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Keskusteluaiheita – Discussion papers

No. 1032

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‘COACHING’ SMALL BIOTECH COMPANIES INTO SUCCESS: THE VALUE-ADDING FUNCTION OF VC*

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ABSTRACT: The paper reports an empirical study on the non-financial value-added provided by Venture Capital investors to their investee firms. This study will use a four-class grouping of the various non-financial value-adding capabilities provided by VC firms, namely, scouting, monitoring, signalling and value-adding services. The study examines biotechnology industry in Finland.

Finland has a dual system with independent (partially ever-green) VC companies and public or semi-public VC organisations. Additionally, informal VCs are fairly active. Whether the different types of VC organisation aim, are able and indeed do deliver non-financial value-added, in addition to their financial input, is the central focus of this study.

The paper has an evolutionary perspective on Venture Capital according to which VC promotes a variety of experimentation with new technologies, especially through the foundation of new firms oriented to experimentation and development of new ideas. At the same time, VC industry fulfils a selection function in its role as a financial intermediary.

The study data have been collected through interviews, conducted at the end of 2005, with the total population of small and medium-sized, VC-backed biotech companies established in Finland since 1986.

Central findings of the study include an observation that all three VC types did provide value-added in the meaning outlined above. Nevertheless, there were clear differences between them in terms of the overall perceived value-added as well as in their activity profiles. Informal investors were found to have the highest overall value-added and kept closest contacts with their investee firms.

Keywords: Venture Capital, Biotechnology

JEL codes: O16, G24, O38, L65

1. Introduction

The paper has an evolutionary perspective on Venture Capital (VC): Venture Capitalist is part of a larger selection environment that allows economic systems to change and to perform with regard to innovation and growth. An important function of Venture Capital is to act as a mechanism to support and select across variety in new technological opportunities and in transforming these into viable businesses. This function of Venture Capital is, first of all, related to its role as a financial intermediary. However, VC literature has referred to the value adding capabilities provided by VC firms to their portfolio companies with regard to management, headhunting, marketing, networking, certification and reputation. VC firms also claim to be a critical ingredient for the rapid international expansion of promising start up companies. In addition to these ‘coaching’ functions, VCs also act as ‘scouts’ to identify promising start-up ventures (Baum, Silverman, 2004).

In spite of a growing body of literature about the value-adding functions of VC, it is still not clear to what degree and under which conditions this ‘coaching’ function is in fact being performed by VC organisations and whether there is a difference by VC organisation type in performing this function. Whether the different types of VC organisation aim, are able and indeed do deliver a coaching function, in addition to their financial input, is an important question when European systems of innovation are under study.

A further question about the successful coaching function relates to the industry of investee companies. While the ICT Revolution provided demand for and profitable business opportunities for Venture Capital industries and thus greatly contributed to its emergence (Teubal, Luukkonen, 2006), it is unclear whether Venture Capital industry is equally successful in its coaching function in the Life Sciences industry. R&D processes are much longer in Life Sciences than in the ICT, and technological and commercial risks are exceedingly high, implying that successful Venture Capital activities in Life Sciences would require special competences and expertise, not easy to develop in a small country where Venture Capital industry is recent. Additionally, some of the basic assumptions underlying VC function – expectations of high returns within a short period of time – are not easily applicable.

The paper examines forms of value-adding services and potential differences in performance by different kinds of VC organisations¹ (public sector VCs, private sector VCs and informal VC, that is, business angels) in the Life Sciences area, more specifically, in biotechnology in Finland. As noted above, this area is especially demanding in terms of the competencies VC organisations need to possess if they are to perform their function well and earn money for the investors. The degree to which public sector VC organisations are able to implement hands-on strategies in the development of investee firms is important, given the central role such organisations have for early-stage financing of technology-based firms in Finland.

2. Evolutionary perspective on VC

In the evolutionary perspective, technological change occurs through the creation of diversity of inventions and through selection across diversity. In this process, the fundamental units of selection consist of the different ideas and learning patterns of individual firms facing the test of markets and competition. Thus competition in the markets provides the basic selection mechanism. There is a constant trial and error/experimentation with new technologies with regard to their application as potential business opportunities, and the continued supply of trial and error experimentation is important for the injection of variety to promote further (endogenous) growth (Fagerberg, 2003).

However, technology-based innovations – or firms – face selection mechanisms before they enter the markets. Many, even most, new innovative ideas are discarded before they enter the market. Their ‘fitness’, potential competitiveness (Dosi, Nelson, 1994) is not satisfactory in the intensive rivalry for new ideas and opportunities. There are regulatory requirements which, in some areas in particular, such as human drugs, are extremely stringent and require that all new product candidates pass a series of tests lasting many years. Most of the inventions will fail in their performance in this lengthy process. The regulatory system thus is an important part of the mechanisms screening out ideas that do not satisfy the basic requirements of performance set to technologies before these can compete for profitability on the product market.

¹ We do not pay attention to corporate VCs because there is little corporate VC activity in early stage investing and in this field in Finland.

Since experimentation with new technological inventions requires a lot of resources both in terms of money and business know-how (also taking into account that it requires a lot of intellectual capital in the technological domain), various funding institutions as well as so-called technology transfer mechanisms play a role in the promotion of variety and in the selection process. This paper draws attention to the role of a particular financing institution, namely Venture Capital, in this process.

Venture Capital is traditionally understood as ‘pools of money’, oriented to early phase finance and support of high tech start-ups². This definition includes a variety of organizational types besides independent organizations, namely those affiliated to financial institutions or to corporations, government-owned organizations, and individuals (business angels).

The authors adopt the view that, even though the first Venture Capital organisations in the US appeared long before the ICT Revolution, nevertheless, Venture Capital and related financial institutions really developed as a response to the requirements of the ICT Revolution for a wide experimentation of new technologies and related ideas (Teubal, Luukkonen, 2006). This experimentation created the demand for new financial institutions and financing arrangements which older institutions, such as banks, could not respond to.

Venture Capital was particularly suited for this new financial need because VC institutions emerged as a response to the basic dilemma of new technology-based firms, namely, the fact that these could not provide collateral for obtaining loans with their balance sheets mostly consisting of intangible assets. By adopting equity stake in the new ventures, VC was able to provide these with money for the development of their businesses and to act as a financial intermediary between investors and investee firms. Furthermore, new technology-based firms and their experimentation with new technological ideas were highly risky to the extent that traditional banks could not find them acceptable. VC could thus be regarded as an institution that through an evolutionary process emerged as a mechanism to “enable the rise of the new entrepreneurs” experimenting with the new technological opportunities (Perez, 2002, 73).

The growth and emergence of VC industry, the conditions under which these happen and the kinds of institutional variety this industry has given rise to in different countries is itself an important subject for study. In this paper, we only draw attention to the

² This is a strict definition compared with Lerner, who defined VC as “independently managed dedicated pools of capital that focus on equity or equity-linked investments in privately held, high growth companies” (Gompers and Lerner, 1999, p. 349).

fact that an independent limited partnership company became the dominant design of VC industry in the US and Israel (Avnimelech, Kenney, Teubal, 2005), while in many countries, in Europe in particular, different institutional variants have co-existed or been dominant. For example, in Finland, there is a dual system with independent (partially ever-green) VC companies and governmental or semi-governmental VC organisations. Even though the nature of VC institutions and the evolution of the VC industry – or not – is not the topic of this paper, the institutional variety plays an important role and this paper draws attention to the ability of different institutional forms to provide value-adding services to their portfolio firms.

