Journal of Business Finance & Accounting, 25(5) & (6), June/July 1998, 0306-686X

VENTURE CAPITAL AND PRIVATE EQUITY: A REVIEW AND SYNTHESIS

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> The 1980s control activities, . . ., have demonstrated that the M&M [Modigliani and Miller] theorems (while logically sound) are empirically incorrect. The evidence from LBOs, leveraged restructurings, takeovers and venture capital firms has demonstrated that leverage, payout policy and ownership structure (that is, who owns the firm's securities) do in fact affect organizational efficiency, cash flow and, therefore, value. (Jensen, 1993, p.868)

INTRODUCTION

In the last fifteen years, venture capital has emerged as an important area of finance for academic researchers. This interest lags well behind the development of the venture capital industry both in the US and elsewhere. Venture capital is typically defined as the investment by professional investors of long-term, unquoted, risk equity finance in new firms where the primary reward is an eventual capital gain, supplemented by dividend yield. Earlier reviews of the literature have covered the period up to 1981 (Tyebjee and Bruno, 1981), from 1981 to 1988 (Fried and Hisrich, 1988) and more recent research, although less exhaustively, by Barry (1994). The emphasis in these earlier reviews has been on US studies which focus primarily on formal venture capital as early stage finance, frequently with a high technology aspect.

The purpose of this paper is to review and synthesise a wide body of research relating to venture capital and thence to identify possible directions for future research. In undertaking such a task it is important at the outset to identify what is distinctive about venture capital and which justifies its separate

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analysis within the field of corporate finance. These broad motivations can be summarised as follows.

First, there are marked differences between venture capital and mainstream corporate finance. Venture capital involves the financing of new or radically changing firms which contrast in many important informational ways to established companies quoted on a stock market, notably the problem of asymmetric information. Venture capitalists are attracted to this kind of investment because of the specific skills they perceive themselves to possess.

Second, venture capital has until recently been a relatively neglected area in corporate finance. Even now, research is patchy and has not addressed the full scope of possibilities offered by a broad interpretation of the term venture capital. Although literature reviews are emerging which deal with a subset of the new forms of organisations identified by Jensen in his presidential address to the American Finance Association, and summarised in the quote at the start of this paper (Jensen, 1993; Palepu, 1990; and Thompson and Wright, 1995), these have tended to focus on buy-outs and recapitalisations not venture capital.

Third, and leading on from the second, venture capital as noted already has tended to be viewed narrowly as referring to new firms. However, venture can be and is in practice increasingly used in firms undergoing radical restructuring. Early stage and start-up funds account for only about six per cent of the annual value of European venture capital investments (EVCA, 1995), with management buy-outs and buy-ins accounting for 46 per cent of funds invested. Hence, the potential contribution of venture capital and venture capitalists goes far beyond this limited perspective with the term 'private equity' increasingly being used. This opens up scope for the development of both theory and empirical studies which provide comparative analyses of the differing types of venture capital investment.

Fourth, there is an absence in the previous literature of a full examination of the operation of the venture capital market as a whole. Fried and Hisrich (1988) identify a model which focuses on the processes undertaken by venture capital firms and the relationships between venture capital firms and their funds' providers, however their review of the literature focuses on six topics — portfolio of venture capital firms, investment decisions, operations, strategy, impact on the entrepreneur and public policy — which are not linked to their model. The review by Barry (1994) identifies on an *ad hoc* basis a number of important issues relating to venture capital, that is, discussion of what venture capitalists do, evidence on the success of venture capital, venture capital and the going-public process, contracting technology between venture capitalists and entrepreneurs and between venture capitalists and their investors, and evidence on the positive role of venture capital.

In neither of these reviews is consideration given to the interplay of competitive forces in the venture capital market and their implications for venture capital firms. Where market imperfections remain problematical and increasing competition reduces returns from super-normal towards normal levels, firms are forced to seek new investment opportunities in less problematical areas and/or to develop enhanced distinctive competencies at identifying and monitoring investments. As will be seen in more detail below, this helps to explain the frequently observed extension of maturing venture capital markets into a wider range of investment activities which include development capital, management buy-outs and buy-ins as well as early stage investments.

On this basis, this paper for the first time analyses the issues involved in venture capital at two interrelated levels, that is from the industry/market level and the venture capital firm level (Figure 1). As will be seen, there is little work on the demand side of the market, that is relating to the decision-making process by which firms seek venture capital. Hence the principal focus of this review concerns the operation of the supply side of the market, that is the behaviour of venture capital firms.

Bruno (1986) shows that Porter's (1980) competitive forces model provides a framework for reviewing industry level issues as it directly analyses the ability of an industry to sustain long-term profitability by reference to the degree of inter-firm rivalry, the power and roles of customers and suppliers, new entrants and providers of substitute products and services. However, within this framework, the degree to which individual firms contribute to inter-firm rivalry will be influenced by the incentives and governance mechanisms in place and its degree of success in undertaking the process of investment in venture capital. Models of the venture capital investment process (e.g. Fried and Hisrich, 1994) provide a means of structuring a review of issues at the firm level which range from the initial generation of transactions through to post-realisation.

Accordingly, the paper is structured as follows. The next section summarises the links and distinctions between traditional mainstream corporate finance theory and venture capital. The third section reviews the literature at the industry and market level. This involves issues concerning the structure and interaction of venture capital competitors, the power of suppliers of funds to the industry, the power of customers in demanding and searching for venture capital, the importance of substitute products (especially informal venture capital, LBO Associations and banks), and the role of new entrants. The fourth section reviews existing literature at the firm level. This section focuses on the governance of venture capital firms by their funds' providers and the process of venture capital investment in investee companies. The latter raises issues concerning deal generation, initial and second screening (pre-contracting problems), deal valuation and due diligence, deal approval and structuring, post-contractual (general and restructuring and failure), investment realization and entrepreneur's exit and assessment by venture capitalists and post-exit monitoring and recontracting. In the light of the industry/market level and firm level analyses, the fifth section examines the evidence concerning the performance of the venture capital industry. The final section presents conclusions and suggestions for further research. As already indicated, this review encompasses the range of investment stage activities undertaken by venture capitalists, which includes development and replacement capital, management buy-outs and management buy-ins as well as early stage investments. Because of space limitations the principal scope is restricted to the formal venture capital industry,[1] though reference is made to informal venture capital and other competing sources of funds as appropriate.

VENTURE CAPITAL AND CORPORATE FINANCE

Mainstream corporate finance theory can be divided into two main categories: the financing of investments and the undertaking of investments (e.g. Brealey and Myers, 1996). The financing of investments primarily involves analysis of the contracts whereby investors provide funds to the firm in return for claims on the future values it produces. The undertaking of investments concerns the use to which funds are put and in particular the issues involved in making decisions about the investment of funds in capital equipment, other companies, etc.

The existence of conflicts of interest, and associated informational asymmetries, between shareholders and managers introduces an agency cost problem which may affect a corporation's investment and financing decisions. The optimal capital structure which deals with these issues involves both considerations of the division of ownership between managers and outsiders as well as the relative positions of debt and equity-holders (Jensen and Meckling, 1976). The structuring of such arrangements has important implications for the nature of corporate governance. In respect of the second category, a major aspect of making investment decisions has been the elaboration of a consistent and rational approach to the valuation of assets, within which concepts such as the time value of money and risk return relationships are fundamental. While these two dimensions of mainstream corporate finance theory also relate to venture capital, the latter is distinct from other forms of corporate finance in several ways as summarised in Table 1 and elaborated as follows.

Perhaps the key distinction between venture capital and mainstream corporate finance relates to the problem of asymmetric information. Venture capital investments are made in companies not quoted on stock markets, where the investor trades-off the short term illiquidity in the shares held for the prospects of a greater future return. As Fama (1991) has shown, the available evidence suggests that private information in quoted companies is rare; hence the development of passive investment strategies by investment managers. In contrast, new and radically changing firms are characterised

Table 1

Principal Comparisons of Venture Capital and Traditional Corporate Finance Theory

Attribute	*Traditional Corporate Finance Theory*	*Venture Capital*
1. Tradeability of shares	Liquid	Illiquid
2. Monitoring of management by shareholders	Passive/indirect	Active/direct
3. Role of market for corporate control	High	Low
4. Access to capital	Competitive 'anonymous' capital market	1. Early stage: access limited to set of financiers with highly specialised skills 2. Later stage/buy-outs: closer to competitive market but active monitoring skills required
5. Asset specificity	Generally relatively low	Firms with non-redeployable/highly specialised assets
6. Project valuation	Application of a wide range of techniques	Restricted range of techniques (e.g. where early stage investments do not pay dividends) and/or need for greater range of sensitivity analysis because of greater uncertainty of cash flows
7. Investment decisions	Single stage	Multi-stage
8. Information availability	Private information is rare; provision of public information is mandatory	Private information widespread and difficult to reveal, hence requirement for close monitoring of managers

by the problems of informational asymmetry between insiders and outsiders, where there is both a need for relatively close monitoring and where specialists in such monitoring may be able to achieve super-normal returns.[2]

Venture capitalists typically take a more active and interventionist role in firm decision-making. In mainstream corporate finance theory, a number of corporate governance mechanisms are directed at dealing with the agency problem, notably shareholder voting rights to elect the board of directors, directors' fiduciary duties, mechanisms for setting executive remuneration, independent (non-executive) directors, and the market for corporate control. In venture capital investments, block ownership of equity can be considered as an alternative governance mechanism to takeovers as a means of disciplining managers. Venture capitalists are typically more actively involved than non-management shareholders in quoted corporations, including institutional shareholders. Venture capitalists' portfolios are likely to be relatively undiversified compared to those of institutional investors, while executives are more likely to have remuneration contracts more closely aligned to the performance of their portfolio. The illiquidity of venture capitalists' equity holdings also means that governance via exit in the short term is problematical. The position of venture capitalists on the board should enable more timely identification of when management should be changed than would be possible by an outsider searching for a takeover target (Romano, 1996).

Venture capitalists can essentially be viewed as seeking a return on their specific and distinctive skills in identifying, investing in and monitoring new and/or radically changing firms (such as management buy-outs and buy-ins undergoing restructuring). The need for the specific skills of venture capitalists arises because of the problems of access to information in such firms noted already and their capabilities in assessing risk and the type of financial structure which can accommodate it. As such, access to capital differs from the notion of an 'anonymous' competitive capital market. Rather, the problem for entrepreneurs is to identify those venture capitalists with the specific skills to invest in their projects. The role of the specific skills of the venture capitalist can be seen as taking an enterprise to a stage where other forms of financial intermediation and corporate ownership and control are appropriate. It is from this stage onwards that traditional corporate finance theory is focused. Venture capitalists at this stage are likely to exit either immediately or over a period of time and apply their skills in other ventures.

Venture capital is particularly appropriate in a specific subset of firms which have non-redeployable or highly specialised assets. This together with the greater uncertainty of cash flows in early stage new technology businesses in particular suggests that equity finance as provided by a venture capitalist is preferable to debt. Moreover, the concentrated ownership and direct board position provided by venture capital is preferable to the diffuse ownership of mainstream corporate finance theory because of the need for more timely access to information and intervention to control management (Romano, 1996).

While in principle many of the valuation techniques developed in mainstream corporate finance theory are applicable to venture capital investments, and some such as real options approaches to valuation may be particularly important as will be seen below, access to information may pose particular problems. Early stage investments require valuation approaches which can handle uncertain and/or rapidly growing future cash flows in markets which may scarcely be established. Methods relying on constant dividend payments, or even the payment of dividends at all, as well as those which rely on historic information, are particularly problematical.

Venture capital typically involves for early stage projects the provision of several rounds of finance rather than a one-off injection of funds. This brings complications to the investment decision but may allow the investor to exercise more control over management through the structuring of multi-stage contracts. Although, as we have noted already, there are important differences between venture capital investments and projects in mainstream corporate finance theory with regard to access to information, a further difficulty for venture capitalists is that even closeness to the entrepreneur may not lead to the revelation of full information. This raises major issues about the nature of the monitoring relationship which we consider in detail below.

