

Venture Capitalists, Syndication and Governance in Initial Public Offerings

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ABSTRACT. This paper examines the development of effective boards in venture capital (VC)-backed initial public offerings. It argues that VC-backed IPOs suffer from two sets of agency costs which are related to principal-agent and principal-principal relationships between the founders and members of the VC syndicate. Using a unique sample of 293 entrepreneurial IPOs in the UK it shows that VC syndicates invest in relatively more risky firms. VC-backed IPOs have more independent boards than IPOs with no VC involvement, with board independence being higher in syndicated VC-backed firms. These results are consistent with assumption that these governance factors are used to mitigate agency costs associated with VC involvement in IPO firms. We also find that in syndicated IPOs there is a higher equity presence of passive private equity firms investing alongside VC firms.

1. Introduction

Increasing attention has been devoted to the going public decision. Much of this research focuses on the extent of under-pricing (Brav and Gompers, 1997; Gompers and Lerner, 1999;

Meggison and Weiss, 1991). The role of venture capital firms (VCs) in IPOs has been examined with respect to signaling and certification of the quality of a private company (Gompers and Lerner, 1999), yet VCs may have an important governance role in IPOs. Governance issues in relation to IPOs have mainly been addressed in terms of changes in the distribution of ownership rights. In contrast, there is little research on more specific governance characteristics, although Certo (2003) provides a theoretical analysis of the role of boards of directors in IPOs. There is also growing recognition that a significant proportion of VC investments involve syndicates of VC firms. While this literature has tended so far to focus on the motives for syndication (Brander et al., 2002; Kanninen and Keuschnigg, 2000; Lockett and Wright, 2001; Sorenson and Stuart, 2002) and the impact VC involvement may have on IPO short- and long-term performance (e.g., Barry et al., 1990; Gompers, 1995; Lerner, 1994, 1995; Megginson and Weiss, 1991), a neglected issue concerns the implications of syndication for the governance of VC-backed firms during and after the IPO process.

This paper provides a novel extension to previous work in three ways. First, we build upon the agency literature that recognizes the existence of agency problems in different contexts (Jensen and Meckling, 1976). Specifically, we argue that VC-backed IPOs suffer from two sets of agency costs which are related to moral hazard problems in principal-agent and principal-principal relationships. The former arises between the VC firm and the investee in risky investments with asymmetric information (Reid, 1998). The latter arises between the members of the VC syndicate. Second, we provide empirical evidence on corporate governance characteristics of VC involvement in

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IPOs, notably in terms of board structures and share ownership, both between VC-backed and non-VC backed IPOs and between those IPOs with only one VC investor and cases where there is a syndicate of VC and other investors. Third, we examine the extent of syndication outside the VC industry by both single VCs and syndicates of VCs, notably with respect to industrial partners and later stage private equity firms. This extension of syndication outside the VC sector may make important contributions to accessing and assessing information for the monitoring of VC investments. Fourth, to verify our conceptual framework, we use a unique dataset of 293 entrepreneurial IPOs in the UK during the period of 1999–2002. We define entrepreneurial IPOs as those stock market flotations in which the original founders retain equity stakes and board positions.

This paper is structured as follows. Section 2 outlines the conceptual framework adopted. This is followed by a description of the data sources, variable definitions and research methodology. Section 3 presents the results. Conclusions are drawn in a final section.

2. Conceptual framework

We base our arguments on the corporate finance and agency literatures that address the governance problems of IPOs and suggest that VC involvement in entrepreneurial IPOs is more likely when a fast-growing firm represents a risky investment, and traditional sources of finance are not available. The relationship between the VC and the entrepreneur can be seen as a principal–agent one (Reid, 1998). In such relationships, moral hazard problems may arise that involve shirking by the entrepreneur, attempts to shift risk to the venture capitalist or in some cases problems and delays in the disclosure of information by the entrepreneur to the VC (Fiet, 1995; Reid, 1998). To safeguard their investment from moral hazard problems, venture capitalists typically introduce contracts with the entrepreneur that specify rights to the allocation of ownership and control as well as to cash flows and other control rights (Chan et al., 1990; Kaplan and Strömberg, 2000; Reid, 1998; Sahlman, 1990). Ownership and control allocations and board

rights stress the relational nature of VC governance (Bergemann and Hege, 1998). Problems in designing complete contracts in highly uncertain and dynamic markets suggests an important role for corporate governance mechanisms in the monitoring of investees. Contractual board rights provide for the presence of VC non-executive director representatives on boards to facilitate access to information and to intervene in the strategic direction of the investee. This process is likely to give rise to boards that are more independent of the entrepreneur than might be expected in IPOs without VC backing.