To summarise, within the evolutionary perspective, the major function of VC industry is to promote variety of experimentation with new technologies, especially through the foundation of new firms oriented to experimentation and development of new ideas. At the same time, VC industry fulfils a selection function because it provides resources (financial and non-financial) to some of the new technology-based firms presumably enabling these to perform better as compared with firms that do not obtain VC funding and support. There are a number of research results indicating benefits in economic performance of VC-backed firms as compared with non VC-backed forms (for a review, see, e.g., Bertoni, Colombo, 2005), though even among the VC-backed firms only few will prove to be successes and perform better than their competitors.

3. Value-adding functions of VC

The above account refers to the basic role of VC as a financial intermediary. Nevertheless, this function is not the only, and probably often not the most valuable contribution of VC to the investee companies. The VCs have a stake in the equity of their investee companies and therefore, an important incentive to improve the likelihood of reaping high economic returns and to promote the economic performance of the firms.

VC can add value to an investee company indirectly before the investment decision, because in order to fulfil investment criteria and obtain financing, a company may need to develop its operations, business plan or resources. These changes can, irrespective of whether the firm obtains funding, influence positively the firm's possibilities for growth and survival.

According to the financial literature, VC performs a valuable "scouting" function in that it is able to identify and provide early stage financing to young high-tech companies

characterized by great “hidden value” (Bertoni, Colombo, 2005). The screening process of potential investment targets is very thorough and usually demands a lot of time from the VC. Through this function, companies receive information of the ways in which the investor thinks they need to develop their strategies and ‘routines’ to become an investment target. This learning process applies even to the firms that finally obtain a negative investment decision. In fact, a very small percentage of investment candidates will obtain a positive investment decision (1–5%, according to Berlin, 1998, based on Bertoni, Colombo, 2005) emphasizing the highly selective nature of the process.

Further, once an investment decision has been made, VC provides management support to the company in areas in which technology-based firms typically lack the necessary competencies, e.g. strategic management, financial, administrative, and marketing competencies. When dealing with outside service-providers or acquiring customers, investee companies can also benefit from the VC’s network of business contacts. The value-adding services can vary by nature and the venture capitalist can act in many strategic supportive roles, e.g., as a “sounding board”, “business consultant”, coach/mentor, or management recruiter (Timmons, Sapienza, 1992). According to some studies, the development stage of the company matters for the relative importance of different strategic roles of a venture capitalist. Thus, for example, the roles of financier, management recruiter and provider of contacts were found to be more important for early-stage companies as compared with more mature companies (Timmons, Sapienza, 1992, 39).

VCS monitor the activities of invested firms closely and provide further rounds of investment if the firms achieve the milestones set for them formally or informally. Venture capitalists can use mechanisms of corporate governance for monitoring their portfolio firms: i.a., through contractual arrangements, financial reporting systems, and having representative(s) on the board of directors (Nathusius, 2002). A seat on the Board of Directors is regarded as a major method of providing advice to the portfolio company and ensuring that its managers fulfil their obligations and follow the advice. Adopting proper systems of corporate governance makes the new firm more transparent to other stakeholders, and can enhance its ability to attract financing from new investors.

Additionally, VC support to a company gives a signal of firm’s quality to its stakeholders, e.g., other financiers, when recruiting key personnel and employees in general, customers, suppliers, and other business contacts (Bertoni, Colombo, 2005). For example, VC can help the investee firms to acquire further funding by forming investor syndicates with other investors, and through their own reputation, provide a signal of the potential value of the

investee company. The signaling effect is regarded as important especially in the context of exits, for example, through initial public offerings.

Several surveys carried out in the 1990s have emphasized a few dimensions which have proved to be important roles of venture capitalist, namely, arranging financing, strategic planning, serving as a sounding board, providing contacts, and monitoring performance (for a review of these studies, see e.g., Bertoni, Colombo, 2005; Maunula, 2006). Some of the studies (e.g., Harrison, Mason, 1992) draw attention to the fact that informal investors are involved in a larger number of activities than (private sector) venture capitalists. Furthermore, the findings suggest that entrepreneurs and VCs assess the usefulness/importance/effectiveness of the roles of the venture capitalist differently, and that entrepreneurs value the areas of VC involvement in another way depending on, e.g., the type of firm.

Overall, there is a great number of studies on the different roles venture capitalist can have for a portfolio company, and on the factors affecting the perceived value-added. The latter enlist 1) factors related to the portfolio firm (such as stage of venture, innovation pursued, competitive strategy, uncertainty in the environment), 2) factors related to the relationship between VC and CEO (e.g., frequency and openness of interaction), and 3) factors related to the VC (experience in VC activity and in the industry of the portfolio firm) (Sapienza, 1992; Sapienza et al., 1996). There are also studies on the relationship between the level of VC involvement and economic performance of the portfolio firm. According to Fredriksen et al (1992), active VC influence is reflected in non-economic development (such as motivation of the management), and to a much lesser degree, in economic development of the investee firm; Barney et al. (1996) found that the performance of the investee firms is not related to VC involvement as assessed by the management, and thirdly, MacMillan et al. (1988) did not find statistically significant differences between the economic performance of investee firms supported by active vs. non-active VCs. Thus the overall picture is not clear with regard to the nature and degree of benefit for the economic performance of ventures by VC involvement.

To summarize, VC is thus in principle an important mechanism to support startups to experiment and develop their ideas into viable businesses, though empirical studies have provided either non-comparable, or sometimes, conflicting findings of the actual outcomes of VC involvement. The principal ways in which the VC influences the firm is, first, a 'scouting' function, that is, identifying potentially promising firms for further development and survival. Secondly, VC provides money for the chosen firms for the experimentation and development of technology-based inventions into marketable innovations. Thirdly, the VC provides the

investee firm with much-needed business skills which enable the development of business activities and experimentation in the area of new technology. Fourthly, the VC monitors the investee firms closely and defines optimal corporate governance, and fifthly, signals the portfolio firm's value to other investors and stakeholders. In this paper, we pay attention to all the non-monetary dimensions which increase the potential for high-tech start-up firms to grow.

4. VC and biotech

As pointed out above, Venture Capital and related financial institutions emerged as a response to the requirements of the ICT Revolution. The development of Venture Capital as an industry³ in different countries, such as Finland, was related to the rapid expansion of the ICT technology and its growth expectations (according to Perez, 2002, the so-called frenzy period).

It is pertinent to question whether and the degree to which Venture Capital and related financial institutions are appropriate means of financing trial and error/experimentation in the Life Sciences and particularly biotechnology area, where the product development process is much longer and more uncertain than in the ICT, and thus the financial expectations of VC cannot be fulfilled to the degree they might in the ICT. In the ICT, innovation is driven by collaboration with customers in downstream product markets (endogenous-driven growth) and the time required for a product to enter the market is short when compared with a science-driven area such as biotechnology (exogenous-driven growth) (Fagerberg, 1994; Palmberg, 2004).