The distinctiveness of venture capitalists from other sources of finance can be identified in respect of the types of situations where each may, in general, be appropriate. Banks can be typified as seeking to obtain a return from their skills in screening and investing in well-established, relatively stable activities which are not expected to undergo radical restructuring and which require a relatively modest degree of monitoring. For these enterprises, information availability is expected to be relatively reliable and robust, with the bank able to identify with a high degree of certainty the existence of sufficient value in the enterprise's assets to provide security for the debt finance which is to be provided, thus behaving in a generally risk averse way. Also in contrast to venture capitalists, strategic alliances between a relatively new enterprise and an existing corporation enable the former to gain access to finance and may in general be appropriate where the skills involved in the technology are such that firms already in the industry are more knowledgable and skilled in their development than would be possible for the venture capitalist to obtain. This brief outline suggests that there is a distinct class of activities where venture capital and venture capitalist involvement may be particularly appropriate.[3]

In the sections which follow, especially that relating to the operation of the venture capital process, notions of addressing the problems of asymmetric information are extensively examined.

INDUSTRY AND MARKET LEVEL

From major initial developments in the US, there has been a diffusion of venture capital market growth first to the UK and then throughout Europe and beyond.[4] Tyebjee and Vickery (1988) note the variation in maturity of different venture capital markets in Europe, while Roure et al. (1990), Ooghe, et al. (1991) and Murray (1995) argue that market development is likely to be associated with greater competition, reduced rates of return and a shift to later stage investments. The following sub-sections review industry level issues using Porter's competitive forces framework outlined in the Introduction.

Rivalry Between Firms

In analysing competition between formal venture capitalists it is important to consider the investment stages they target since this provides an important segmentation of the industry. In terms of investment stages, it has been suggested that late-stage investors, especially investing in smaller buy-outs, should not be considered venture capitalists (e.g. Bygrave and Timmons, 1992), though given that many such venture backed transactions can involve considerable product and organisational innovation this argument seems debatable (Wright, Robbie and Ennew, 1995). There is growing recognition of the need to consider the portfolio mix of investment stages adopted by venture capitalists (see e.g. Elango et al., 1995), a point to which we return below. Moreover, industry statistics encompass in the term venture capital all stages of investment. While some venture capitalists do invest across the range of investment stages, others only invest in late stage projects. In 1995 later stage financings represented 96% of the total value of investments and 84% of the total number of financings made in that year by members of the British Venture Capital Association (BVCA, 1996a).[5] As much of the activity of venture capitalists is focused on later stage investments, the term private equity capitalists may increasingly be a more appropriate descriptor.

Power of Suppliers

Sourcing of funds used by venture capitalists can be divided into two principal areas. 'Captive' venture capitalists, which are part of banks or insurance companies, do not have to raise capital from third parties (Abbott and Hay, 1995). In the UK they are often viewed as investing primarily in later stage projects such as development capital and management buy-outs and buy-ins. 'Independent' firms tend to be seen as the more traditional type of venture capitalist though in the UK at least many of these may only engage in later stage transactions. They are typically funded through limited-life closed-end funds, with funding coming from pension funds, foreign investors, etc., and are more committed than captives to generating a return for investors through realising a capital gain within a more clearly specified period of time; the latter are more likely to place a higher emphasis on the income stream from their investments. In 1995 independent venture capitalists accounted for 47 per cent of new funds invested (BVCA, 1996). Murray (1995) notes the increasing power of funds providers in a maturing market as evidence becomes available on the nature of the performance of venture capitalists in investing previous funds (we return to the evidence on performance below). Recent funding developments, however, have meant that traditional captive institutions have become more hybrid (or semi-captive) as they source funds from outside to add to those provided by their parent bank or insurance company.

McNally (1994) provides an analysis of the role of corporations both as direct (i.e. through corporate venturing) and indirect (i.e. through funds) investors in venture capital and suggests that problems relating to mismatches in expectations between corporations and other parties in relation to investment time scale and control mechanisms in particular have resulted in major difficulties in the development of this source of finance.

Power of Customers

There has been relatively little attention to demand side issues although Bruno and Tyebjee (1985) refer to the cost to the entrepreneur of the equity relinquished, the effects of the long time that may be taken to raise venture capital finance and the chances of raising venture capital from another supplier when rejected by an initial venture capital firm. An important area is the potential role of intermediaries. Hustedde and Pulver (1992) examined the role of different types of intermediaries in securing venture funds for their entrepreneurial clients. Their results showed that entrepreneurs who failed to seek advice were more likely to be less successful in acquiring equity finance, but that those using bankers or public agencies were likely to increase their chances of failure. While providing interesting insights, the study focused primarily on entrepreneurs seeking finance for early stage projects.

Evidence from Murray, et al. (1995), relating to management buy-outs shows that management generally take the dominant role in the venture capital identification process and, particularly, the final choice decision. Given the considerable uncertainty of the process and the acknowledged inexperience of most managers in respect of obtaining venture finance, it is surprising that most managers in smaller deals (but not in larger ones) only involve their key advisers late in the process, if at all.

These findings provide interesting insights into the relative power of customers and have clear implications for both industry and, as will be seen below, firm levels since they suggest an asymmetry in bargaining to the advantage of the venture capitalist in respect of smaller transactions.[6] There has, however, been little attempt to address systematically the relative power of entrepreneurial customers where their contribution to the venture is very specific and difficult to replace. A further issue is raised in the particular context of venture capital backed management buy-outs of divisions of larger firms where the divestor is seeking to obtain the maximum price for the disposal through an auction process.[7] In such circumstances, incumbent managers may or may not be able to exercise power over the venture capitalist, depending on their specific contribution to the firm and the skills the venture capitalist possesses in being able to replace them if necessary.

These issues link to the firm level problems concerning deal generation and screening to be considered below.

Threat of New Entrants

Manigart (1994) finds support for a population ecology approach to the entry of firms into venture capital markets, with the major influences on the overall founding rate being the density of the industry. Interestingly, institutional changes were not found to be influential. Wright (et al., 1992) in examining the management buy-out sector of the overall venture capital market suggest that institutional changes are important at least in the initial stages of market development, but that subsequently new entrants are encouraged by evidence that attractive returns are being earned. Roure et al. (1990) also show that greater market maturity is associated with entry by a greater variety of funds' providers, especially by pension funds and insurance companies. Ooghe et al. (1991) support this view and in addition find that public sector funds' providers are more likely to exit. Relatively little attention has been directly addressed to the influences on new entrants to markets from other countries. However, Wright et al. (1992) and Murray (1995) find evidence from UK venture capitalists that they are attracted to enter new markets in other countries because of declining opportunities in their original market, their accumulated expertise and perceived comparative advantage over domestic competitors in new markets in seeking out and taking advantage of emerging opportunities. These authors also consider the appropriateness of differing entry strategies and suggest that a major problem is insufficient attention to developing an understanding of the workings of new markets with in particular little regard to the need to recruit local executives with the necessary market expertise. There is, however, little systematic evidence as yet as to whether entrants' behaviour is dynamic in the sense that they adapt their entry strategies according to previous experience and differing market conditions.

Threat of Substitutes

In addition to the comparisons between mutual funds and venture capitalists seen in the previous section, three other competing funders are of particular interest, informal venture capitalists (or business angels), LBO Associations, and banks.

Informal Venture Capitalists

Informal venture capitalists, or 'business angels' are individuals who seek to invest a part of their personal wealth in, typically, a minority equity stake in an entrepreneurial venture.[8] Evidence by Landstrom (1993) shows that there are marked international differences between the involvement of informal investors in their investee companies. In terms of transaction screening, investors in the UK devote little attention whereas in the US it is moderately high and in Sweden high. Post-transaction in the UK, such investors are generally passive, in Sweden they are generally active, whilst in the US they are active and highly involved in day-to-day activities. US informal investors take the highest risk in their portfolio of investments. Contrary to views that informal investors are less constrained by the need to earn returns in a specified period, Landstrom finds their exit horizons were usually less than five years. There is also some evidence that informal venture capital markets are inefficient in terms of the communications channels between investors and entrepreneurs (Mason and Harrison, 1992; and Freear and Wetzel, 1990).[9]

An important issue concerns the extent to which agency theory applies as well to informal as it does to formal venture capitalists. Landstrom (1992), finds little evidence that the involvement of business angels in monitoring their investments will vary according to the level of agency risk and suggests that the agency framework is inappropriate. He argues that the assumptions applicable in agency theory which concern rational economic maximising behaviour, asymmetric information and conflicting objectives are not valid in the case of informal investors since they are more motivated by non-economic factors, have a desire to make a value-added contribution and are able to mitigate asymmetric information problems through prior relationships and close involvement in the business.

However, it is necessary to understand the differing approaches of the two types of venture capitalists towards two types of risk. Fiet (1995b) finds that formal venture capitalists attach more importance to market risk than agency risk and vice versa and argues that formal venture capitalists are less concerned about agency risk because they protect themselves from it through stringent contracting which enables them to replace underperforming entrepreneurs. Informal venture capitalists who screen very few deals per year have access to comparatively limited information and place more emphasis on agency risk, that is finding the 'right' entrepreneur who will be able to address market risk. Fiet (1995a) also shows that formal venture capitalists make greater use of formal informant networks and that they prefer their own due diligence to reliance on informal networks.[10]

There is also evidence (Ehrlich et al., 1994) of significant differences between formal and informal venture capitalists in respect of investee monitoring, with the former providing more difficult targets, and greater feedback and involvement in monitoring especially when the firm is experiencing problems. These differences may arise because private investors neither have the time, expertise nor flexibility to engage in close monitoring, so that formal venture capitalists may be more appropriate for entrepreneurs with high technical but low managerial skills and vice versa for private investors. These arguments suggest that agency theory is also of importance for informal investors, but that greater emphasis is placed on ex ante rather than ex post issues. To trust an investee entrepreneur to manage market risk, the informal investor will have had to develop skills for dealing with adverse selection problems. In the absence of these skills business angels may react by not investing ('virgin angels') despite screening large numbers of potential investments.

LBO Associations

There is some considerable degree of overlap between specialist providers of funds to buy-outs (LBO Associations, Jensen, 1989) and venture capitalists (Sahlman, 1990). Both invest funds on behalf of other institutions and although there is a degree of heterogeneity in the forms they take, both are often, especially in the US, organized as limited partnerships. Both cases involve relationship investment with management, managerial compensation is oriented towards equity and there are likely to be severe penalties for underperformance. The principal differences concern the nature of the relationship between investor and investee and that in investments by LBO Associations most of the funding required to finance an acquisition is through debt. Sahlman (1990) in comparing LBO Associations with venture capitalists notes that executives in the former may typically assume control of the board of directors but are generally less likely than venture capitalists to assume operational control. Investments by venture capitalists, which may also involve buy-outs as well as start-ups and development capital, make greater use of equity and quasi-equity.[11] These differing relationships and financing instruments may be used to perform similar functions in different types of enterprise, so widening the applicability of the active investor concept within the Anglo-American system of corporate governance (Wright et al., 1994).

Banks

While the overall need of small and growing firms to have bank finance has been widely researched, Chan et al. (1990) raise the issue of the need to explore the conditions which lead to the simultaneous existence of banks and venture capitalists.[12] They suggest that venture capitalists may have advantages over banks in providing finance in settings where entrepreneurial skills are highly uncertain at the outset and the role of close monitoring is potentially significant. As banks begin to develop close long term relationships involving detailed information flows with their corporate customers (Binks and Ennew, 1995; and Holland, 1994), there would appear to be increasing convergence with the approach adopted by venture capitalists. Moreover, the problems faced by venture capitalists in respect of adverse selection and their response in terms of increased price versus refusal to fund is analogous to issues concerning the so-called finance gap (De Meza and Webb, 1987). There is also evidence relating to the role and operation of debt covenants in management buy-out investments, that in the UK at least these are operated in a more flexible manner than might have been supposed (Citron, Robbie and Wright, 1997). These developments suggest a need to compare the investment selection and monitoring behaviour of banks and venture capitalists as the overlap in their activities increases.