Another way of dealing with the uncertainties associated with risky IPOs is to syndicate the investment. Syndication is a means by which VCs can share risk through portfolio diversification since for a given fund size it enables the spreading of capital across a greater number of investments (Cumming, 2003; Wilson, 1968). However, syndication itself may create a second agency problem relating to the behavior of the syndicate members. Again, we suggest that corporate governance factors may be used to mitigate possible moral hazard problems. The following sections develop these arguments further and generate a number of testable hypotheses.

2.1. *Venture capital backed IPOs*

The development from a private company to a public company involves the professionalization of management and corporate governance. The establishment of an efficient board may be especially important in both offsetting the lack of experience of entrepreneurs and providing independent judgment to mitigate entrenchment behavior by incumbent management (Filatotchev and Bishop, 2002). These arguments suggest that internal organizational capacity, such as accumulated knowledge, decision-making ability, resources, etc. no longer meets the demands associated with emergent prospects for growth, and some external support is urgently needed by the fast-growing firm.

In the UK, VC firms may invest in both high risk early stage ventures as well as management buy-outs. As far as entrepreneurial IPOs are concerned, we expect that VCs would be involved in firms with a higher degree of uncertainty. In a

world of asymmetric information, specialist VCs are a particular type of financial intermediary (Amit et al., 1990; Chan, 1983; Reid, 1999) with the expertise to reduce idiosyncratic information-based market failures in risky sectors (Amit et al., 1998). VCs, as opposed to private equity firms investing in later stage transactions, are likely to possess skills to add value to riskier ventures with growth opportunities (Lockett et al., 2002). Entrepreneurs in lower risk ventures and/or those with highly capable entrepreneurs are likely to find less need for venture capital involvement. Hence:

Hypothesis 1a: VC firms' involvement is more likely in higher risk IPOs.

In a syndication, two or more venture capital firms come together to take an equity stake in an investment. The percentage of investments syndicated in the UK venture capital market rose in 1999 to 27% after having fallen for several years. This was followed by a sharp fall in 2000 and 2001 to about half this level as venture capital firms moved away from the high tech sector following the collapse of the dot.com boom. By 2002, the more uncertain investment environment appears to have been associated with a further sharp increase with 26.5% of investments being syndicated (EVCA, 2003). Venture capital firms typically undertake repeat syndication over time with a network of partners (Bygrave, 1987, 1988; Chiplin, et al., 1997).

Each syndicate usually contains lead and non-lead firms, with an individual venture capital firm playing both roles over time depending on the particular deal. Each syndicate is temporary in nature with the financing structure constructed specifically for that transaction. This limited longevity of the syndicated investments may create moral hazard problems associated with the "principal-principal" relationship between syndicate members (Young et al., 2002).

Syndicated investments may be riskier than stand alone ventures (Brander et al., 2002). A fully diversified portfolio is more difficult for VC firms than for institutional investors who invest in listed stock because of the presence of large ex-ante asymmetric information in VC investment decisions (Lockett and Wright, 2001;

Reid, 1998; Sahlman, 1990). Syndication thus may be undertaken as a means of risk sharing through portfolio diversification as it permits VCs to invest in more portfolio companies than would otherwise be possible (Cumming, 2003; Zacharakis, 2002). Hence:

H1b: IPOs backed by syndicates of VCs are more likely to be riskier than IPOs backed by single VCs.

2.2. Corporate governance in IPO firms: From principal-agent to principal-principal perspectives.

IPO studies have increasingly recognized that large-block investors such as venture capitalists may have a strong impact on corporate governance development because they have specialist monitoring skills and gain detailed knowledge and substantial decision-making rights in the IPO firms that they finance (Gorman and Sahlman, 1989; Gompers and Lerner, 1999; Lerner, 1995). VC firms' special contractual rights end at the time of an IPO, yet because of lock-in/lock-up arrangement they retain significant proportions of their holdings after the firm comes to market (Brav and Gompers, 1997; Megginson and Weiss, 1991). VC firms may thus have a strong incentive to develop an efficient, independent board during and after the IPO to compensate for their relative loss of control (Black and Gilson, 1998). VC firms' continued board membership (Brav and Gompers, 1997) may provide an effective counter-balance to insiders' power while board independence may be used to perform their monitoring and strategic functions. The effectiveness of these monitoring and control functions is usually related to structural factors such as the proportion of outsiders on the board, CEO/Chairman roles held jointly or separately, etc. (Shivdasani, 1993; Zahra and Pearce, 1989).