The various application segments of biotechnology vary a great deal, and especially in human health-related drug development, the product approval process is very stringent and has to fulfil the requirements concerning the phases of pre-clinical and clinical testing. Most of the candidate drugs will be eliminated from further development during this process. The capital requirements of this process are huge (the development of a successful drug was estimated to range between 500-800 million EUR a few years ago), and only very large companies can expect to have sufficient resources to take this process till the end. Small biotechnology firms can, nevertheless, expect to conduct profitable business through the development of candidate drugs the Intellectual Property Rights of which they license out at a

³ Avnimelech and Teubal, 2005.

suitable stage (see, e.g., Luukkonen, 2005). In the various business segments, including drug discovery, small biotech companies can expect to gain revenues during the product development phase by providing services, such as diagnostic or R&D services. These do not, however, accrue enough resources for the resource-intensive R&D processes concerning their inventions. Furthermore, in biotechnology, companies cannot benefit from network externalities as they do in the ICT.⁴

The risks associated with investing in biotechnology are very high taking into account that firms are dealing with a technology that is still at a very early stage in its development and wider application⁵. This has led to public policy initiatives to finance the commercialisation of technology in biotechnology to a greater extent than, e.g., in the ICT. For example, in Finland, Sitra, a public fund under the Finnish Parliament, has been a major seed-stage investor in the area of biotechnology (Luukkonen, 2005; Luukkonen, Palmberg, 2005; Luukkonen, 2006). It has, however, declared its willingness to exit from its biotech portfolio, because it has not enough money for follow-on investments which the portfolio firms need, but so far, has not managed to do so except in a couple of cases. The fact that Sitra has not made any new investments has had its impact on the number of new firms in biotechnology established annually, which plummeted to practically zero in 2005 (Luukkonen, 2006).

5. The research question

The importance of governmental investors in the biotechnology area highlights the question about institutional variety of VC organisations and the ‘fitness’ of different organisation types to fulfil the functions VC. As said, independent limited partnerships became the dominant design in VC industry in the USA and Israel. A slight adaptation of this institutional type also emerged in Finland, but additionally, Sitra and a couple of other state-owned (hence public sector VC) organisations (Finnish Industry Investment Ltd and Veraventure Ltd, Luukkonen, 2006) have an important role in venture funding, in addition to informal investors (business

⁴ Innovation and performance of firms essentially depend on how they manage to integrate their products with existing and future infrastructures and equipment (Koski and Sierimo, 2003). Innovation is thus highly systemic by nature and new markets are often created by firms themselves through standardisation of technologies and critical interfaces between them.

⁵ According to Perez (2002), we may even question whether there has been a ‘big bang’ of a new technological revolution in biotechnology.

angels). While financial literature on VC regards the limited partnership type of funds as standard, and the best ‘fit’ (e.g., Gompers, Lerner, 2004), we can raise the question of the extent to which other types of institutional variety, especially the public sector VC organisations have the required competencies or policies to act as hands-on investors as contrasted with being passive investors. Furthermore, the incentives of public sector VCs to provide for the expected value-adding services can be questioned. The reference to ‘incentives’ here implies the fact that in public organisations, the employees do not have their own money at stake, and do not suffer or gain from bad or good performance of the portfolio companies of the organisation. We do not pay attention to corporate VCs because there is little corporate VC activity in biotechnology in Finland.

Research on the performance of public sector VC organisations is not abundant. For example, Gompers and Lerner (2004) raised this issue and referred to a study of the SBIR programme, which, however, is an award programme, not a venture capital investment programme as such. Authors, such as Eliasson and Eliasson (1996), have presumed that “government washes competencies away” from VC investments, thus do not provide competent value-adding services. Furthermore, Seppä (2000, 154) argues that “entrepreneurs could be better off with a more demanding and more ambitious private sector venture capitalist than with governmental VCs who can be practically seen to give money away.” The mission of governmental venture capitalist is seen to rectify capital market failures (Hyytinen, Väänänen, 2003, 351; Seppä, 2000, 150). In their empirical study, Schilder (2006) and Schäfer and Schilder (2006) have recently paid attention to potential differences in their consulting activities between the public and private sector VC companies in Germany. They found that public sector VCs have on average a much larger number of investee companies per manager, which limits their potential for active hands-on activities. Consequently, public sector VCs have fewer face-to-face and telecommunication contacts with their investee firms, and are much less active in a range of consulting activities vis-à-vis the firm as compared with private VCs or business angels (Schilder, 2006; Schäfer and Schilder, 2006).

The role of informal investors (such as business angels) is also seen to differ from that of private sector (standard model of) VC investors, namely, they play a more active and hands-on role in the investee firms (Harrison, Mason, 1992; Schäfer and Schilder, 2006), and at the same time, they are involved in fairly similar sets of activities as private sector VCs, though the latter are more inclined to establish formal reporting and operating controls and to help on staffing and financial management (Ehrlich et al., 1994).

This study will concentrate on the VC value-added to young and small and medium-sized biotechnology firms in Finland. The study problem relates to measuring the extent and nature of providing value-added to the portfolio companies by different types of VC. The empirical data draws on the assessments of the portfolio companies, which of course is only one side of the matter. This study does not aim to measure success in VC function in terms of economic performance of the portfolio firm because firms in biotechnology are to a large extent still in the development phase, and even though might have some products in the market, overall are to a large extent unprofitable.

Our major assumption is that public sector VCs are not as active (with hands-on approach) as other VCs in provision of value-added services. Nevertheless, their role in other respects is open and we cannot formulate any specific study hypotheses on the matter. We will control for firm age and its development stage (as measured by innovations already brought to the market) as far as possible, though for the small size of subgroups in the analysis, can only do so for findings at the level of total population. The study cannot address the issue of the role of foreign VCs as compared with Finnish ones, since it is based on interview data aiming to measure the value-added of the lead investor, and foreign investors were very few (only two) in this data to allow for a proper analysis.

6. Data and methods

The study is a combination of a survey and interviews, conducted towards the end of 2005, with the total population of small and medium-sized, specialised biotech companies, established in Finland since 1985. Information of the population of small and medium-sized biotechnology companies was obtained through an accumulation of several databases and earlier survey data collected by The Research Institute of the Finnish Economy and its daughter company, Etlatietao Ltd. This earlier data was complemented by checking through public registrars, firms' webpages, and telephone calls to technology/bio centres where many of the firms were situated to enquire whether the firms were still active or whether new firms had been founded by the time of the survey and interviews, the end of 2005.

The total study population of active small and medium-sized biotech firms was 85, of which 81 were interviewed or replied to a survey⁶. Thirty-six firms had never had VC

⁶ For the high response rate and the nature of the study as one reaching the total population, we do not conduct statistical tests to the study results.

funding (non-VC-backed firms), while 4 firms had had VC funding, but the VCs had exited; 3 were publicly held companies where VCs were shareholders, and 38 currently had a VC. This group of 38 firms will form the study population for the study of value-added of VCs, since only the privately-held firms that currently have VC funding were analysed in this respect. The firms that had a VC were interviewed, and non-VC-backed firms filled in a questionnaire. The study also draws on material on Finland collected for the PRIME Venture Fun project (Luukkonen, 2005).

In most firms, the respondent was the CEO of the company⁷. When studying the value-added of the investors, each CEO was asked to assess the activities of the lead investor in the potential syndicate. Nearly half of the firms had more than one investor (see Appendix table).

7. Findings

7.1. Features of the study data

As we might assume, there were more young firms among the VC-backed than non-VC-backed firms, though the differences were not large. In a similar vein, the VC-backed group had more firms that were in an early stage (as measured by not having a product or service on the market). These were on average somewhat larger (in terms of the number of employees), had a much larger share of their total operating costs in R&D, and had more firms involved in drug discovery, which could be expected for their long product development phase, and fewer firms involved in diagnostics or services. Even though a large number of firms were involved in services in addition to other business segments, their proportion was larger among the group of firms that were not backed by VC. This indicates that these firms had discovered services as one of the means to generate turnover. The larger staff numbers and higher percentage of the costs devoted to R&D by the VC-backed firms could be interpreted as an indication of the direct financial value-added by the VCs thus providing the investee firms with more resources to develop their products and other activities.