FIRM LEVEL

In examining firm level issues it is useful to view venture capitalists as facing a two-level principal-agent relationship between themselves and their providers of capital and between themselves and the managers of the companies in which they invest (Sahlman, 1990). Firstly, in respect of the relations between venture capital firms and their funds' providers, the previous section has shown that venture capital firms obtain their funding from a range of sources each with their own objectives. However, the availability of alternative outlets for funds and evidence from performance with previous tranches of funds provides a measure of power in the dynamic context where venture capital firms need to raise second and subsequent rounds of funds to invest in further projects. Not only does this raise issues as to whether or not funds' providers will extend funds, it also raises issues concerning their governance of venture capital firms in order to help ensure that their objectives are met. Hence as agents, venture capital firms may be faced with the risk that if they do not perform satisfactorily they will fail to attract further funding. Secondly, venture capital firms as principals face problems in screening potential investments due to both uncertainty and adverse selection problem and moral hazard problems in the post-investment monitoring of their investee companies. Reid et al. (1995) show that venture capitalists attempt to manage the risks involved in their activities, firstly through fine filters on proposals, high hurdle rates of return and being strongly resistant to downside risk exposure to address adverse selection and secondly, through tight monitoring and an unwillingness to bear all the risk in order to address moral hazard issues. Each of these two firm level aspects is considered in turn.

Governance of Venture Capital Firms

A pioneering study by Sahlman (1990) examines the nature of the principal-agent relationship between funds providers and venture capitalist and identifies the mechanisms used to help minimise these problems, which include incentives for mutual gain, the specific prohibition of certain acts on the part of the venture capitalist which would cause conflicts of interest, limited life agreements, mechanisms to ensure gains are distributed to investors, expenditure of resources on monitoring the venture capitalist and the regular provision of specific information to the funds providers by the venture capitalist. The terms of the contract both communicate the expectations of funds providers and filter out those venture capitalists who are unable to meet these requirements. Venture capitalists' remuneration is typically based on an annual management fee plus some percentage of the realised profits from the fund. Sahlman points out that good venture capitalists by accepting a finite funding life and performance dependent compensation are signalling their quality in relation to weak ones, but that the funds' provider has to invest in intensive screening in order to guard against false signalling.

A significant agency problem may also arise in the valuation of investments for the purposes of reporting to providers of funds. It is venture capitalists as agents who are responsible for such valuations and on which their performance will be judged (Fried and Hisrich, 1994). However, since it may take many years for a venture capital investment to come to fruition, considerable subjectivity surrounds the valuation of investments in any particular year before the investment is realised. In the absence of clear and 'complete' rules, management may have the scope and incentive to report biased interim investment values. The adoption of different valuation practices also makes it difficult to compare the performance of individual venture capital firms. In the UK, the BVCA in an attempt to produce a more consistent approach to valuation, has introduced guidelines which recommended four appropriate valuation methods for its members (BVCA, 1993). However, venture capitalists have the discretion to decide themselves which one they will adopt.

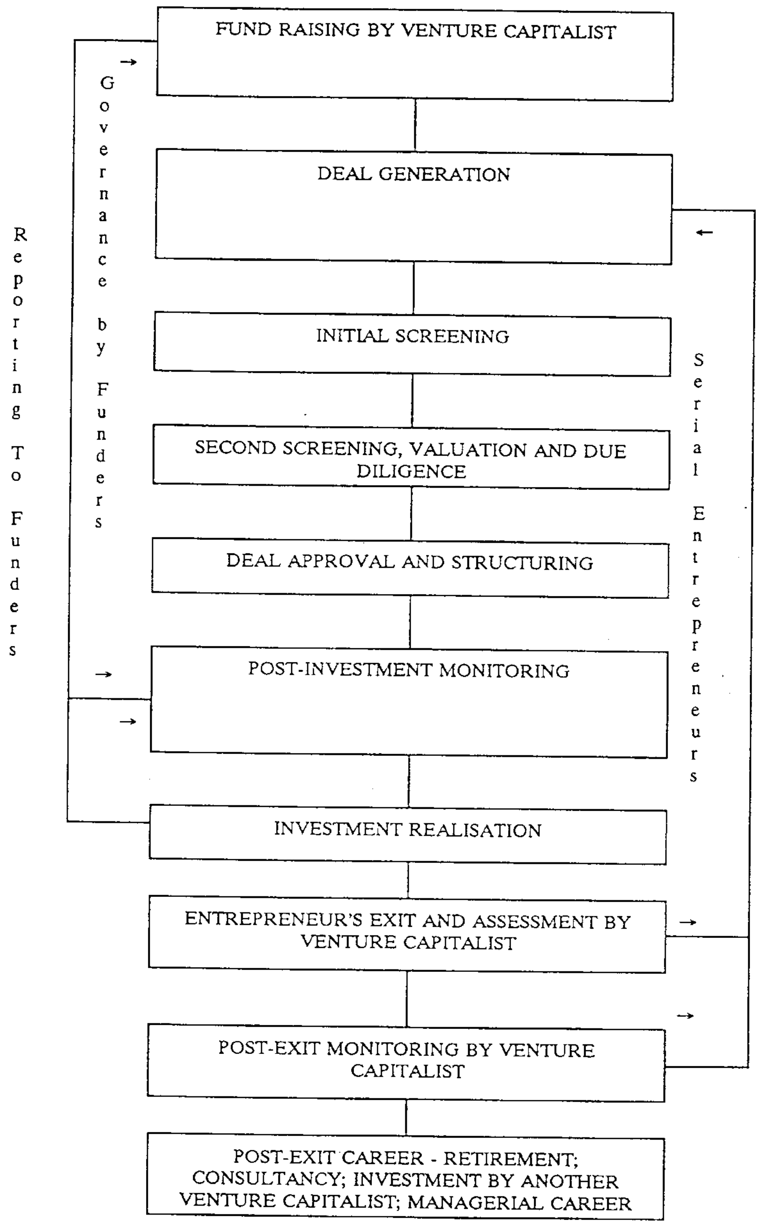
The Venture Capital Process

The stages in the venture capital funding, assessment and monitoring process have been analyzed in a number of studies (e.g. Bygrave and Timmons, 1992; Fried and Hisrich, 1994; MacMillan, et al., 1985; Tyebjee and Bruno, 1994; and Sweeting, 1991b). These stages have been identified from direct analysis of the operation of venture capitalist's operations and have been based on approaches which have sought to develop an understanding of what it is that venture capitalists do (Figure 1). Identification of these stages helps to highlight the inter-linkages between them. As becomes clear in what follows, however, the greater body of research has tended to focus on issues raised by individual stages.

A clear gap in the literature to date has been the failure to recognise the dynamic nature of the process. That is, there is a need to consider the possibility that venture capitalists may seek to reinvest in entrepreneurs who have exited from their existing portfolios. Recognising this dynamic nature of venture capital investment extends previous approaches by explicitly incorporating reinvestment into the model. As will be seen below this dimension may raise new issues for the venture capital investment process. The following sub-sections review evidence relating to the venture capitalist-investee stages in turn.

Figure 1

Venture Capitalist Fund Raising, Deal Appraisal, Monitoring and Serial Entrepreneurs



Deal Generation

At the beginning of the venture capital process it is crucial to obtain access to viable projects which can be funded at entry prices which will generate target rates of return. The difficulties faced by venture capitalists because of entrepreneurs' search and decision processes, and increases in competition between venture capitalists noted earlier, serve to highlight the importance of a deal generation strategy. While there has been attention to these issues by practitioners, there has been relatively little academic research.

Deal generation is closely linked at the strategic level to venture capitalists' preferences with respect to investment stages and deal size, as well as to the availability of information and the recruitment of venture capitalist executives with the specific skills to seek out transactions (Murray, 1995; and Bygrave and Timmons, 1992). There is some evidence from both the US and the UK which draws attention to the implications for deal generation of differences between the regional locations of venture capitalists and those of potential investees (Murray et al., 1995). As seen earlier, problems here link back to an understanding of the dynamics of the power of customers in differing segments of the market. Operationally, issues are raised which concern the comparative net benefits of proactive versus reactive approaches. In an environment of increasing competition for deals there appears to be a move towards more proactive approaches, even though this involves increased costs and may require greater technical as well as financial skills, which may only be possessed by certain segments of the market.

Initial and Second Screening — Pre-contracting Problems

At the time that a venture capital investment is being considered, institutions are faced with a potential adverse selection problem in that they are unable to gauge the manager's performance in the enterprise prior to deal completion (Amit et al., 1990). Adverse selection issues also raise crucial problems in the potential effectiveness of post-transaction monitoring by institutional investors (Stiglitz and Weiss, 1981). To the extent that these problems lead investors to misjudge the situation, a deal and accompanying financial structure may be agreed which is inappropriate and possibly unviable. As a result, the control mechanism introduced by the commitment to meet the cost of servicing external finance may lead to sub-optimal decisions.

Amit et al. (1990) develop a model which examines the nature of the adverse selection problem for venture capitalists. The general assumption is made that the entrepreneur knows his own ability level, whereas the venture capitalist does not. In an initial case it is assumed that the entrepreneur is risk neutral and no new investment is needed. In such conditions, only entrepreneurs with below average ability will choose to involve a venture capitalist who, because of the absence of information, makes a bid to fund a project on the basis of the average ability level. This will result in a negative net present value investment and because of the severity of the adverse selection problem the market breaks down. Relaxing this assumption to allow for risk averse entrepreneurs may still mean that only low-ability entrepreneurs accept the venture capitalists' bid while the high ability ones develop ventures on their own.[13] Venture capitalists may enter a low bid because they fear the consequences of over-bidding for projects which subsequently are revealed as poor performers. In so doing, they may attract less skilful entrepreneurs but they may also attract some higher ability entrepreneurs who are seeking risk-sharing. However, the dynamics of a competitive market may mean that the price of a bid is driven up and higher bids are needed to entice more high-powered entrepreneurs. Hence, the venture capitalist may be forced back to offering premia for the projects of low-ability entrepreneurs.

This model provides interesting and potentially important insights into the operation of a venture capital market and may go some way to explaining the phenomenon that subsequently successful ventures may initially have been refused venture capital finance, together with the relatively low amounts of venture capital funding of early stage investments where information asymmetry problems are most serious. However, the model does not incorporate a number of essential features which may help our theoretical understanding of this stage of the venture capital process. The paper assumes that entrepreneurs can invest in effort to perfectly reveal their skills in order to eliminate information asymmetries. Important extensions would be to consider the case, firstly, of imperfectly revealed information which would reduce but not eliminate information asymmetries. Secondly, the issue could be considered from the perspective of venture capitalists who may not simply accept a state of (near) ignorance about the entrepreneur but may expend effort and costs in seeking to reduce information asymmetries and provide a more efficient means of matching entrepreneurs and venture capitalists. Sweeting (1991b), for example, points out that venture capitalists have been particularly proactive in deal generation in an attempt to reduce adverse selection problems by becoming more involved with entrepreneurs at an earlier stage. Other sections below consider the evidence relating to post-transaction information generation by venture capitalists. Consideration of both the entrepreneur's and the venture capitalist's perspectives suggests scope for the development of a game theoretic approach to information revelation. The authors also assume that once the decision is made to go with a venture capitalist, the author turns over to them the right to determine the sharing agreement. An interesting extension would be to develop a model of bargaining in the negotiation of the venture capital contract in such circumstances.

There may also be scope for theoretical development of the venture capitalist's approach to bidding (pricing), for example to consider the nature of performance contingent contracts rather than one-off agreements. Moreover, the extent to which venture capitalists raise the price of their involvement or simply refuse to invest is debatable. The use of performance contingent contracts is one reflection of how venture capitalists may raise the price but this is typically used where the venture capitalist is satisfied about the quality of management but there is disagreement about the level and timing of meeting forecast performance.