Institutional and resource dependency theories suggest that the creation of an independent board of directors is also important in co-opting important external constituencies and gaining access to valuable skills and scarce information to enhance the survival of the firm in the changing institutional environment surrounding the IPO (Oswald and Jahera, 1991; Pfeffer, 1972). Previous studies

have also suggested that rapidly growing new firms may quickly outgrow the founder's managerial capacity (Mello and Parsons, 1998; Willard et al., 1992). As environmental and organizational complexities grow, different knowledge and skills are needed and the founder's accumulated knowledge may create a cognitive barrier to effective strategic responses to changing circumstances (Daily and Dalton, 1992; Jayaraman et al., 2000). In the context of IPOs, a reduction in founders' share ownership subsequent to flotation may reduce their incentives to learn and apply their knowledge to the benefit of the newly-created public firm and its external shareholders (Filatotchev and Lam, 2002; Jain, 2001; Sapienza and Gupta, 1994; Schulze et al., 2003).

These arguments suggest that corporate governance development in the IPO firm may be used strategically to supplement the original entrepreneurs (Geletkanycz and Hambrick, 1997). VC firms may be particularly adept at assisting management-thin entrepreneurial firms in recruiting high caliber independent directors (Barry et al., 1990; Gorman and Sahlman, 1989; Lerner, 1995; Schefczyk and Gerpott, 2001). Large shareholders such as VCs may also encourage board diversity as a channel to access required resources (Filatotchev and Toms, 2003).

Thus the governance characteristics of the IPO firm may be an effective counterbalance to potential agency conflicts associated with founders' cognitive limits and misalignment of their financial incentives as a result of the IPO. Independent board members, separation between the roles of CEO and Chairman, increase in institutional shareholding, etc., can be effective tools used by VC firms to circumvent moral hazard problems. This discussion suggests the following hypothesis:

H2a: IPOs backed by a VC investor are more likely to be associated with the development of an independent board than are IPOs not backed by a VC investor.

A second influence on the development of independent boards concerns syndication by pre-IPO investors. Venture capital syndicates involve the sharing of decision making among the syndicate members. The lower the level of co-operation among syndicate members, the greater the levels

of relational risk and hence the associated agency costs. The origins of the agency costs in the syndicate may arise from the diverse objectives of members and the time-consuming nature of coordination. In VC deals with multiple rounds of financing, the lead investor may also have an informational advantage vis-à-vis other syndicate members where they enter in later rounds (Admati and Pfleiderer, 1994).

This complex relationship between multiple principals is defined as a principal-principal agency problem (Young et al., 2002) as opposed to the principal-agent problem between investor and investee. These agency problems can in principle be addressed in a number of ways. Shared equity ownership in VC syndicates may bring benefits of higher levels of trust and knowledge acquisition (Beamish and Banks, 1987), as well as mutual forbearance and stability (Mjoen and Tallman, 1997; Yan and Gray, 2001) that provides an effective remedy to situations where the lead syndicate member has access to more information about the investee than the non-lead members (Das and Teng, 1998).

However, lead venture capital firms may seek a larger equity stake in return for their greater effort in monitoring the investee and coordinating the syndicate (Wright and Lockett, 2003). The investment agreement between the syndicate members may be important in specifying rights of access to information, board membership rights, etc., for non-lead syndicate members but may be limited by the problems associated with the complexity of contracting.

It is in the interests of the lead venture capital firm not to mislead syndicate partners in sharing information because of the potentially damaging impact on reputation and lack of willingness to reciprocate future deals (Norton and Tenenbaum, 1993; Wright and Lockett, 2003). Repeated interaction can lead to high levels of trust as syndicate members come to know how partners will behave (Lockett and Wright, 1999). As venture capital industries are typically small close knit communities, this scope for building trust and reputations is enhanced (Black and Gilson, 1998).