⁷ In three companies the CEO had recently changed, and the ex-CEO was interviewed. In a few cases, the interviewee was other manager or founder. However, in all companies, the person with the longest experience of co-operation with their venture capitalists was interviewed.

Table 1. Description of the firms in the total study population

	VC-Backed (N= 45)*		Non-VC-Backed (N=36)	
Company Age				
1-5	20	44 %	14	39 %
6-10	15	33 %	12	33 %
11-15	6	13 %	8	22 %
15-20	4	9 %	2	6 %
Stage				
Early stage**	13	29	6	17
Later stage***	32	71	30	83
Number of Employees				
Less than 10	19	42 %	27	75 %
10-49	21	47 %	7	19 %
50-250	5	11 %	2	6 %
R&D costs as per cent of total operating costs				
Less than 50%	17	38 %	18	50 %
50% or more	22	49 %	3	8 %
No information	6	13 %	15	42 %
Industry application segments (not exclusive categories)				
Drug Discovery	21	47 %	10	28 %
Diagnostics	12	27 %	19	53 %
Biomaterials	12	27 %	6	17 %
Services	31	69 %	35	97 %

*Firms that have had VC at some stage, including those where the VCs had exited and that had gone public

**Early stage= no products or services in the market

***Later stage= at least one product or service in the market

Forty-four per cent of the non-VC backed firms had tried to obtain VC funding, but had not succeeded. About half of the non VC-backed firms had plans to seek VC funding within the next 3-5 years, and the majority of them were prepared to develop their activities in order to fulfil the investment criteria of VCs.

Table 2. Characteristics of the CEOs of firms in the total study population (N=81).

	VC-backed (N=45)		Non-VC-backed (N=36)	
CEO Characteristics				
Research background	23	51 %	24	67 %
Years of Industry Experience				
1-5	11	29 %	4	11 %
6-10	7	16 %	5	14 %
More than 10	27	55 %	14	39 %
Missing	0	0 %	13	36 %
Years of Management Experience				
1-5	13	29 %	7	19 %
6-10	12	27 %	14	39 %
More than 10	20	44 %	13	36 %
Missing	0	0 %	2	6 %

The non-VC-backed firms had a CEO with research background more often than VC-backed firms; nevertheless, their CEOs had longer experience of the industry and about the same amount of management experience. We cannot attribute any of these differences to influence or selection by the VC, since we neither know these attributes before the VC involvement nor whether the VC had required any change in this respect.

Table 3. Age and stage of the investee firm by type of VC

	Informal VC	Public sector VC	Private sector VC
N	11	14	13
Young firms (1-5 yrs)	64 %	43 %	31 %
Early-stage firms	27 %	29 %	38 %

The firms with VCs differed somewhat by type of VC. Firms with informal VCs were more often young, while firms with a private sector VC were more often in an early-stage. These characteristics may be reflected in the findings later on, but for small size of subgroups, we cannot control for the influence of firm age or stage further than in the total population, at the level of VC type.

7. 2. Non-monetary value-added

7.2.1. Overall assessment of the utility of value-added serviced by type of VC organisation

Whether measured by perceived value-added or fulfilment of expectations, informal VCs ranked best among the three VC types studied. Ninety per cent of the companies with informal VC as the lead (or only) investor assessed the overall non-financial support (overall value-added) of the investor as fairly or very important for the success of the company, while the share was just a little above 40% for the public sector VCs and over 60% for the private sector VCs (Figure 1). When the fulfilment of expectations was enquired, in a similar vein, ninety-one percent of firms with informal VCs as the lead answered positively while percentages for other firms were around 50. It is to be noted that these two variables had some co-variation, though the answers were far from identical and the respondents had thus assessed them separately.

Percentage of responses

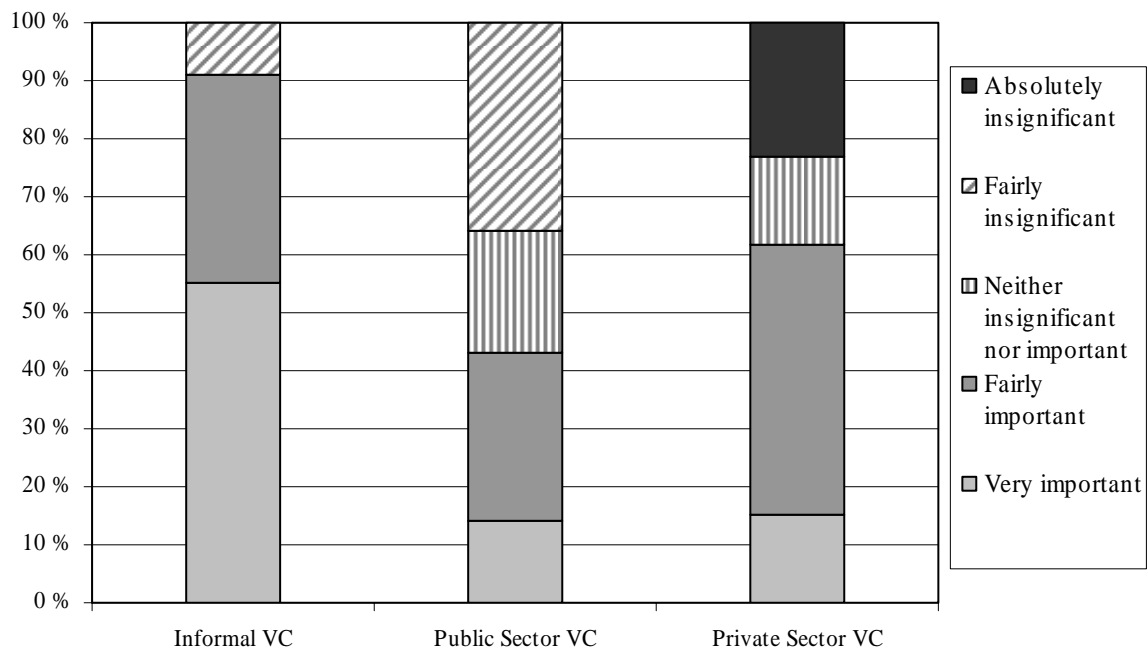


Figure 1. Perceived value-added of VC by VC type.