The nature of the adverse selection problem may not be constant with all entrepreneurial ventures, but may vary with the stage and sector of an investment. In a buy-out, investing institutions may be guided by incumbent management's experience in post and their knowledge of the business, though management may have an incentive not to reveal full information in an attempt to obtain the most favourable terms. In a buy-in as the entrepreneur comes from outside there may be problems of asymmetric information, both in relation to their true skills and an inability to observe the manager in post ex ante (Robbie and Wright, 1996). In development capital situations it may be difficult to judge whether the entrepreneur's previous performance will continue in the future where his/her equity stake is diluted by the introduction of venture capital. The informational asymmetry problems may also be more intractable in the case of complex high-tech/bio-tech ventures than for more straightforward ventures using existing technology, which raise issues concerning the specialist skills of both the entrepreneur and the venture capitalist. Further theoretical developments might usefully attempt to model these different situations. Empirical studies may also help to identify the extent and nature of potential adverse selection problems.

Empirical studies examining venture capitalist investment criteria have evolved from descriptive studies of the variables taken into account to those which attempt to identify the relative importance of various criteria using a variety of rating and ranking scales and principally focused on start-ups (e.g. Bruno and Tyebjee, 1985; MacMillan et al., 1985 and 1987; Hall and Hofer, 1993; and Rah et al., 1994). However, whilst these approaches implicitly consider adverse selection issues, there has been a tendency for them to be atheoretical.

MacMillan et al. (1987) show that the most important criteria used by venture capitalists in screening investment proposals were entrepreneurial personality and experience, with lesser dependence being placed on market, product and strategy. In a replication study, Fried et al. (1993), show that six years on, venture capitalists were more concerned with market acceptance and less demanding of high potential rates of return and quick exit, which these authors see as a more realistic view of venture potential. However, while providing useful insights, these studies are open to a number of criticisms: they focus primarily on early stage investments rather than later stage; they primarily use rating scales where individual respondents may attach differing importance to a particular score; they generally use mail questionnaires which may fail to obtain the full essence of the screening process; and they fail to identify the trade-offs venture capitalists need to make between different criteria.

In a critique of the questionnaire-based methodology and early stage focus of many previous studies, Fried and Hisrich (1994) use detailed analysis of the process adopted by venture capitalists in specific cases covering the full range of investment stages. They suggest that venture capitalists use three generic criteria for screening investments — the viability and novelty of the project; the integrity, track record and leadership skills of management; and the possibility for high returns and an exit — before proceeding to detailed evaluation. Muzyka et al. (1995) emphasise that venture capitalists have to make trade-offs between various criteria in their screening of investments, and that previous approaches fail to take this into account. Using conjoint analysis, Muzyka et al. conclude that venture capitalists would prefer to select an opportunity which offers a good management team and reasonable financial and product market characteristics, even if the opportunity does not meet the overall fund and deal requirements.

These last results are consistent with Wright and Robbie (1996) who show that venture capitalists place considerable emphasis on the specific attributes of a potential investee company both in relation to assessment of its value and the rate of return to be expected from it. While accounting information is an important element in deal screening and in arriving at a valuation and a target rate of return, venture capitalists place most emphasis on very detailed scrutiny of all aspects of a business, typically including sensitivity analysis of financial information, discussions with personnel and accessing considerably more information of an unpublished and subjective kind. This use of information is quite different from that found in studies of investment analysts dealing with quoted companies (e.g. Arnold and Moizer, 1984).

There is some debate in the US literature about the extent to which the use of non-accounting information varies between stage of investment (Elango et al., 1995; and Fried and Hisrich, 1994). There appears to be greater consensus that later stage investors will be more interested in market acceptance of a product. Early stage investors emphasise a range of product strength and market growth characteristics, particularly as early stage transactions are technology based with little available data on market acceptance.

Valuation and Due Diligence

Standard corporate finance theory states that the return an investor seeks on an investment is a function of the non-diversifiable risk of the investment (Brealey and Myers, 1996). According to CAPM, the required return should be positively related to the long term, risk free interest rate and to the difference between the expected return of the stock market and the long term, risk free interest rate. DCF and discounted dividend yield methods whilst theoretically correct pose particular problems in a venture capital investment context. With the DCF approach it is difficult to forecast future cash flows in the typically highly uncertain environment of a start-up, so that the expected error of the forecast will increase. It may be difficult to apply the dividend yield method to early stage investments which rarely pay significant dividends. The expected increase in the value of the venture is thus unlikely to be reflected in the dividend stream at least in the short term, though a significantly higher value may have been generated at the time of the exit of the venture capitalist. Options theory offers a potential interesting theoretical development in respect of the valuation of venture capital investments since much of the value is derived from options being created on the future growth of the investment as a result of new opportunities. Venture capital investments give rise to two types of options. The multi-stage nature of venture capital investments, see below, presents an opportunity to invest now with the option of investing further at a later date. The investor has no obligation to make subsequent investments but can wait until new information reveals the true nature of potential benefits. Since further investment is a right not an obligation, the investor possesses a valuable option on the value of the investee. A second type of option arises from the nature of venture capital projects since investments in company-specific knowledge may result in future cash flows that either far exceed initial outlays or total loss, either of which may be difficult to predict. Dixit and Pindyck (1995) show that options theory has clear implications for the raising of venture capital since financial market participants will place greater value on the investments which create options and be more hesitant to finance those which exercise options. Thus as new technology projects proceed from exploration to production, hurdle rates will rise and venture capital becomes more difficult to raise.

Evidence suggests that venture capital projects are typically valued by applying one or more valuation techniques to the financial and accounting information relating to the potential investee typically contained in the business plan submitted by management to the venture capitalist (Wright and Robbie, 1996). Forward looking information in the Business Plan may be subject to sensitivity analysis both by management and their advisers and by the venture capitalist according to the expected influence on future performance of other information. Most importance appears to be attached to price earnings multiples based valuation methods (Wright and Robbie, 1996), particularly among later stage investors, but with greater emphasis on DCF based methods than is the case for assessment of quoted companies by investment analysts (Arnold and Moizer, 1984). The process is likely to involve several iterations based on assumptions about the future trend in performance to test the robustness of the point at which the proposed venture meets an acceptable IRR, the most common measure of performance used in the industry (Murray, 1991). Dixon (1991) using data relating to the buoyant economic conditions of the late 1980s suggests that little scrutiny of information to assess risk and adjust target IRRs takes place. However, Wright and Robbie (1996) indicate that by the early-mid 1990s venture capitalists were undertaking widespread assessment of risk. Moreover, Murray and Lott (1995) show that venture capitalists perceive technology based projects to be more risky than alternative later stage projects and use a higher target rate of return in assessing them, but also that the stage of financing is significantly more important in determining project risk than the state of technology involved.

A variety of issues broadly categorised as time restrictions, cost constraints and situational factors, may directly impact the level of due diligence during an acquisition process (Harvey and Lusch, 1995). Evidence from buy-ins (Robbie and Wright, 1996) identifies a major problem related to the ability to obtain adequate up to date information concerning the target company. While due diligence is expected to be undertaken in a thorough manner, its cost in relation to transaction value in smaller buy-ins and time constraints in negotiations, meant that this ideal was difficult to achieve. There are indications that venture capitalists have adapted to such asymmetric problems through recent developments involving hybrid inside and outside management and investor buy-outs, where there is direct negotiation between vendors and venture capitalists.

Deal Approval and Structuring

Appropriate structuring of venture capital investments has important implications for the ability of venture capitalists to earn their target rates of return. Sahlman (1990) shows that venture capitalists use various mechanisms to encourage entrepreneurs both to perform and to reveal accurate information.[14] These mechanisms include staging of the commitment of investment funds, convertible financial instruments ('equity ratchets') which may give financiers control under certain conditions, basing compensation on value created, preserving mechanisms to force agents to distribute capital and profits, and powers written into Articles of Association which require approval for certain actions to be sought from the investor(s).

Theoretical work by Chan et al. (1990) provides a two-period agency model to explain the nature of these venture capitalist contracts. Venture capitalists are assumed to be competitive and risk neutral while entrepreneurs are considered risk averse. Both parties are assumed to have the skill to control production, but the entrepreneur's skill is unknown at the time of the contract negotiation and capital investment. In the first 'developmental' phase of the project a cash flow is generated and reinvested in the project and it is this which reveals the entrepreneur's skill to the venture capitalist. Based on this information, the venture capitalist determines whether to allow the entrepreneur to control the project for the second period or to transfer control to the venture capitalist. The cash flow produced at the end of the second period is shared between the two parties in accordance with initially agreed contracts.

Although the authors point out that their results are likely to change little if assumptions about the certainty of external factors are relaxed, their assumption that the venture capitalist can run the project if the entrepreneur fails to perform raises important issues. Since one of the key issues in such investments concerns the specific skills of the entrepreneur, the notion of venture capitalists being able to control production requires some explanation. There are doubts about whether venture capitalists have the skills to control production at the detailed operational level where the entrepreneur's skills may arguably be most central (Gorman and Sahlman, 1989). Evidence (see below) suggests that they intervene primarily at the strategic level and that this is very limited because of resource constraints. Venture capitalists may take control of the project from the entrepreneur but need to find a further entrepreneur with the requisite skills to control the project; this in itself raises further problems.

An important feature of many venture capital investments, especially early stage ones, is the staggering of financing into several rounds. Staging of investments, however, can lead to myopia and over-investment where initially entrepreneurs and subsequently first round venture capitalists as insiders present misleading information to outsiders in an attempt to persuade them to invest. An important theoretical issue arises which concerns how contracts are to be structured under these conditions of multi-stage investment decisions.

Cooper and Carleton (1979) develop a model of optimal continuation decisions in a multistage venture capital project in which the venture capitalist is the sole provider of funds throughout the life of the project. Both the venture capitalist and the entrepreneur make decisions at each stage about whether to continue to the next stage. However, Cooper and Carleton do not consider the possibility of asymmetric information nor the potential role of the venture capitalist as an intermediary between the entrepreneur and outside investors.

Admati and Pfleiderer (1994) in attempting to address the issue of agency problems in the continuation decision provide one of the few rigorous theoretical studies in the existing venture capital literature. Their model assumes three investment stages: initial access by the entrepreneur to a project requiring immediate investment, which requires additional investment in the second period; successful financing in the first period leads to a second period in which additional funding must be made if the project is to continue; and if the decision to continue is made in the light of information becoming available, the total payoff is realized in the third period.

The authors initially assume risk neutrality, which is later relaxed, no discounting, limited liability, a competitive capital market and asymmetric information. Two possibilities are considered for the entrepreneur to obtain financing. First in an entrepreneur-led financing, the entrepreneur approaches outside investors in each of the two investment stages. Alternatively, the entrepreneur can involve a venture capitalist who provides all of the finance in the first stage and some of the capital needed in the second stage. If financing is entrepreneur-led, the state of the world is observed only by the entrepreneur. If financing is provided by a venture capitalist, both the entrepreneur and the venture capitalist are assumed to observe the state of the world. Other providers of finance in the second stage do not observe the state.

Admati and Pfleiderer's analysis shows that with venture capitalist financing a contract in which venture capitalists continue to maintain the same fraction of equity in the various rounds of financing a project can neutralize a venture capitalist's incentive to mislead. With entrepreneur-led financing this situation does not hold as there does not exist a fully revealing signalling equilibrium which would resolve asymmetric information problems. Relaxing the assumption of risk neutrality in the case of venture capital financing requires the contract to be designed to address risk-sharing issues.

With a fixed-fraction contract, it is possible to vary the division of pay-offs between entrepreneurs and outside investors who put up capital in the second stage as opposed to the initial venture capitalists. The entrepreneur's risk can be reduced by giving outside investors warrants which can be exercised in the event of high pay-off realisations to give outside investors a large share of the equity and vice versa in poor performance situations. Syndication in the first stage of the project can also be a means of sharing risk; the lead venture capitalist as inside investor being given a fixed-fraction contract and making the continuation decisions, while syndicate members are given securities which reduce the risk of the entrepreneur. Admati and Pfleiderer argue that this analysis is consistent with the notion that venture capitalists often form syndicates with different types of contracts and different responsibilities with respect to monitoring for different capital providers. Bygrave (1988) finds that an important reason for syndication is to share information to reduce uncertainty and that this may be as important, if not more important, than the spreading of financial risk. Lerner (1994a) also finds support for this view and for the argument that typical later-round syndication involves less experienced venture capitalists investing in a deal begun by established organisations. Given issues relating to effecting post-contractual monitoring, to which we return below, the extent and nature of syndication may be dynamic. Venture capitalists may in effect search over time for a network of syndicate partners with whom they are able both to complete transactions and undertake effective monitoring. This aspect of syndication has received little research attention.