Another possibility to reduce these principal-principal moral hazard problems is to use the IPO firm's governance system as a mechanism for arbitrage between the potentially diverse

objectives of syndicate partners (Filatotchev and Bishop, 2002; Gompers, 1995). Where skilled lead venture capital firms are less reliant on other syndicate members for specialist information (Admati and Pfleiderer, 1994) and are more likely than non-leads to exert hands-on influence over investees (Wright and Lockett, 2003), the development of an independent board may be important in ensuring that the syndicate functions effectively. Non-lead syndicate members may seek the appointment of an independent non-executive Chairman to perform the functions of an “arbiter”. Non-executive board membership may be increased through the presence of non-lead syndicate members to enhance transparency in decision-making and thus co-operation (Wright and Lockett, 2003). Hence:

H2b: IPOs backed by syndicates of VCs are more likely to develop independent boards than are IPOs backed by single VCs.

2.3. Syndication of venture-capital investments and syndicate partners

In addition to the above arguments, a resource-based perspective suggests that syndication can bring specialized resources for the ex-post management of investments (Brander et al., 2002). By syndicating deals, VC firms are able to increase the portfolio they can optimally manage through resource sharing (Jääskeläinen et al., 2002; Kanninen and Keuschnigg, 2000; Seppä and Jääskeläinen, 2002). VC firms can access more information by syndicating with other reputable VC firms. However, in specialist areas, VC firms may seek to syndicate with industrial partners. These industrial partners may have more specialist knowledge than either the VC firm itself or other VCs. This knowledge can be important in evaluating the initial investment, in post-investment management and in providing an eventual exit route. Hence:

H3a: IPOs backed by single VCs are more likely to involve investment with industry partners than are IPOs backed by syndicates of VCs.

As the investee develops, there may be a need to access further significant funds. The initial VC backer may have the specialist market based

skills but need to access further funds to diversify the risk associated with scaling up the operation. As VC funds are typically small (Reid, 1998), they may seek to syndicate deals that are large relative to their fund size, which typically involve later stage private equity funds (Lockett and Wright, 2001). VC syndicates may therefore also syndicate with private equity firms that specialize in later stage ventures. Hence:

H3b: IPOs backed by syndicates of VCs are more likely also to involve investment with private equity firms that specialize in later stage ventures than are IPOs backed by single VCs.

3. Data and methodology

To construct a sample of entrepreneurial IPOs, a multi-stage data collection procedure has been used. First, we compiled a list of all IPOs that have been floated on the London Stock Exchange (LSE) and the Alternative Investment Market (AIM) from 1 January 1999 to 30 September 2002. Our primary list of IPOs was obtained from the *London Stock Exchange New Issues* files. Further information was provided by the *AIM Market Statistics* publications. From the original list of 631 IPOs we excluded re-admissions and transfers from the main market to AIM. We also excluded flotations of unit and investment trusts, since they have very specific governance characteristics. At the second stage, we excluded all IPOs that represented de-mergers, equity carve-outs, reverse take-overs and equity reorganizations. Investment and acquisition vehicles were also excluded since their governance systems are extremely simplified, and their boards resemble investment committees of private equity firms. We included in the final sample spin-offs from existing entrepreneurial firms, but only if the founders of the parent company were also the founders of the IPO firm. Finally, we included flotations of MBO/MBI, but only when the lead managers of a buy-out were also involved with the IPO firm. Wright et al. (2000), for example, suggest that MBO/MBIs represent an entrepreneurial transformation of the whole (or part) of an existing business, which justifies their inclusion in our sample. After these selection steps, the final sample included 293

entrepreneurial IPOs, and for each firm we were able to identify the original founders or leaders of a buy-out team. Our main variables of interest were obtained from information provided in the IPO listing prospectuses, which contain detailed information on the career histories and pre- and post-IPO ownership of managing officers and other board members. The IPO prospectuses were obtained from the *Thompson One Banker Analytics* database which provides comprehensive coverage of companies' files for publicly quoted firms in the UK. The missing listing prospectuses were collected directly from the firms and/or their advisors by sending written requests. The IPO-related stock market data were obtained from the *London Stock Exchange Share Monitoring Service* and *Datastream*.