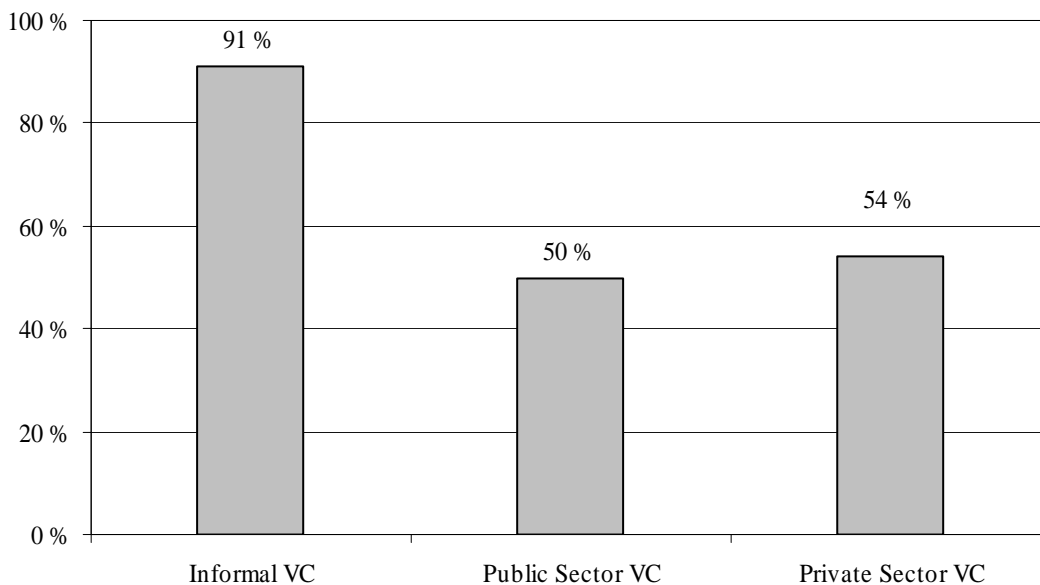


Figure 2. Fulfilment of expectations

Young firms (under 6 years old) and those in early stage (did not have a product or service on the market) tended to find VC support fairly or very important and their expectations were fulfilled more often than those of other firms (Table 4). The differences were not great, especially when firms assessed the overall importance of VC support by stage

of investee firm. In earlier studies venture stage has been noted to be related to higher value-added by VCs, though the findings have not always been statistically significant (e.g. Sapienza, 1992; Sapienza et al., 1996; Timmons, Sapienza 1992).

Table 4. Fulfilment of expectations and perception of the value-added by investee company age and stage.

	Age of the investee company		Stage of the investee company	
	1-5 years	More than 5 years	Early stage	Later stage
N	17	21	12	26
VC involvement has fulfilled expectations	76 %	52 %	75 %	58 %
VC's non-financial support has been fairly or very important for the company's success	71 %	57 %	67 %	62 %

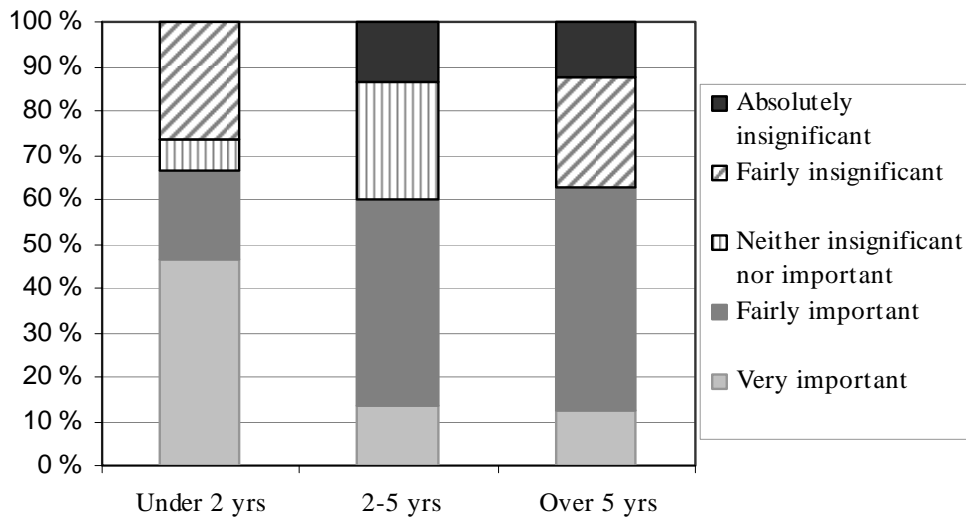


Figure 3. Firm age at the time of lead investor entry and perceived value-added

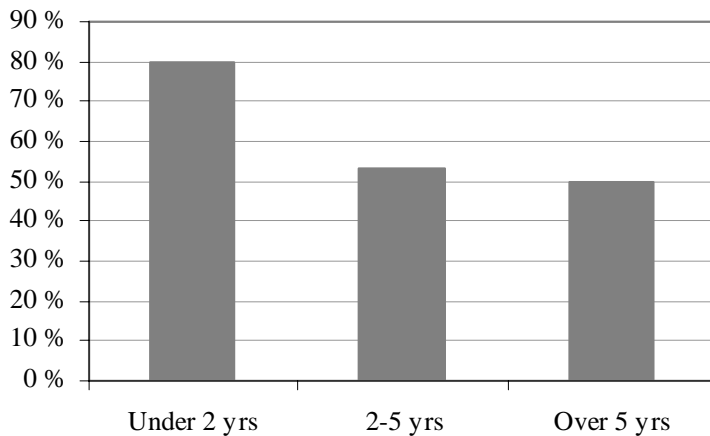


Figure 4. Firm age at the time of lead investor entry and fulfilment of expectations

When we consider the age of firm at the time of lead investor entry (Figures 3 and 4), the findings are more pronounced; the youngest age group evidenced highest perceived value-added and higher fulfilment of expectations than other firms. The latter two groups were fairly similar in both respects.

We may assume that firm age at the time of VC entry can, at least to some extent, be related to the greatest value-added and fulfilment of expectations of informal VCs, since firms with informal VCs were youngest at the time of lead investor entry (Table 5). This conclusion can be drawn presuming that newly founded firms are in great demand for value-adding services of VC, but the assumption needs further exploration. The age differences of firms of the different groups were still noticeable at the time of the study even though the lead investors had entered in different years (median year of entry for informal VCs was 2003, for public sector VCs 2001, and private sector VCs 2003).

Table 5. Age of firm at the time the lead investor entered

	Informal VC	Public sector VC	Private sector VC	Total
N	11	14	13	38
Age of firm when the lead investor made its first investment				
Average	1,5	3,1	5,9	3,6
Median	1,0	2,0	5,0	2,0
Age of firm at the time of the study				
Average	5,8	7,9	8,4	7,5
Median	4,0	8,0	8,0	7,5

7.2.2. Implementation of pre-investment development activities; differences by VC type

As indicated above, we include pre-investment development activities as part of the scouting function. In total, 68% of the VC-backed firms said that they had improved their activities before the investment in order to fulfil the investment criteria of VCs and to be more attractive as investment targets (Table 6). Those with a private sector VC had done so more often than other firms.

Table 6. Implementation of pre-investment development activities in biotechnology companies in order to make the company more attractive for VCs. Distribution of responses by VC type.

	Informal VC	Public Sector VC	Private Sector VC	Total
N	11	14	13	38
No	36 %	36 %	23 %	32 %
Yes	64 %	64 %	<u>77 %</u>	68 %

Among pre-investment development activities, development of business plan and strategies was mentioned most often, irrespective of the type of lead investor (Table 7). Differences by type of investor were not great, but there were some nuances such as firms with a public sector VC paying more attention than other firms to changes in the management team and ownership arrangements.

Table 7. Pre-investment development activities implemented by companies in order to make the company more attractive for different types of VCs

	Informal VC	Public Sector VC	Private Sector VC	Total
N	11	14	13	38
Number of firms that had taken some development measures	7	9	10	26
Development measures mentioned				
Development of the business plan or business strategies	6	7	7	20
Development of the R&D function	4	4	3	11
Development of patenting	3	4	2	9
Development of the marketing function	2	3	3	8
Changes in the composition of the management team	1	4	2	7
Increase the share of ownership of the management team or employees	2	3	2	7
Other rearrangements in the ownership structure (for example having outside private person as a partner)	2	4	1	7
Changes in the composition of the board of directors	1	2	2	5
Development of the production function	2	1	0	3

7.2.3. Areas of value-added services; differences by VC type

In the following, we will show a series of spider net figures which illustrate the activity areas in which VCs had been most active after the investment decision. The first, Figure 5, shows the areas in which the VC had served as a sounding board to the management team and thus had in fact been actively involved; the second, Figure 6, the areas which were mentioned

being among the three most useful activities by the VC indicating an assessment of the involvement of the VC, and the third, Figure 7, areas in which VC involvement would have been most useful (being among the three potentially most useful activities) indicating unfulfilled expectations towards the VC by the CEO.