Admati and Pfleiderer focus on the benefits of venture capital financing but omit consideration of the costs of monitoring venture capital projects. They also ignore the costs of information gathering by the venture capitalist, which may be significant notwithstanding signalling behaviour by the entrepreneur. A commitment to fixed-ratio contract over subsequent rounds may be problematical where initial venture capitalists seek to exit early (e.g. because of the demands of their limited-life funds providers). It may also be argued that even at the second stage of funding the original venture capitalist may experience a significant asymmetric information problem. Though something of an insider from the earlier round(s), this is likely to be imperfect given the constraints on venture capital executives' time and the involvement of venture capitalists at a more strategic rather than operational level. This problem suggests that the asymmetric information problems which arise at the time of the initial intervention of the venture capitalist are unlikely to be fully resolved. Indeed, although the authors assume no asymmetric information between the entrepreneur and capital providers at the first stage it is often precisely at this stage that asymmetric information exists.

Since monitoring is costly and cannot be performed continuously the venture capitalist will periodically check the project's status and preserve the option to abandon at each stage. Sweeting (1991a) and Mitchell et al. (1995) show that part of the contractual measures adopted by venture capitalists are accounting information demands which are designed to deal with moral hazard and information asymmetry problems and provide safeguards through bonding arrangements. Accounting information flows were typically required on a more regular and more detailed basis than are statutory requirements for quoted companies.

Gompers (1995) and Gompers and Lerner (1994) examine agency and monitoring costs in the staging of venture capital investments. They find evidence to support the view that the monitoring process provides valuable information which enables the venture capitalist to cut off new financing in the light of negative information about future returns and provide more financing and a greater number of rounds of financing in the more successful transactions. However, they also note that though venture capitalists periodically check-up on entrepreneurs between capital infusions, entrepreneurs still have private information about the projects they manage. Hence, the nature and effectiveness of the monitoring process, which we examine below, is of considerable importance.

Little theoretical attention has been devoted to the range of financial instruments used by venture capitalists. Norton and Tenenbaum (1992) find that venture capitalists favoured the use of preference shares regardless of the presence or absence of deal specific influences, and that the use of debt was consequent on expectations that the investment would shortly generate taxable income, would have collateralizable assets, would have products resistant to the economic cycle and that the investment was more likely to be later stage. A follow-up study (Norton and Tennenbaum, 1993) examines the link between financing structures, financing stages and venture capitalists' characteristics. They find that smaller less diversified venture capitalists make greater use of ordinary equity instruments, but the use of preference shares did not increase in higher risk (early) stage investments nor did investors who were subject to greater amounts of unsystematic risk make greater use of preferred instruments.

A particular theoretical and practical problem concerns the consequences of the venture capitalist and the entrepreneur failing to agree on the degree to which the venture will be profitable, with consequent implications for the split between the equity stake attributable to each. Such differences may arise because of differing views of an uncertain situation and because of the agency cost problem when entrepreneurs own less than all the equity (Jensen and Meckling, 1976). Chua and Woodward (1993) suggest that this problem can be addressed through the use of stock options in the financing structure which provides entrepreneurs with an incentive to perform since they increase the cost to the entrepreneur of excessive consumption of perks. Similar devices have been used extensively in practice, termed 'equity ratchets' in the UK. Available evidence suggests that they may pose major problems in terms of specifying (relatively) complete contracts concerning the definition of financial performance to be used, manipulation of information by managers, and the timing of their crystallisation[15] (Thompson and Wright, 1991). These problems may lead to major relationship difficulties between the venture capitalist and the entrepreneur.

Post-Contractual Monitoring

- General

As noted above, post-contractual asymmetric information problems have major implications for the nature and effectiveness of venture capitalists' monitoring of investments. The agency theory perspective adopted above focused on the contractual structures involved in monitoring. However, an important aspect of monitoring concerns the relative roles of contractual mechanisms and processes.

Barney et al. (1989) examine the influences on the degree to which elaborate governance mechanisms are used by venture capitalists and found that high agency risks and business risks were associated with more elaborate governance structures. In a complementary paper, Sapienza and Gupta (1994) focus on the processes of monitoring by venture capitalists. In an important and innovative study which, unusually in this area, used matched pairs of lead venture capitalists and CEOs of investee companies, they find using US data that the frequency of interaction between the two parties depends on the extent of the CEOs' new venture experience, the venture's stage of development, the degree of technological innovation being pursued and the extent of goal congruence between the CEO and the venture capitalist. Contrary to expectations they find that the degree of management ownership had no impact on the frequency of interaction. This study's findings are of interest since they show that even with goal congruence, in an uncertain new business environment, signals regarding the appropriate course of action may be weak, leading to expectations of disagreements between investors and investees and a need for greater exchange of information to identify the appropriate course of action. Moreover, the finding concerning the effect of management ownership suggests that where a high level of managerial ownership is present, there is little reason to expect incentive-related shirking so that further adjustments to incentive mechanisms may be ineffective. The need for interaction is emphasised as the idiosyncratic knowledge possessed by the venture's founders may be virtually irreplaceable (we return to this issue in the next sub-section). A subsequent four country study which included the US data plus data from the UK, France and the Netherlands suggests that some of these results may be country specific (Sapienza et al., 1996), thus emphasising the need to understand the inter-linkages between the nature of the venture capital environment and appropriate monitoring mechanisms and processes.

A number of other studies have examined the links between the process of monitoring and the choice of the venture capitalist, the demands of a particular investment situation, the skills level of venture capitalists and the stage of the investment.

MacMillan, Kulow and Khoylian (1989) show that differing levels of involvement in venture capital investments was not related to the nature of the operating business but to the choice exercised by the venture capital firm itself as to the general style it wished to adopt. There were, however, no significant differences in the performance of businesses subject to differing levels of involvement. Sapienza et al. (1992) provide evidence that there is less involvement by venture capitalists in monitoring activities which are more developed and presumably less risky. Elango et al. (1995) identify three levels of assistance by venture capitalists in their investees, but surprisingly, they find that this involvement is not primarily related to the stage of investment. However, there were major variations in the amount of time spent and severity of actions taken by different venture capitalists on problem investees. Barry (1994) cites evidence that venture capitalists intensify their monitoring activities as the need dictates. Venture capitalist representation on the board is found to increase around the time of chief executive turnover, while the number of other outsiders remains constant, according to evidence from the bio-technology industry, i.e. an early stage sector (Lerner, 1995).

Rosenstein et al. (1993) find that the value added by venture capitalists on the investee's board was not rated significantly higher by CEOs than that of other board members and that entrepreneurs valued venture capitalists with operating experience more than those with purely financial expertise. However, Murray (1994) shows that finance was the only area where venture capitalists skills were judged by entrepreneurs to be greater than those of other parties. Indications are that the general type of skills possessed by venture capital executives varies between types of venture capitalist, with those employed by captive funds tending to be more financial skills oriented whilst those employed by independents tend to have greater industrial skills (Beecroft, 1994).

Sweeting (1991a) and Hatherly et al. (1994) for the UK and Fried and Hisrich (1995) for the US provide evidence of the importance of flexibility through personal relationships in the governance of venture capital and buy-out investments and that formal power needs to be used sparingly and almost only when things go wrong to be effective. However, this may be because of inertia rather than a deliberate policy. While venture capitalists may take control when things go seriously wrong, such action has to be exercised with care since to act precipitously may destroy carefully nurtured relationships and commit the venture capitalists to unknown amounts of time to put matters right. We return to the issues in dealing with problem investments below.

Similarities but also differences emerge in the operation of active investor governance in buy-outs and buy-ins. UK evidence from both buy-outs and buy-ins shows that board representation is the most popular method of monitoring investee companies with venture capitalists also requiring regular provision of accounts (Robbie, Wright and Thompson, 1992), but that there is a greater degree of control exercised by institutions over management buy-ins than for buy-outs especially in the form of greater requirement for regular financial reports and greater use of equity ratchets. Evidence from smaller buy-ins suggests that even where they have non-executive directors, institutions may not be as active in responding to signals about adverse performance as might have been expected (Robbie and Wright, 1996) and that relationships between entrepreneurs and investors had not developed to the extent that potential crises could be identified and understood by the venture capitalist. These problems reflect the high cost of monitoring and control in relation to the value of investments. In larger buy-ins there is evidence of extensive and repeated active monitoring (see Wright et al., 1994). This difference illustrates the comparative cost-effort-reward trade-offs involved in the active monitoring of large and small investments.

There is, however, a major issue as to the extent to which agency theory is the most appropriate theoretical tool for understanding the monitoring relationships between entrepreneurs and venture capitalists, or whether it requires some adaptation given the particular conditions of venture capital investments. In general, legal forms are able to facilitate exchange relationships. Thus contract law specifies a general set of arrangements under which goods and services are exchanged for money. The universal recognition of these norms, backed up by sanctions, economises on the costs of writing complex contracts. A potential complementary development to principal-agent theory associated with contracting problems is offered by procedural justice theory (Korsgaard et al., 1995). Procedural justice constitutes a behavioural standard for those in stewardship positions with respect to assets and is concerned with exchange relationships in which one party does not have control over decisions. The essential argument is that regardless of the outcome of decisions, individuals react more favourably when they feel the procedure used to make them was fair. The theory has clear parallels to the situation faced by the indirect involvement by venture capitalists in the operations of investee firms. Though venture capitalists may make considerable contributions to investee firms through the presence of non-executive directors and other monitoring devices, it is the entrepreneurs who control the way in which funds are used, who develop the strategies to achieve the returns that venture capitalists are seeking and who possess intimate inside information on the operation of the business. The venture capitalist seen as a principal may not therefore be in a position to control the nature and level of governance over the entrepreneur as agent.

Procedural justice can also be viewed as an important influence on the development of trust and commitment in relations between venture capitalists and entrepreneurs. This perspective links to agency theory in that the development of relationships may reduce uncertainty and ameliorate the need for costly monitoring as it reduces the need for formal mechanisms in the management of exchange relationships and may also reduce the perceived need to scrutinise data offered openly. This relationship may be considered in the context of the timeliness of information flows from an entrepreneur to the venture capital monitor. An absence or a persistent delay in the provision of information may be perceived by the venture capitalist as an unfair violation of an investment agreement and to undermine the investor's trust in the entrepreneur. Sapienza and Korsgaard (1996) use a procedural justice perspective to examine the impact of entrepreneurs' management of information flows on entrepreneur-investor relations. Using both an experiment with master's level students and a field survey of venture capitalists they identify the importance of timely feedback of information in promoting positive relations between investor and entrepreneur when the investors' influence on decisions is low. In other words, the more entrepreneurs share information, the more likely are investors to eschew monitoring, to trust that the entrepreneurs will be honest, to support the entrepreneurs' decisions and be more willing to reinvest. The use of an experimental approach in part of this study raises concerns about its generalisability and suggest that more large-scale studies directly involving entrepreneurs and venture capitalists are required. In addition, other procedural factors may be important other than feedback and influence, such as the entrepreneur's openness to the input from venture capitalist.

A procedural justice approach goes some way to overcoming some of the over-simplified assumptions of formal theoretical models which address agency problems, such as perfectly revealed information or no information. However, procedural justice theory focuses on the process of monitoring not the outcome.[16] There may be considerable trust, but performance may be sub-optimal. In addition, evidence from agency theory perspectives concerning the link between perceptions about entrepreneurs' skills and the nature of monitoring have so far been omitted from procedural justice approaches. Further theoretical modelling and subsequent testing of investor-investee relationships appears to require a synthesis of the insights from these two approaches to create a more robust analysis. Potentially fruitful directions may involve consideration of the implications for the relative importance of monitoring mechanisms which tend towards trust as one end of a spectrum and formal contracts at the other of assumptions relating to, for example, the complexity of projects, the degree of private information, the skills of the entrepreneur (both absolutely and relative to the venture capitalist), costs of monitoring and penalties for cheating.