Board interests were measured in terms of the percentage of the total number of ordinary shares retained by founders, executive and non-executive board members after the IPO as reported in the listing prospectus. We also obtained information on share ownership of founders who were not board members. In addition to the share ownership stakes mentioned in the "Directors' interests" section of the prospectus, the three ownership variables for each group of board members also included shareholdings whose voting rights have been effectively controlled by the directors through various trusts, as well as stakes owned by outside firms that were controlled by the directors. The latter allowed us to account for an ownership pyramid effect that may increase directors' voting power beyond the limits of their immediate retained share ownership.

To verify the extent of VC involvement in the IPO firms we analyzed the "Other substantial interests" sections of listing prospectuses. We identified the percentage of the total number of ordinary shares owned by venture capitalists before and after the IPO. Venture capital firms were identified from the *British Venture Capital Association 2000/2001 Directory*, *2000 Pratt's Guide to Venture Capital Sources*, and *2000/2001 Venture Capital Report Guide to Venture Capital in the UK* (see Lerner, 1994, for a discussion of these sources of information). We also considered share ownership of Venture Capital Trusts (VCTs) that are managed by established VC firms. VCTs are smaller, specialist funds that are nor-

mally set up for tax purposes by the larger players in the UK venture industry. This share ownership data allows us to identify both the presence and total number of VC firms in the IPO. In terms of a sub-sample of VC-backed IPOs, 45 IPOs were backed by a single VC, and 27 IPOs were syndicated. Finally, the "Other substantial interests" section also provided us with information on pre-IPO and retained shareholdings of industry partners and other non-VC investors.

4. Empirical results

To verify our research hypotheses, we used a combination of multivariate and univariate analyses. First, we used binary logistic models to examine the relationship between risk variables and the likelihood of VC involvement. The dependent variable is an index of VC backing of the IPO, equal to unity if the firm has VC investors, and zero otherwise. Estimation is by maximum likelihood and was performed using Limdep software.

To prevent the occurrence of spurious correlation in the logit analysis, several controls were used. Previous research acknowledges the importance of firm size and age in terms of their effects on organizational outcomes (Amit et al., 1990; Mikkelsen et al., 1997). The IPO's size was measured in terms of the logarithm of the firm's capitalization at the offer price, and age was measured by the number of years between the firm's founding date and its IPO date.

Although firm-specific factors are traditionally considered as the major drivers of strategic change according to the resource-based view (Barney, 2001), a growing body of research suggests that organizational outcomes may also be influenced by external, industry-level factors (see Mauri and Michaels, 1998, for discussion). To control for possible industry effects, four sector dummies were used for non-cyclical consumer products (SIC code 40), cyclical services (SIC code 50), financial sector (SIC code 80), and information technology (SIC code 80) firms, with remaining firms being used as a control. A separate dummy was introduced for the Internet firms. To account for the presence of "hot" market conditions, we introduced three time dummies for 1999–2001, with 2002 being used as control.

We used pre-tax profit with a one-year lag as a measurement of the “riskness” of the IPO. In addition, we introduced two other proxies for “riskiness” of the IPO: Scaled Risk = number of years of performance history before flotation; High risk dummy = 1 if there is only one year of performance history before flotation.

Table I reports estimated coefficients, asymptotic t-ratios and weighted elasticities, the later providing the measure of responsiveness of the probability of VC backing to variations in exogenous variables (see Reid, 1997, for a detailed discussion of this methodology). All the models were well-specified. The initial model (Model 1) shows that VC-backed IPOs were significantly more likely to be older and larger and to be in cyclical services and computers and software sectors, although the elasticity coefficient for cyclical services is just above 0.1. VC-backed IPOs were significantly less likely to have taken place in 2000, the year just after the burst of the “technology bubble”. Model 2 introduces pre-tax profits in the year prior to the IPO but this variable was not significant. In Model 3, two further risk measures are introduced. Both scaled risk as measured by the number of years of pre-IPO performance disclosed in the prospectus and high risk as measures by the availability of only one year’s data are positive and significant at the 5% level, and they have relatively high elasticity coefficients. These findings provide partial support for hypothesis H1a that VC firms are more likely to be involved in high risk IPOs.

At the next stage, t-tests were used for a sub-sample of VC-backed IPOs as the size of this sub-sample restricted our ability to use multivariate analysis. Table II examines sample differences between syndicated and single VC-backed IPOs. Using univariate statistical tests, we were unable to detect any statistically significant differences between those firms where there was a syndicate of VCs and those firms with only one VC in age of the firm and assets. Syndicated VC-backed IPOs were also not significantly larger than those IPOs with a single VC in terms of market capitalization (Table II). However, there were significant differences in terms of average sales and pre-tax profits over three years before the flotation between these two groups of firms where we were able to obtain three years of pre-IPO data.