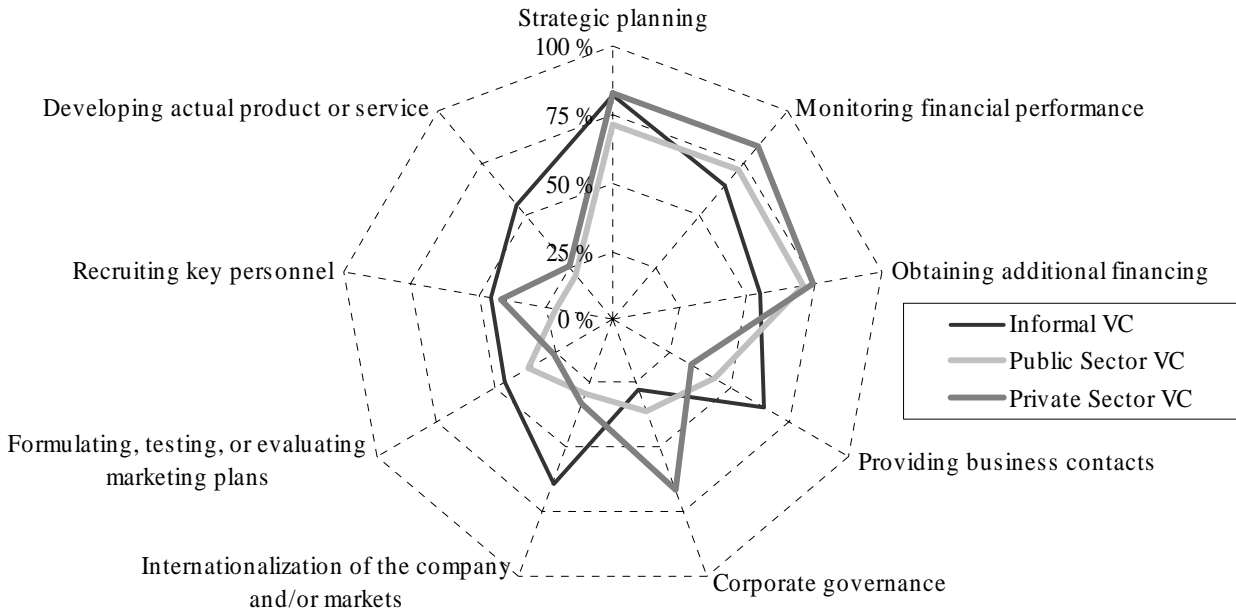


Figure 5. Areas of activity, where the lead investor serves as a sounding board to management team. Percentages are based on the number of companies in each VC category that responded that their lead was serving as a sounding board in one or more area of business.

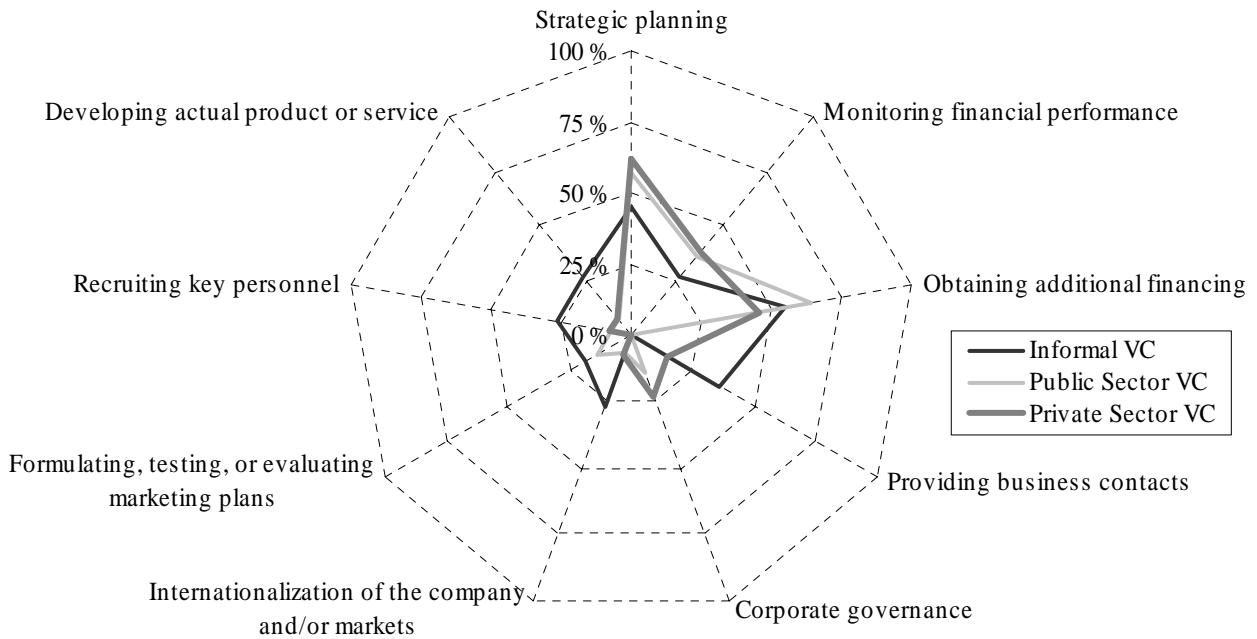


Figure 6. Areas in which the involvement of the VCs has proved most useful. Percentage of the CEOs (N=38) evaluating that VC involvement in each activity area has been among the three most useful areas.

