Dependent Variable: *On Board*[22]

Independent Variables	Marginal Increase In Probability	Coefficients	Z-ratio
Early Stage Deal	0.095***	0.481***	0.000
RdNum[☐]	-0.035	-0.202	0.413
RD INVS[☐]	-0.013	-0.073	0.644
RD_Synd	0.003	0.016	0.934
Experience[☐]	0.082**	0.474**	0.031
Specific Experience[☐]	-0.065**	-0.377**	0.045
RD AMT Above Median	0.067***	0.433***	0.001
RD AMT No Info	-0.024	-0.140	0.245
Industry Distance	-0.166**	-0.964**	0.032
PLC	-0.050	-0.328	0.102
Branches	-0.015**	-0.086**	0.043
PLC*Branches	-0.038**	-0.218**	0.003
Constant		-0.563	0.088
Observations =1121	Pseudo R2= 0.1131		

*, **, *** indicates significance at 0.10, 0.05, and 0.001 level respectively

[☐] *a natural log transformation* of the variable

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[20] Which does not include 99 cases where the institutional investor has an employee on board prior to the financing round

[21] The figures in the parenthesis are the model t-statistics. The standard errors for the model are corrected for heteroscedasticity using White's robust correction in Stata 8.0. The non-independence of the institutional investor is corrected by cluster the standard errors of an investor using the cluster option in Stat 8.0. The model p-value reports the joint significance of the co-efficients of the independent variable. The Pseudo-R2 =1-Log L/log Lo is the maximized value of the log-likelihood function; where the log Lo is the log likelihood computed only with a constant term. N is the number of observation, which is 1121.

[22] The Hazard variable, which is the two-stage correction for sample selection, is included but not reported. The variable is not significant.