These findings are consistent with our arguments suggesting that the VC syndication is associated with an increase in firm-level risk, as suggested by hypothesis H1b.

There were some notable significant differences between VC-backed IPOs and the non-VC-backed IPOs in the sample in terms of governance characteristics (Table IIIA). Board size was significantly larger in VC-backed IPOs and these firms also had a significantly larger percentage of non-executive directors on the board. In contrast, non-VC backed IPOs were significantly more likely to have greater shares of founders’ and executives retained ownership following IPO. There were no significant differences between the two groups of firms in terms of the percentage of cases where there was a non-executive chairman, and the percentage of cases where the CEO and chairman were separate. These findings provide mixed support for hypothesis H2a.

As Table IIIB clearly indicates, venture capital syndication is associated with further increase of board independence. Syndicated VC-backed IPOs had a significantly larger percentage of non-executive directors on the board compared to single VC IPOs. A significantly larger percentage of these firms had a non-executive chairman and separate CEO and chairman. In contrast, single VC-backed IPOs were significantly more likely to have greater shares of founders’ and executives’ retained ownership following IPO. There were no significant differences between the two groups of firms in terms of the board size. These findings provide support for hypothesis 2b that syndicated VC investments are more likely to develop independent boards.

There were no significant differences between the two samples in respect of the value and size of the lead VC’s portfolio of investments. The mean value of the lead VC’s portfolio in syndicated deals was £1.43 billion (standard deviation £1.44 billion) while in single VC-backed firms it was 1.06 billion (standard deviation £1.33 billion). The mean size of the lead VC’s portfolio in syndicated deals was £3.79 billion (standard deviation £3.49 billion) while in single VC-backed firms it was £3.16 billion (standard deviation £3.96 billion).

However, significant differences between syndicated VC-backed IPOs and single VC-backed

TABLE I
Maximum likelihood Logistic analysis of VC involvement in the IPO

	Model 1	t-ratio	Weighted elasticity	Model 2	t-ratio	Weighted elasticity	Model 3	t-ratio	Weighted elasticity
Age	0.035*	1.95	0.18	0.039*	2.13	0.21	0.032 [†]	1.70	0.18
Log (capitalisation)	1.12***	4.26	1.25	1.14***	4.27	1.27	1.15***	4.07	1.29
1999	-0.33	-1.19	-0.19	-0.36	-1.18	-0.19	-0.41	-1.31	-0.22
2000	-0.87*	-0.43	-0.04	-0.89*	-0.49	-0.04	-1.01*	-0.65	-0.06
2001	-0.55	0.53	0.04	-0.61	0.56	0.04	-0.74	0.62	0.05
Cyclical services	1.10*	1.72	0.11	1.11*	1.74	0.11	1.21*	1.87	0.12
Non-cyclical services	0.56	1.15	0.19	0.55	1.13	0.18	0.64	1.29	0.21
Financial services	-0.28	-0.43	-0.02	-0.24	-0.37	-0.02	-0.22	-0.34	-0.02
Computers and software	1.07*	1.83	0.19	1.12*	1.91	0.19	1.21*	2.04	0.22
Internet	-0.44	-1.23	-0.13	-0.44	-1.22	-0.13	-0.43	-1.16	-0.12
Pre-tax profits, year-1				0.00	-1.29	0.00	0.00	-1.37	0.00
Scaled risk							1.02*	2.01	0.92
High risk dummy							1.94*	1.73	0.46
Nagelkerke R ²	0.20			0.20			0.22		
Percent of correct Predictions	76.76			78.14			79.21		
Likelihood ratio test	$\chi^2 = 39.60 > \chi^2_{0.01}(10) = 23.21$			$\chi^2 = 39.95 > \chi^2_{0.01}(11) = 24.73$			$\chi^2 = 44.44 > \chi^2_{0.01}(13) = 27.69$		

[†] $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$; Scaled Risk: number of years of performance; High risk dummy: 1 if only one year of performance.