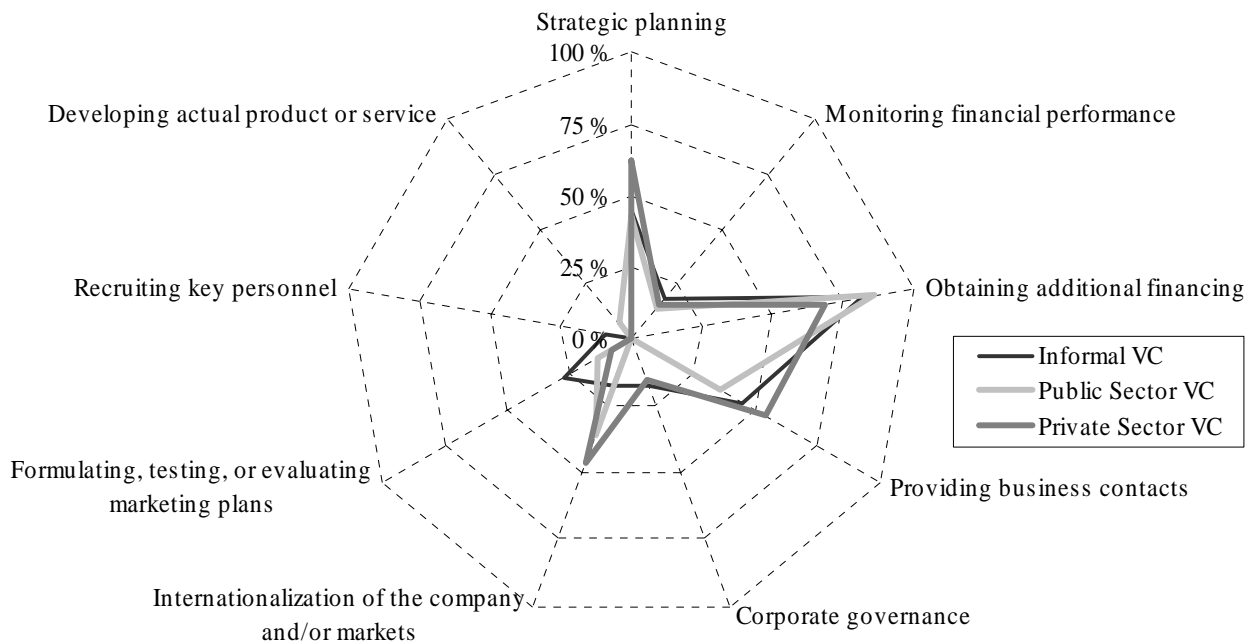


Figure 7. Areas in which the involvement of the VCs would be most useful. Percentage of the CEOs (N=38) evaluating that VC involvement in each activity area would be among the three most useful areas.

The overall areas of value-added where Finnish investors in biotechnology were active are by and large similar to areas noted in earlier studies in other countries (cf. the review by Bertoni, Comombo, 2005; Erlich et al., 1994; Harrison, Mason, 1992; MacMillan et al., 1988). VCs acted as a sounding board fairly often and in many areas. All VC types were most active in the area of strategic planning (Figure 5). Public and private sector VCs were more active than informal VCs in monitoring financial performance, corporate governance, and obtaining additional finance, while the latter was more active in all the other areas. It is notable that informal VCs were most active in providing business contacts and furthering internationalisation of the company and/or its markets, activities where we might expect professional private sector VCs to be more active or more capable.

VCs are not typically responsible for the implementation of matters. Thus they were responsible for the implementation (more than the management team) only in fewer than half of the firms (17/38), and if this happened, the area most often concerned obtaining additional financing (60% of those responding positively, 26% of all respondents).

Strategic planning and obtaining additional financing were the areas in which all VC types were rated as most useful, though the percentages varied within range of 45–70%. These same areas are also the ones in which the CEOs considered VC involvement would have been most useful. Additionally, CEOs hoped more VC involvement in providing

business contacts, and aside from informal VCs, more involvement in the internationalisation of the company and/or its markets.

There were fewer differences between the areas in which CEOs would have wished more VC involvement by VC type than when we compare actual VC involvement and its usefulness. This probably reflects both the concerns of investee firm management and insufficient value-adding services provided by the investors.

The differences between the three figures probably reflect the fact that CEOs did not wish more VC involvement in monitoring financial performance or corporate governance and, therefore, did not rate these activity areas among those that were most useful, even though VCs generally were active in them. We can question whether this is an indication of insufficient understanding of the role of the VC by investee firm management, given that in a small, privately-held growth-oriented company, adopting proper systems for corporate governance reduces information asymmetries and thus makes the company more transparent not only to its current stakeholders, but also to the wider financial community (Bertoni, Colombo 2005). If the company aims to become publicly listed, the management team has to learn and apply normal corporate governance procedures which are in that case a statutory requirement (Nathusius 2002, 11).

7.2.4. *Monitoring*

The value-adding function of the venture capitalists is usually vested in the active role of the VC in the investee firm's board of directors (e.g., Gompers, Lerner, 2004, 166). The following Table 8 and Figure 8 report on the structure of the investees' boards and VC involvement.

Table 8. Number of seats the lead investors or their representatives hold in the investee's board of directors.

	Informal VC	Public Sector VC	Private Sector VC	Total
N	11	14	13	38
0	18 %		8 %	8 %
1	55 %	93 %	77 %	76 %
2	9 %	7 %	15 %	11 %
3	18 %			5 %
Total	100 %	100 %	100 %	100 %

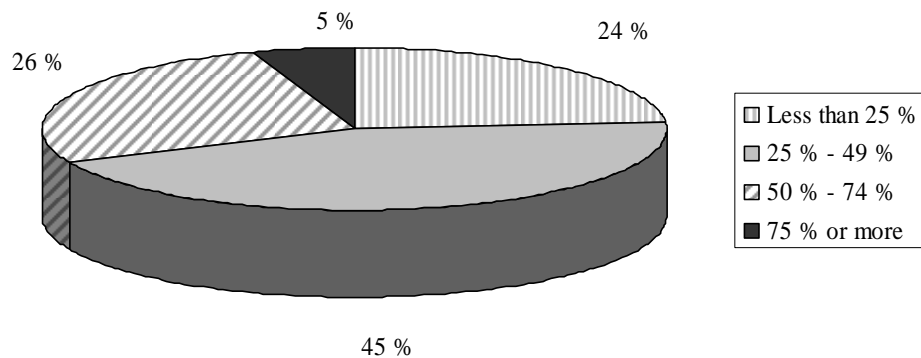


Figure 8. The share of all venture capitalists and their representatives in the board of directors of VC-backed Finnish biotechnology companies (N=38).

As seen in Table 8, public sector VCs always had a seat on the board of directors while one firm with a private sector VC and two firms with an informal investor did not have VCs or their representatives on their boards. All VCs and their representatives were found to hold, on average, 1.6 seats in the boards of directors. This number is rather small compared to the results of the study of Sapienza et al. (1996, 451), in which the outside investors had, on average, 2.7 seats in the boards of the investee companies.

In the majority of firms (69 %), VCs held a minority of the seats on the board. In one company the board consisted only of representatives of VCs, whereas three boards did not have any VCs or their representatives. There are seemingly different practices in different countries in this respect, since according to Sapienza et al. (1996, 451), outside investors usually held a majority of all seats of the investee's board in France, in the Netherlands and in the USA, while the UK-based VCs held usually a minority of the board seats.

Table 9. Frequency of board meetings and all direct and indirect contacts with the investee company by VC type.

	Informal VC	Public Sector VC	Private Sector VC	Total
Frequency of Board Meetings	N=7	N=14	N=12	N=33*
At least once a month	29 %	50 %	42 %	42 %
All contacts	N=11	N=14	N=13	N=38
1-5 times in a week	73 %	36 %	46 %	50 %

*Missing five responses: three companies in which the lead was not a member of the board of directors, and one company in which the lead VC was the only member of the board of directors. One company did not respond to this question.

Forty-two percent of the companies with VCs as board members held a meeting at least once a month, with some variation by VC type. Firms with informal lead investors held their board meetings less often than those with a public sector or private sector VC. In total, management teams and VCs meet fairly often. All contacts in Table 9 include the board meetings. In total, half of the respondents reported that they met their lead investor at least once a week, and the means aside from board meetings, included telephone, video-conferences, and email. This means that contacts other than face-to-face can provide important possibilities for VCs to monitor their portfolio firms, though whether these other types of contact reduce the quality of value-adding services is not known. The findings by Fritsch and Schilder (2006) in Germany that VCs and business angels have frequent contacts with their investee firms through telephone and internet supports the conclusion that tele- and other communication means offer a complement to face-to-face contacts. We can question whether various communication means have, at least to some extent, reduced the importance of geographical closeness for the monitoring of the portfolio firm by the VC (see, e.g., Powell, Koput, 2002).