- Restructuring and Failure

Particular importance has been attached to the governance role of active investors in cases where venture capital investments require restructuring. Ruhnka et al., (1992) find that 'living dead' investments, i.e. investments which are viable but fail to achieve adequate growth and returns, arise usually because of problems with management and markets. Ruhnka et al. find that successful turnround, which occurs in only 56 per cent of cases is influenced by the nature of the problem and the ability of venture capitalists to control them.

Subsequent research (Wright et al., 1993) has distinguished between 'Living Dead' and 'Good Rump' investments, where the former essentially involve enterprises where the business collapses with little prospect of turnaround and the latter are capable of being turned round, but the effects of restructuring have yet to be seen. A problem of enforcing restructuring is that it may be difficult to obtain consensus with other parties, both entrepreneurs and co-investors, what form it should take. In smaller investments, since management are usually important majority shareholders great care is needed in taking action. If institutions are a controlling shareholder, as is usually the case in larger buy-outs and buy-ins, making changes is theoretically straightforward. However, in cases with large syndicates of financiers, restructuring may be delayed or take a particular direction because of differences in the attitudes of syndicate members.[17]

In the limit, problems in the screening and control of venture capital investments may be expected to be closely associated with business failure. The influences on likelihood of failure in buy-outs in the UK was examined by Wright et al. (1995) who found that while positive managerial motives for buy-outs and greater levels of restructuring undertaken expeditiously at buy-out are associated with survival, direct investor monitoring per se was found not to be significant.

Investment Realization

Issues surrounding the exit or realisation of venture capital investments concern the timing and nature of such actions. Realization may be through IPO, full or partial sale to a third party, secondary buy-out/buy-in or receivership, with there being considerable variance around the mean period of investment in a venture capital project.[18]

An important point to emerge is that the timing and form of realization of venture capital investments requires the objectives of all parties to be satisfied (Relander et al., 1994; and Wright et al., 1994). Barry et al. (1990) indicate that venture capitalists have several mechanisms to ensure firms go public at times perceived to be optimal, including board seats and informal advice. Wright et al. (1994) writing in the context of venture backed management buy-outs suggest that institutions' desire for realization in order to achieve their returns, may influence the nature of corporate governance to achieve a timely exit. In order to achieve timely exit, institutions are more likely to engage in closer monitoring of their buy-out investments and to use exit-related equity-ratchets on management's equity stakes (Wright, Thompson, Robbie and Wong, 1995). Both quantitative and case study evidence suggests that the greater the conflicts in the objectives of the parties which had to be suppressed at the time of the transaction, the more the governance structure has to be able to respond and be flexible. Even so, exit arrangements will largely be influenced by the relative bargaining power between venture capitalists and entrepreneurs.

In the context of venture capital investments generally, most attention has focused on exit through IPO. Barry et al. (1990) show that successful timing of a venture-backed IPO provides significant benefits to venture capitalists in that taking companies public when equity values are high minimises the dilution of the venture investor's ownership stake. Barry (1994) cites evidence that venture capitalists' governance may be biased where they have incentives to offer bad advice to their investees in the matter of premature IPO timing. Such a potential reverse principal-agent conflict may arise where venture capitalists seek a premature IPO in order to gain profile and report prior performance in the raising of new funds.[19] Lerner (1994) shows that seasoned venture capitalists appear to be particularly good at taking companies public near market peaks, though of course this does not necessarily mean that such timing is appropriate from the point of view of the company itself (Wright et al., 1994).[20]

While there is evidence that unseasoned IPOs generally result in significant underpricing (see e.g. Ibbotson et al., 1988, for a review), Megginson and Weiss (1991), however, do show that there is less underpricing in venture backed IPOs, a finding consistent with a recognized role for venture capitalists as monitors.[21] Moreover, Jain and Kini (1995) whilst supporting this evidence, go further and show that venture capitalist-backed IPO firms have superior post-issue operating performance compared to non-venture capital backed IPO firms over a three year post-issue period. Importantly, they also show that the extent of superior performance is positively associated with the quality of venture capitalists' monitoring.

The valuation of venture capital investments at the time of exit may be particularly problematic since as Lam (1991) has shown, a venture capitalist may not be able fully to realise the value of an investment in a low information environment because of the existence of estimation risk, that is the incremental variation in the predictive return distribution that is attributable to investors' ignorance of the parameters of its true return distribution.[22] Estimation risk may be expected to decline as more information becomes known about the firm's performance. Thus, if part of the estimation risk is transitory and can be dissipated in the aftermarket following IPO then it is worthwhile for the venture capitalist to adopt a graduated policy towards the realisation of cash gains.

Despite this emphasis on realisation through IPO, venture capitalists maintain a flexible approach to the timing and form of exit (Wright et al., 1993; and Relander et al., 1994). Sale to a third party is often the most commonly preferred and actual form of exit. Relander et al. (1994) using European evidence show that although in principle IPOs may be the preferred realization route, in practice sale to a third party is the most common form used, principally because a threshold for an IPO is not reached or because an attractive but unforeseen acquisition proposal is received. Wright et al. (1993) show that venture capitalists' attitudes to exit are not homogeneous between European countries.[23] Petty et al. (1993) examine trade sales as an exit route for US venture capitalists and find that although it provides more immediate full liquidity of an investment than is possible in an IPO, the objectives of the entrepreneur may not be satisfied. Murray (1994) in a study of exit possibilities from early stage investments shows that venture capitalists rank trade sale as their preferred route with IPO third. Exit by sale to a next stage venture capitalist was ranked only fourth, despite early stage investors' expressed preference for such a form of finance. Murray expresses concern that young, growing firms may be faced by a second equity gap. Such companies may represent rather small acquisitions for trading groups seeking to obtain economies of scale and/or scope, though they may be attractive where purchasers are seeking to gain access to new technology or product innovations.

Entrepreneur's Exit and Assessment By Venture Capitalists, Post Exit Monitoring — Serial Contracting and Post-Exit Careers

The existence of entrepreneurs who are exiting from venture capitalists' own portfolios adds a feedback loop to the source of deal generation in Figure 1, and also raises interesting theoretical and empirical issues concerning recontracting. While we have earlier touched upon recontracting at different stages of the same project, this section focuses on the issue of the attractiveness of recontracting with exiting entrepreneurs especially given the importance accorded to entrepreneurs' track records in investment screening, as seen earlier. To date, the available literature has not addressed this dynamic aspect of venture capital investment. Although the screening literature in section (ii) above refers to previous entrepreneurial experience, it has not directly examined the problems faced by venture capitalists in assessing entrepreneurs who have exited from their own (and indeed others portfolios). As venture capital markets mature and increasing realization of investments is likely to be followed by exits by entrepreneurs, this would appear to be an area of growing importance.

Studies which have specifically examined cases of habitual entrepreneurship e.g. Birley and Westhead (1994) and Kolvereid and Bullvag (1993) generally find little difference in characteristics and performance between novice and experienced entrepreneurs. Starr and Bygrave (1991) suggest that although there is a danger that experienced entrepreneurs may become fixated on repeating past behaviour, the positive experience of previous entrepreneurial ventures should make it easier to raise start-up financing per se and in larger amounts. At the initial investment stage, venture capitalists may be able to negotiate relatively advantageous terms compared to entrepreneurs who are inexperienced in dealing with such situations, using their screening expertise as discussed earlier.[24]

Theoretical models reviewed earlier have examined the contracting problems in the presence of asymmetric information at either the initial stage of investment by the venture capitalist (Amit et al., 1990) or in relation to multi-period investment decisions (Admati and Pfleiderer, 1994). These models do not consider the issues of recontracting with the same entrepreneur in a different situation. This would seem to suggest that the nature of informational asymmetries differ from the initial contracting decision. In recontracting with entrepreneurs who have exited from their own portfolio, venture capitalists are potentially faced with a situation in which the entrepreneur is more aware of the effectiveness of the venture capitalist's monitoring and of how (dis)advantageous was the initial contract. Though the skills of the entrepreneur have been revealed to the venture capitalist, at least more so than in the first venture, assumptions about the nature of the entrepreneurs objective function (e.g. risk neutral/risk averse) may need to be amended since the outcome of the first project may affect the entrepreneur's motivations about subsequent ones. There is essentially a multi-period game whereby serial entrepreneurs and venture capitalists will seek to change either the invest/not invest decision and/or the nature of the contract in the light of information which has been revealed in the first project. As a result, venture capitalists, may be cautious about reinvesting in entrepreneurs from their own portfolios. Empirical evidence on recontracting with exited entrepreneurs shows that venture capitalists do indeed identify major differences between novice and serial entrepreneurs in the negotiation process as a result of their experience with the venture capital process (Wright et al., 1997).

With respect to entrepreneurs who have exited from other venture capitalists' portfolios, the contracting problem is more complicated as the entrepreneur now has knowledge about the venture capital negotiating process in general, though not of the venture capitalist to whom an approach is being made for the first time. While venture capitalists may know the entrepreneurs who have exited from their own portfolios, they are still faced by potential adverse selection problems in respect of entrepreneurs exiting from others' portfolios. Hence, venture capitalists may be more cautious about investing in such entrepreneurs because of both contracting problems relating to asymmetric information and the entrepreneur's knowledge of the negotiation process. In general, there would appear to be scope for further theoretical modelling of the recontracting process where venture capitalists are considering reinvestment in serial entrepreneurs.

An understanding of why entrepreneurs may cease to be entrepreneurs also has important implications for venture capitalists strategies to monitor entrepreneurs post-exit. Ronstadt (1986 and 1988) specifically examines the reasons why entrepreneurs exit early from their careers and provides evidence which suggests that at least some may have the potential for undertaking further ventures. Whilst this provides general evidence of the reasons for entrepreneurial exit, there is a need to examine more directly the implications for venture capitalists.

PERFORMANCE OF VENTURE CAPITAL FIRMS

The interrelated industry/market and firm level strands in the available literature on venture capital suggest that on the one hand, the returns earned by venture capital firms will depend on their ability to use their specific skills to overcome the information asymmetries inherent in privately held firms, but on the other that competitive forces shaping industry profitability will offset these returns.

Evidence of the target rates of return sought by venture capitalists ex ante (e.g. Dixon, 1991; Murray and Lott, 1995; and Wright and Robbie, 1996) shows that in the UK, the overall average internal rate of return sought on venture capital investments is around 29 per cent and that these target returns vary according to the stage of the investment, and the size and the degree of technology risk involved in the project.

There is relatively little rigorous analysis of the performance of venture capital firms. Outside of the US this is partly because of the relative newness of most markets where venture capital portfolios have not generally reached maturity. A major problem also arises in respect of access to adequate data.

A review of the main US literature to 1987 by Bygrave (1994) concludes that

> contrary to the folklore figure of 30–50 per cent, actual venture capital returns have most often been in the teens, with occasional periods in the 20–30 per cent range and rare spikes above 30 per cent.

Bygrave's own study of the performance of funds formed in the period 1969–1985 shows that the median IRR peaked in 1982 at 27 per cent and that early stage funds had higher returns than later stage ones.

Kleiman and Shulman (1992) examine the comparative performance of publicly traded venture capital firms and government sponsored small business investment companies and find that for 1980–1986 the latter demonstrate significantly greater total and unsystematic risk and greater returns on a risk adjusted basis, but significantly less systematic risk, than the former. However, this difference disappears for later years. An analysis of 33 quoted European venture capital firms during the period 1977–91 (Manigart et al., 1993) showed only eight of the sample with a return higher than the market return although the systematic risk was lower than the market risk. Venture capital companies which specialised in a specific investment stage had a higher return.