TABLE II
VC Syndication: company characteristics and performance

	VC syndicated IPOs $n = 27$	Single VC IPOs $n = 45$
Log (capitalization)	1.73 (0.62)	1.69 (0.69)
Age	7.88 (8.20)	9.35 (8.49)
Net assets, £ millions	4.19 (8.21)	4.26 (5.11)
Fixed assets, £ millions	8.24 (16.58)	13.04 (41.24)
Sales, £ millions (average for last three years) ^a	6.08 (12.32)	42.01** (134.78)
Pre-tax profits, £ millions (average for last three years) ^a	-0.91 (2.06)	1.30* (5.52)

^a sub-samples of 20 VC-syndicated and 30 single VC-backed IPOs who had three years of performance data. Standard deviations in parentheses. Second column reports results of t-test of mean differences, * $p \leq 0.05$; ** $p \leq 0.01$

TABLE IIIA
Governance characteristics: VC-backed and non-VC-backed IPOs

	VC-backed IPOs $n = 72$	Non-VC backed IPOs $n = 222$
Board size, sample average	6.40 (1.51)	5.72** (1.58)
Non-executive chairman, % of sub-sample	0.66 (0.47)	0.61 (0.48)
% of non-executives on board, sample average	0.46 (0.15)	0.31* (0.13)
Chairman and CEO separate, % of sub-sample	0.82 (0.38)	0.84 (0.36)
Founders' retained share ownership, % of total	24.93 (18.13)	34.27*** (21.80)
Executives' retained share ownership, % of total	22.60 (19.23)	36.12*** (22.40)

Standard deviations in parentheses. Second column reports results of t-test of mean differences, * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

IPOs were identified in terms of a number of ownership characteristics. Share ownership by VCs before the IPO in syndicated deals was weakly significantly higher than that for single VC-backed deals (Table IV). There was a strongly significant difference between the two groups of firm in mean share ownership by VCs after the IPO. It appears that mean retained ownership after IPO changes little in syndicated deals but falls sharply in single VC-backed deals. The mean number of VCs in the syndicate before and after the IPO was 3.14 and 2.58, respectively, which indicates that only a minority of VC firms used IPO as an exit route.

Although the number of industry partners and the share these parties held before IPO was greater for IPOs with single VCs than those funded by syndicates of VCs, the differences were not statistically significant. Hence, hypothesis H3a is not supported. These findings may suggest that there is less need for the specialist skills of industrial partners in syndicated VC investments because there is a greater need for risk spreading in these cases. Where there is a need for specialist industry skills the difference between IPOs funded by single and syndicated VCs is less clear cut.

However, our results clearly show that syndicated VC-backed deals had a significantly higher number of other private equity investors as well

TABLE IIIB
Governance characteristics: VC-syndicated and single VC-backed IPOs

	VC Syndicated IPOs <i>n</i> = 27	Single VC IPOs <i>n</i> = 45
Board size, sample average	6.70 (1.53)	6.22 (1.49)
Non-executive chairman, % of sub-sample	0.81 (0.39)	0.57* (0.49)
% of non-executives on board, sample average	0.51 (0.15)	0.42* (0.14)
Chairman and CEO separate, % of sub-sample	0.96 (0.19)	0.73* (0.44)
Founders' retained share ownership, % of total	16.25 (12.22)	30.14*** (19.19)
Executives' retained share ownership, % of total	13.95 (12.94)	27.78** (20.60)

Standard deviations in parentheses. Second column reports results of t-test of mean differences.

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

as significantly higher share ownership by these investors, both before and after the IPO, than is the case in single VC-backed firms (Table IV). These findings provide support for hypothesis H3b.

5. Discussion and conclusions

Using a unique sample of 293 entrepreneurial IPOs in the UK, this paper has examined the development of effective boards in VC-backed initial public offerings. Our analysis has made a novel contribution to the understanding of corporate governance in IPO firms and to the nature and operation of syndicated VC investments.

We have argued that VC-backed IPOs experience two sets of agency costs which are related to principal-agent and principal-principal relationships between the founders and members of the VC syndicate. The probability of VC backing is positively associated with risk proxies and contextual factors (high-tech industry, age, and size etc.) (Hypothesis H1a). A moral hazard problem, relating to information asymmetries in high-risk ventures between the founders and external investors, may be mitigated by syndication. Our evidence shows that VC syndicates invest in relatively more risky firms (Hypothesis H1b). From a governance perspective, VC involvement is associated with more independent boards. VC-backed IPOs have more independent boards than IPOs with no VC involvement (Hypothesis H2a).

A second agency problem arises between the lead and non-lead members of a VC syndicate. The resolution of this moral hazard problem is associated with even higher board independence (Hypothesis H2b). At the same time, founders' retained share ownership is at its lowest in VC-syndicated IPOs. These results are consistent with the assumption that these governance factors are used to mitigate agency costs associated with VC involvement in IPO firms.

Our analysis also identified that the syndication of investments may extend beyond the sharing of investments among a group of VC firms. Although we find that single VCs are more active in teaming up with industry partners, this relationship was mainly insignificant (Hypothesis H3a). In contrast, we also find that in syndicated IPOs there is a significantly higher equity presence of passive private equity firms investing alongside VC firms (Hypothesis H3b). As these passive private equity firms are less likely to have specialist industry and monitoring skills, this aspect may be associated more with the portfolio diversification and risk-sharing hypothesis for syndication.

This study is associated with a number of potential limitations. First, our analysis is focused on IPOs in the period 1999–2002. Although we have included a number of “hot” IPOs in our sample, the vast majority of firms have been floated during the period of increasing investors' conservatism, and this may have had a

TABLE IV
Syndication and ownership

	VC syndicated IPOs $n = 27$	Single VC IPOs $n = 45$
VCs:		
Number of VC firms before IPO	3.14 (1.65)	1.0 ***
Share ownership of VC before IPO	27.53 (22.82)	17.86 [†] (16.99)
Retained share ownership of VC after IPO	27.76 (13.91)	11.95*** (9.35)
Number of VC firms after IPO	2.57 (1.98)	0.84*** (0.36)
Private equity firms:		
Number of other private equity firms before IPO	1.63 (1.46)	0.62** (0.87)
Share ownership of other private equity firms before IPO	11.91 (9.88)	4.75** (7.91)
Number of other private equity firms after IPO	1.92 (1.77)	1.02* (1.45)
Retained share ownership of other private equity firms after IPO	12.61 (12.95)	7.42 [†] (11.66)
Industry partners:		
Number of industry partners before IPO	0.42 (0.60)	0.53 (0.80)
Share ownership of industry partners before IPO	2.38 (3.44)	6.41 (13.81)
Number of industry partners after IPO	0.44 (0.64)	0.42 (0.72)
Retained share ownership of industry partners after IPO	4.05 (10.02)	3.77 (8.74)

Sub-sample averages. Standard deviations in parentheses. Second column reports results of t-test of mean differences,[†] $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

systematic impact on IPO governance characteristics. An extension of our sample by including earlier IPOs may help to verify the generalizability of our results. Second, our main variables of interests were collected from listing prospectuses and subsequent annual reports, and very little is known about pre-IPO governance effects of VC firms. Third, the design of our sample included firms that have been successfully floated, which introduces a certain selection bias toward more successful firms. Although this sample selection is in line with previous studies, some authors strongly point out that findings might be biased in studying only firms which went public, instead of all firms which could have conceivably gone public during the sample time period. Therefore, there is a need to take into account a potential “survivor bias” (e.g., Higgins and Gulati, 1999; Stuart et al., 1999).

The findings of the study suggest a number of areas for further research. First, our analysis has focused on governance in VC-backed IPOs in the UK. There is growing recognition that governance and the operation of VC firms may depend on the institutional environment (Black and Gilson, 1998; Jeng and Wells, 2000). Further research might usefully extend our analysis of the role of syndicates to other institutional contexts, such as countries associated with network-based corporate governance systems (La Porta et al., 1997). Second, we did not explore specifically how the VC teams and boards changed from founding until going public. There are commonly several rounds of financing between a firm’s founding and IPO, with each new financing round resulting in some changes to the team and board. An obvious extension to this current research would be to explore how the extent of

board independence and ownership structure change over time; how different team/board characteristics attract external backers at each round; and vice-versa.

Finally, an IPO is not the final stage in the corporate governance life-cycle. In a dynamic perspective, corporate governance factors may be affected by strategic choices and outcomes, and the choice of the various governance options could be associated with changes in organizational strategy and firm performance (Dalton et al., 1999). For example, board diversity may be driven by the organization's growing needs for managing the important external elements of the environment that are related to changes in the organization's size and diversity (Pfeffer, 1972; Provan, 1980). Therefore, the post-IPO evolution of the firm's governance system is a key research issue.

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