In Europe, the sensitivity of returns information has led to analyses being conducted by national venture capital associations. Though these studies provide some data there is a lack of transparency in the process of analysis. Dutch venture capitalists earned an average annual return on investment of 13 per cent for the period 1986–1990. However, these figures are based on realisations only and ignore the value of portfolio companies which have not been realised and which may be expected to lower these returns. The Dutch analysis, in contrast to US evidence, showed that early stage finance was on average loss-making (−3 per cent annual return) compared with the much less riskier management buy-outs which earned a high positive return of 25 per cent per year. Analysis of returns in the UK for a sample of funds launched between 1980 and 1990 show an overall annual return to the end of December 1994 of 12.1 per cent, with the upper quartile earning 14.6 per cent, and large MBO funds producing the highest returns at 23.1 per cent and early stage 4 per cent (BVCA, 1995b). Funds raised in 1986 and 1987 were the worst performers while the best ones were raised in 1985 and 1990, reflecting the effects of differing market conditions notably the entry price/earnings ratios paid for investees. Unlike the Dutch study, but in line with US approaches, the UK analysis was based on all investments not just exited ones and relates to the performance of funds not companies.

It is clear from these studies that returns depend to a great extent on the stage of investment and the timing of the raising of the fund and have generally fallen internationally since the market began to develop significantly from the early 1980s. Moreover, it is also the case that the bulk of returns are earned on the top decile or quartile. Huntsman and Hoban (1980) show that eliminating the top decile meant that the average return fell from 18.9 per cent to −0.28 per cent. In Bygrave's study, the top quartile funds peaked at 44 per cent. It is also notable, if not perverse, that funds involving the lowest risk categories earned the highest returns.

CONCLUSIONS

The main thrusts of this review have been to emphasise the richer array of research issues which arise from focusing on the wider range of investment activities actually undertaken by venture capitalists and to identify the inter-linkages and gaps in the current literature. Not only does this approach key in more closely to the nature of the venture capital and private equity market and what venture capital firms do, but it also permits greater application of important finance and accounting concepts and issues. Increasingly, at least in the UK and European context, it would seem important to view the issues as relating to the provision of private equity, within which pure venture capital is a sub-set.

This review has presented for the first time an integrated examination of both industry/market and firm levels issues in order to provide a fuller understanding of the venture capital market. The review indicated that although there is considerable work on various aspects of the venture capital process, there is relatively little work at the industry/market level. There has also been relatively little attention to explicit examination of the inter-linkages between the industry/market and the firm level issues.

Perhaps most importantly, this review has indicated that the developmental formal theoretical models have been at best partial and that much of the empirical work in this area has been somewhat atheoretical. Formal approaches have attempted to model the problem of asymmetric information and have provided insights into the nature of venture capital contracts, contracting in multi-stage investment decisions, and the problems associated with the venture capitalist's ability to identify, attract and invest in high ability entrepreneurs. However, there are a number of areas where simplifying assumptions may have meant that the full essence of a particular aspect of the venture capital process has not been captured. Particular gaps where further work would appear warranted, concern for example, the modelling of perfect versus imperfect revelation of information at the screening and post-contractual monitoring stages, the costs of information search by the venture capitalist, the use of performance contingent contracts as a means of dealing with asymmetric information, the consequences of venture capitalists not being able to control production if the entrepreneurs are replaced and the development of bargaining models of contract negotiation.

Consideration of these issues appears to be an important aspect of the future research agenda given the dynamic nature of venture capital markets and its implications for the behaviour of venture capital firms. Following the structure of the preceding review, the following suggestions emerge for areas for further research.

Industry and Market Level

- Rivalry Between Firms

The determinants of rationalisation and mergers within the industry may be expected to involve some differences in comparison with traditional manufacturing sectors. For example, when a closed end fund is fully invested the venture capital firm can continue to operate for several years without making further investments. Issues are also raised concerning the incentives for other venture capital firms and others to acquire such companies.

Given the importance of individuals' skills in venture capitalist firms, more mature markets begin to raise the issue of the impact of CEO succession and executive turnover on future fund performance. This issue is widely addressed in the general literature on succession in privately held firms (see e.g. Kets de Vries, 1977) as well as in the corporate control literature (see e.g. Walsh, 1988) but has yet to be examined in the context of venture capitalists.

- Power of Suppliers of Funds

The effects on the strategies of funds' suppliers of evidence on the performance of previous funds is of particular relevance in a market where venture capitalists are seeking to raise subsequent funds. This has major implications for the developing structure of the industry as weak performers may not be able to raise further funds. Institutional developments affecting funds providers may in turn affect their stance towards investing in venture capital. For example, solvency ratio requirements for pension funds and their ability to recognise venture capital as an asset class may affect their willingness to hold venture capital investments, especially in more difficult market conditions. In this context, access to transparent performance information is likely to have important implications for the extent and direction of their investment in venture capital firms, including the linking of fund performance to the compensation incentive structures of the venture capital limited partnership or firm.

- Power of Customers

As seen earlier, some attention has been paid towards the demand and search process of entrepreneurs seeking venture capital. However, issues concerning the influences on venture capital search such as the size and investment stage of the transaction and the background experience of the entrepreneur lack systematic analysis. Research which analyses and compares the differing perspectives of entrepreneurs, intermediaries and venture capitalists could provide important insights into both the deal search process and for deal generation by venture capitalists (see below).

- Threat of New Entrants

The mirror image of exits concerns the incentives for and barriers to entry by new competitors. Differing stages of market maturity introduce possibilities for comparative analysis of these factors. More specifically, the scope and prospects for new entry by internationally based venture capitalists, spin-outs from existing firms, tax driven incentive schemes (e.g. Venture Capital Trusts in the UK) and for direct and indirect investment by high net worth individuals, offer potentially important research possibilities.

- Threat of Substitutes

Further research areas concern examination of the extent to which venture capitalists and venture capital backed firms are different from other institutions and firms. Moreover, as much of the existing work has either been confined to US conditions with an emphasis only on start-up investments or has related to much earlier time periods, there is scope for further research beyond these areas. There is also relatively little existing analysis of how firms select between competing sources of finance from banks, and formal and informal venture capitalists, nor is there evidence concerning the complementarity between these sources of finance.

Firm Level

- Funds Providers-Venture Capital Firm Relationships

Growing evidence on the mechanisms and processes by which venture capitalists monitor their investee companies has shed important light on principal-agent issues.[25] However, there has been relatively little research on the other crucial principal-agent relationship, that between venture capitalists and their funds providers. There is little research on the comparative approaches of limited partnership venture capital funds and captive funds to monitoring relationships, investment stage and time horizon emphasis and overall objectives. In addition there is an absence of analysis of the operation and effectiveness of venture capital contracts from the perspectives of venture capitalists and their funds' providers. There would thus appear to be scope for more detailed finance-based clinical studies of the processes involved in the operation of venture capital contracts.

There is also a major issue concerning the appropriate conceptual underpinning to empirical examination of relationships. As seen above, a potential complementary development of principal-agent theory is offered by procedural justice theory. The theory has clear parallels to the situation faced by the indirect involvement by funds providers in the operations of venture capital firms as well as to relations between venture capital firms and their investees as discussed above. Though funds providers may have made considerable contributions to venture capital funds, it is the venture capital executives who control the way in which funds are disbursed and strategies adopted to achieve the returns that funds providers are seeking.

- Deal Generation

Little systematic research has been devoted to deal generation yet it raises issues concerning both the allocative efficiency of the venture capital market and the performance of firms. For example, differences between regional concentrations of venture capital funds and entrepreneurial opportunities may mean that certain ventures may receive funding in one region whereas ventures with the same characteristics in another region may not. Hence, research which examines the implications of regional concentrations of venture capitalists, the effectiveness of their regional networks (including both regional offices and the role of intermediaries) and the response of venture capitalists to opportunities which arise because of such market imperfections, may be of interest.

A further issue concerns the appropriateness and net benefits of reactive versus proactive approaches to deal generation. Changing competition in the industry has implications for the generation of deals, one manifestation of which has been the development of new types of transaction such as investor-led buy-outs where the venture capitalists' role is enhanced. Evidence and experience in earlier market development suggests that there is a need to examine carefully the implications of new methods of deal generation and the new types of deal which may be involved for the skills required to venture capitalists, adverse selection and moral hazard problems and ultimately for the performance of venture capital firms.

Links between differing sources of funds may also have important implications for deal generation and require examination. For example, informal venture capitalists may have an important role to play in funding early stage projects prior to formal venture capitalists entering at a later stage. The development of new secondary and tertiary tier quoted markets (such as NASDAQ in the US, AIM in the UK and EASDAQ in Europe) may provide an alternative source of funds for growing firms and offer competition for venture capitalists.

- Initial and Second Screening

There is now extensive empirical evidence on the screening process, particularly in respect of new ventures but less so for later stage investments. Much of the recent research in this area has focused on refining techniques addressed to established research questions. There would appear to be a need for further work which examines differences between types of transaction stage and screening characteristics as well as direct examination of the links between screening characteristics and subsequent performance, and of whether or not deals rejected by one venture capitalist are funded by another or by an alternative funder or not funded at all. Further theoretical work would appear warranted on the problems of imperfectly revealed information and the costs incurred by the venture capitalist in obtaining information. Theoretical work might also address screening issues for differing stages of venture capital investments (e.g. early versus late/buy-out stage).

- Valuation and Due Diligence

Little work is available on valuation in venture capital investments, particularly relating to international comparisons in markets at differing stages of development. Given the indications from the research which is available that there are differences between venture capital investments and other forms of investment, and the link between valuation at this stage and post-investment valuation (see below), this would appear to be an important issue.

There is also a paucity of evidence concerning the due diligence process. Recent work referred to above is based primarily on the situation concerning acquisitions with there being little evidence relating to venture capital situations. Moreover, the ability to carry out due diligence may differ between different stages of venture capital investment (e.g. for start-ups there may be little hard evidence, for later stage hard information may be available), and whether investees are insiders or outsiders and face competition in the bidding process (e.g. management buy-ins and investor-led buy-outs[26] versus management buy-outs and development capital transactions). A comparative analysis of these situations may identify important further dimensions of asymmetric information problems and issues which interlink with other stages in the venture capital process such as the implications for the structuring and viability of transactions.

- Deal Approval and Structuring

Although, as has been seen there are theoretical models which examine the structure of the venture capital contract, little work has been conducted on the bargaining process between entrepreneurs and venture capitalists. In some models, for example, it has been assumed that the entrepreneur has handed over to the venture capitalist the determination of the sharing agreement. Its determination through a bargaining process may be one useful extension of analysis in this area.

Although there is extensive evidence concerning screening criteria little empirical attention has been devoted to the deal approval process at the organisation level. This is potentially an important issue since individual venture capitalist executive decision-making takes place within an organisational structure which typically requires recommendations to be approved by an investment committee. Analyses of conditions where recommendations are accepted or rejected and of differences in the process according to type of venture capitalist and stage of investment would especially appear to be appropriate.

There is surprisingly little research on deal structuring in terms of the determinants of the combinations of the types of financial instruments which are used. Evidence from available studies that financial structures vary more according to the characteristics of venture capitalists and competition for the deal rather than of the investee itself is somewhat puzzling and would appear to warrant further research in respect of cross-country and cross-investment stage comparisons.

In the light of the review of industry level and firm level issues, further analysis is required of the trade-offs between greater risk spreading but weakened control actions in syndication in the context of increasing competition between providers, increased ability to fund larger transactions as good performers are able to raise larger funds, and differing economic environmental conditions.

- Post Contractual Monitoring

There is now quite extensive research on post-deal monitoring. The potentially interesting avenue for further research offered by the procedural justice perspective has already been referred to in respect of funds' providers-venture capitalists' relationships. The approach has similar applications in respect of venture capitalist-investee relationships. However, little of this research has related to the monitoring actions which are taken when investees are either performing well or facing major problems. In particular, there would appear to be a need for further research on the extent and effectiveness of monitoring actions in identifying problem cases, and the processes used to restructure such investments with comparative analysis between those that go into bankruptcy, and those that partially and fully recover. However, such research could well benefit from further theoretical modelling of the monitoring process. Although some tentative moves have been made in this direction with the introduction of procedural justice theory, significant gaps appear to remain in the formal modelling of the interplay between contractual mechanisms and monitoring processes.

- Investment Realisation

In respect of the realisation of venture capital investments, there is a need for greater attention than hitherto to venture capitalists' preferred form of exit, especially trade sales. In particular such issues as the pricing of such sales, the determination of an acceptable price (especially for under-performing investee companies) and the processes of the management of closed end fund portfolios and divestment from them would seem to warrant further analysis. Further analysis of post-IPO performance issues also appears warranted, particularly in respect of the influence of information asymmetry on the timing of IPOs and the question as to whether post-IPO venture capitalist involvement, either directly through director representation or through a shareholding presence, is positively associated with performance.

- Entrepreneurs' Exit and Assessment by Venture Capitalists and Post Exit Monitoring

These two stages are considered together as they both raise issues about recontracting between venture capitalists and entrepreneurs. There has also been little attempt to address the theoretical and empirical issues involved in the reinvestment in exiting entrepreneurs either by the original venture capitalist or an alternative one. This area would appear to introduce important issues concerning the problems of recontracting with entrepreneurs who have learnt about the venture capital process and which may change the relative bargaining position of the two parties. A similar issue also arises in staged investments where an investee company is growing successfully, giving the entrepreneur greater bargaining power. However, there is an important distinction in the two cases since the former involves a new project whilst the latter concerns the existing one. Formal modelling of this dynamic aspect of the venture capitalist-entrepreneur relationship remains a gap in the existing literature.

There is also a paucity of rigorous academic studies on the performance of venture capital investments and of the venture capitalists themselves. A subset of important issues also concerns the methods used in the valuation of initial venture capital proposals, the continuous revaluation of venture capital portfolios by both captive and independent funds and the implications of valuation policies for the ultimate realisation of investments and, as noted above, measurement of industry level performance.

• Inter-Linkages Between Stages in the Process

There has hitherto been relatively little work which has examined the nature and effects of the inter-linkages between the industry and firm levels of the venture capital market and in respect of the stages in the venture capital process. Some areas of inter-linkage have been identified in the preceding paragraphs and the following areas in particular may offer further potentially interesting research possibilities.

As noted in this review, some empirical work is now appearing which compares formal and informal venture capitalists in terms of their approaches to screening and monitoring, but there has been little which focuses on the decision processes by which entrepreneurs choose between these two sources.

There has also been little attention to the complementarity of informal and formal venture capitals. For example, there are issues which concern whether informal venture capital performs a greater role for smaller earlier stage projects with formal venture capitalists entering at a later stage when larger amounts of funds are required. In addition, there may be instances where the combined inputs of both formal and informal venture capitalists may be appropriate, for example where informal venture capitalists also bring technical skills.

Evidence is now available on the performance of different stages of venture capital investment. However, there has been little attempt to analyze systematically the determinants of the performance of venture capital firms, whether they are quoted or privately held, nor of schemes to encourage private equity investment which offer taxation incentives. The implications of emphases and different elements of the screening process, of monitoring mechanisms and of financing structures for performance is little understood. This may be especially important given the general absence of strong evidence concerning the efficacy of different approaches to post-investment monitoring. In respect of tax incentive schemes, issues are raised concerning the effects on investment decision making.

The general corporate governance debate has raised issues about the link between executive remuneration and performance (Jensen, 1993; and Keasey and Wright, 1993) and the venture capital industry would appear to provide a novel sector in which to address some of these issues. For example, comparisons of the performance of management rewarded through salary-plus bonus against those rewarded through salary-plus carried interest,[27] controlling for investment stage differences, etc. would be of interest. Access to information, however, poses particular problems for large sample studies.

Performance of Venture Capital Firms

Though, as reviewed above, there is some evidence relating to the broad performance of venture capital firms and to differences between the performance of investment stages, this is rather limited. Overall declining rates of return and evidence of the disparity in returns on differing risk categories raises important questions about market efficiency and the determinants of performance of relevance to researchers, practitioners and policy makers. These issues relate partly to the efficacy of the contracting technology which has been developed to enable value to be added to the venture capital process, but this is too narrow a basis to obtain an understanding of the operation of the venture capital market. Evidence on the comparative returns from different stages of investment may also be related to the skills of venture capitalists and continuing difficulties of accessing private information. These differences are especially marked between early stage and management buy-out type investments and prompt important research questions about the operation of the market. As indicated by the two level framework of analysis adopted in this paper, it is necessary to consider the effects of competitive forces in the venture capital market since, for example, competition between venture capital firms may increase the equity stakes obtained by entrepreneurs and drive down the returns available for venture capitalists. The evidence reviewed in this paper indicates that little attention has been devoted to analysing these inter-linkages and that further research in this area appears warranted.

Data availability poses severe problems for comprehensive analysis and existing studies may be difficult to compare because of inconsistencies in valuation methods especially in relation to unrealised portfolios. A relatively neglected data source concerns the possibility in some environments to analyze differences in performance between enterprises which have been supported by venture capitalists and those which have not.

The development of a venture capital price index could provide indicators of benchmark performance against which to judge individual company performance. It would also enable comparisons to be made with other stock market indices. Indices relating to venture-backed investments are now beginning to appear, such as the CMBOR Index covering management buy-outs. These raise questions about the continuing influence of venture capitalists when their interest has been diluted after flotation. A second category of indices concerns non-quoted venture backed firms, with increasing competition to obtain funds placing pressure on venture capitalists for greater transparency of performance information. Preliminary efforts in this area have been made by Keeley and Turki (1995) for example, but there would as yet appear to be significant problems stemming from data availability which need to be addressed.

Concluding Comments

So far, finance and accounting researchers have only addressed parts of the above research agenda. Partly this is because some of the areas relate to strategy issues, though as may be evident from this review the interface between strategy, finance and accounting offers interesting research avenues. The relative lack of attention is also partly because the nature of information in the area means that traditional finance and accounting research approaches are difficult to apply. The private nature of investments means a general absence of publicly available information. This may mean that qualitative in-depth research methods may be appropriate for addressing many of the areas identified above. The relatively small number of venture capital firms in most countries has implications for the extent to which these firms can be surveyed or otherwise contacted without leading to saturation and consequent small and potentially biased sample sizes. This suggests that other data sources may be appropriate, such as analyses of enterprises which have or have not been financed by venture capital. In sum we would argue that venture capital provides a potentially rich research agenda for researchers in the accounting and finance area.

NOTES

1 Detailed treatment of the newer literature on corporate venturing is seen as beyond the scope of this paper. For analysis see e.g. Block and MacMillan (1993). Informal venture capital is discussed as a competing source of private equity.

2 For such firms, an IPO may provide access to equity funds but little if any monitoring. Moreover, because of the problems of access to information and the skills possessed by institutional investors there may be a reluctance for them to purchase shares in these kinds of firms. It may also be noted that evidence relating to potential gaps in corporate finance research (Herbert and Wallace, 1996), suggests there is a need to give greater attention to the effects of the information asymmetries which exist between insiders and outsiders on decision processes in corporate finance. Following on from the second motivation, these asymmetries are likely to be greater for smaller firms, for whom Herbert and Wallace (1996) show there is a significantly greater need than for larger companies to provide research on appropriate sources of finance and the debt/equity financing choice.

3 We return to the possibilities of overlap below.

4 Prior to this more recent substantial market growth it needs to be borne in mind that the world's largest venture capital institution, 3i, based in the UK has however, been investing since the mid-1940s (Coopey and Clarke, 1995) whilst Charterhouse and other banks provided venture capital at least a decade earlier.
5 Later stage financings represented 94% of the total value of investments and 83% of the total number of financings made by members of the European Venture Capital Association (EVCA, 1995).
6 This can lead for example to an overemphasis on equity stake by entrepreneurs with the venture capitalist making counter-balancing adjustments in other aspects of the contract that an inexperienced entrepreneur may not fully appreciate and to insufficient search on the part of the entrepreneur for an appropriate venture capitalist. This is consistent with notions that entrepreneurs finding themselves in unfamiliar situations under-search for information as they fail to appreciate fully the issues involved or their complexity.
7 This is particularly an issue in the recent development of Investor-led Buy-outs (IBOs) where venture capitalists are proactive in seeking and completing deals. While this may to some extent reduce the power of incumbent entrepreneurs/managers in obtaining large equity stakes from the venture capitalist, venture capitalists are faced with potential problems arising from paying higher prices to invest and asymmetric information problems where they may have full unbiased information on the investee (see Wright and Robbie, 1996, for discussion).
8 Different types of business angels can be identified according to their behaviour and characteristics (see e.g. Mason and Harrison, 1992).
9 It is not clear, however, how representative these studies are. For example, 'more informed' informal investors may utilise their links with banks to identify investment opportunities rather than using 'marriage bureaux' and such entrepreneurs may therefore not be fully represented in these studies.
10 Wright and Robbie (1996) who examined only formal venture capitalists also find a high degree of importance is attached to own due diligence.
11 Though the LBO industry in the US is typically seen to be distinct from the venture capital industry, venture capitalists are extensively involved in funding buy-outs especially smaller ones (see e.g. Malone, 1989). In the UK, there is probably much greater overlap between venture capitalists and what may be seen as LBO Associations (Wright, Thompson and Robbie, 1996). Moreover, although there has been some reference to the rehabilitation of the US LBO, post the problems of the late 1980s, this has been a much stronger and persistent feature of the UK buy-out market where venture capitalists play a significant role. Venture capital widens the emerging literature on corporate restructuring which has hitherto tended to focus on debt forms of finance (Jensen, 1993), in particular in relation to the balance between the reduction of agency costs and the stimulation of growth and entrepreneurial actions. Although the corporate restructuring debate has tended to emphasise the former, there is evidence that a large number of management buy-outs in both the US and the UK make extensive use of venture capital and engage in significant R&D and investment expenditure (see e.g. Zahra, 1995; and Wright et al., 1992).
12 For example, in the UK management buy-out market, venture capitalists are involved in the funding of around a half of smaller transactions, with banks fully funding the rest (Wright and Robbie, 1995).
13 Hustedde and Pulver (1992) examine the important roles of different types of intermediaries in securing venture capital funds for their clients and find that entrepreneurs who failed to seek advice had a significantly lower chance of success.
14 In this respect, venture capital has an important contribution to make to the corporate governance debate as the involvement of venture capitalists in investee companies has implications for both performance and accountability simultaneously (Lorenz, 1989). Sykes (1994) also draws attention to the contribution that active investors in MBOs may have to the corporate governance debate.
15 Performance may be in terms of profits over a given period, market value on flotation, etc. Flotation at a date prior to that expected in the ratchet contract may provoke disputes about the extra amount of equity to which management are entitled where a sliding scale operates.
16 This parallels other behavioural research relating to the link between job satisfaction and performance.
17 See Lerner (1994) for a discussion of syndication of venture capital investments.

18 For the case of venture backed management buy-outs see Wright, Thompson, Robbie and Wong (1995).
19 This issue also raises further governance problems in relation to conflicts between venture capitalists and their investors.
20 Evidence from IPOs of buy-outs in the UK also indicates a marked increase in activity at times of market buoyancy (see Wright and Robbie, 1995).
21 Parallel evidence from reverse LBOs (DeGeorge and Zeckhauser, 1993) shows they outperform comparable firms in terms of operating profitability pre-flotation but not post; a finding consistent with the view that managers and their institutional supporters wait for a good year before coming to market. However, evidence that despite this change in relative performance reverse LBOs do not underperform the share price of non-LBOs suggests that the market anticipates such a change.
22 Estimation risk has transitory and permanent components. The former may be eliminated as more information becomes available while the latter is due to the random nature of asset return parameters.
23 However, it is worth emphasising that 40 per cent of IPOs in the UK in the period 7/92 to 12/95 were venture capital financed companies according to the British Venture Capital Association.
24 Although some entrepreneurs mitigate this problem with the use of intermediaries, there is evidence to suggest that intermediaries become involved at a late stage, especially in smaller transactions (Murray et al., 1995).
25 There may also be wider corporate governance applications of the flexible active investor approach adopted by venture capitalists (Jensen, 1993; and Thompson and Wright, 1995).
26 See Wright and Robbie (1996).
27 Carried interest relates to the participation of individual venture capital executives in the gains achieved by the externally provided funds they are investing in entrepreneurial ventures.

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