The more frequent contacts with informal investors are reflected in their relationship with the investee firm which is closer than the relationships among other investor types and the investee firm. In this study, the respondent CEOs were asked to rate the closeness of their relationship with the lead investor. The respondents with an informal VC as the lead in 91% of the cases rates the relationship as fairly or very close while the percentage was 79% for those with a public sector VC and 54% for those with a private sector VC. Conversely, only 9% of the firms with an informal lead investor reported tensions inside the company caused by active involvement of the lead investor, while the figure was 64% for firms with a public sector and 54% for a private sector lead investor.

Another way to control the investee firm is to include clauses in the investment contracts that guarantee special rights to the VC. Two CEOs did not know whether the contracts of their lead investor included any veto rights and two CEOs did not have any formal agreements with their lead investor. In case the veto rights were mentioned in the contract, these covered a variety of areas⁸. Figure 9 provides the percentages of companies where VCs have veto rights in their investment contracts, by type of investor.

⁸ The veto rights included changes in the financial structure of the company (7 cases), appointing and/or suspending key personnel (7), selling the company or other clauses of exit (6), important strategic decisions (6), important contracts (5) and obtaining additional finance (5). Other areas mentioned included the use of available cash, an option to claim a seat on the board and approval of certificate of incorporation.

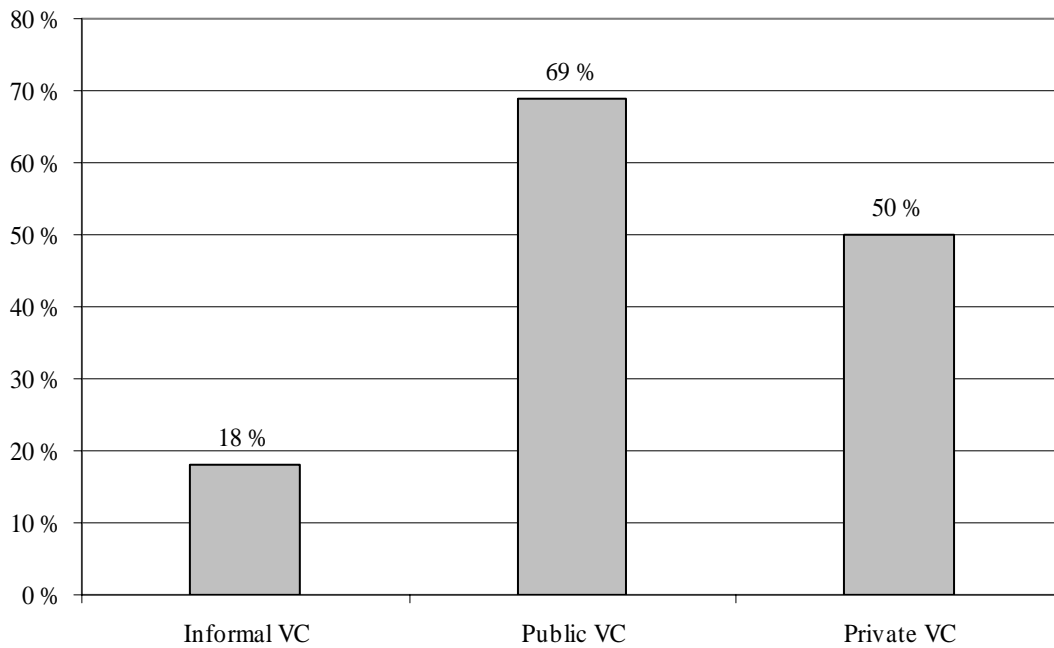


Figure 9. Investment contracts including veto rights for VC by VC type.

Percentage of responses per investor type

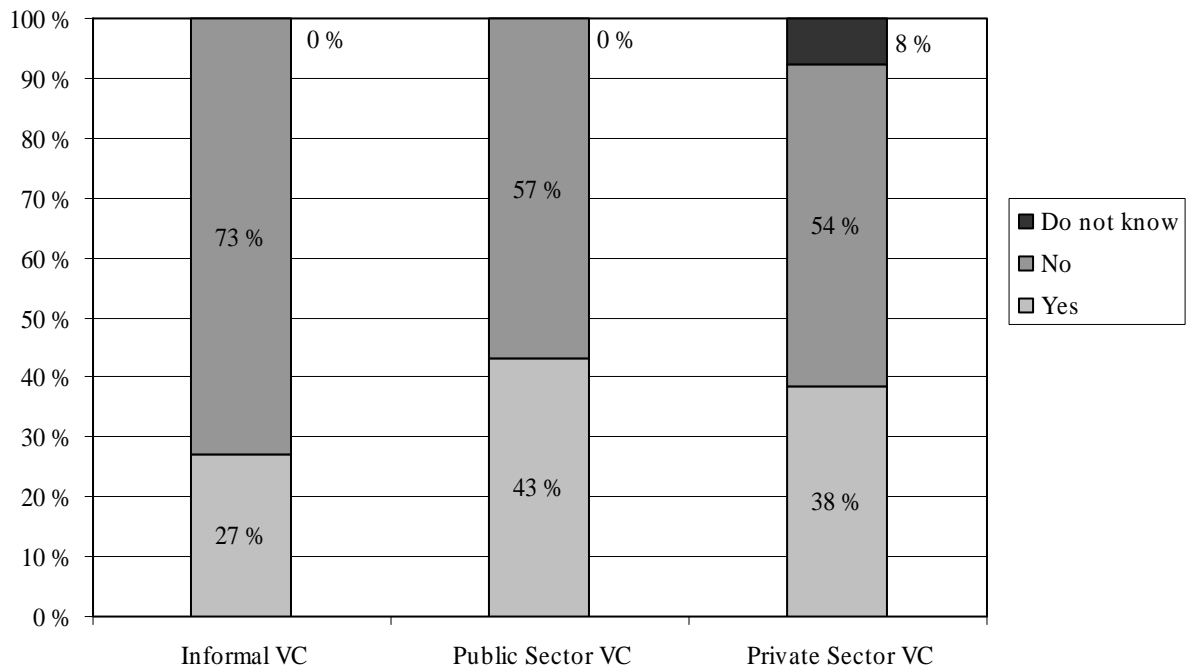


Figure 10. Agreements made upon a follow-on investment with the lead investor by VC type.

The companies with a public sector VCs lead investor most often had such veto rights in their contracts, while by contrast, those with informal investors as lead seldom had them. Investment staging provides yet another mechanism of monitoring and guiding the portfolio company. This matter was explored through a question on agreements on follow-on investment with the lead investor (Figure 10). Overall, only 37% of the firms had such agreements. Differences by type of investor were not large, and again, informal investors least often had made them.

The milestones that were a prerequisite for follow-on investments most often concerned specific research and development objectives. Bringing product or service to the market and generating enough cash flow were also mentioned.

7.2.5. *Signalling*

In order to study the signalling effect of VC, companies were asked whether they had mentioned the VC's name when trying to acquire resources. Overall 66% of the companies had done so. Figure 11 gives these percentages by investor type. Differences are rather outstanding. With the exception of one case, the firms with a public sector VC as lead investor had mentioned the lead's name when trying to acquire resources, while the share was only 36 % for those with an informal VC and 69% for those with a private sector VC. That the firms had used the name of their VC to support their case, in our understanding, reflects the presumed status of each investor. Thus informal investors probably are less well-known and could less well convince other potential investors or other stakeholder groups of the value of the investee firm.

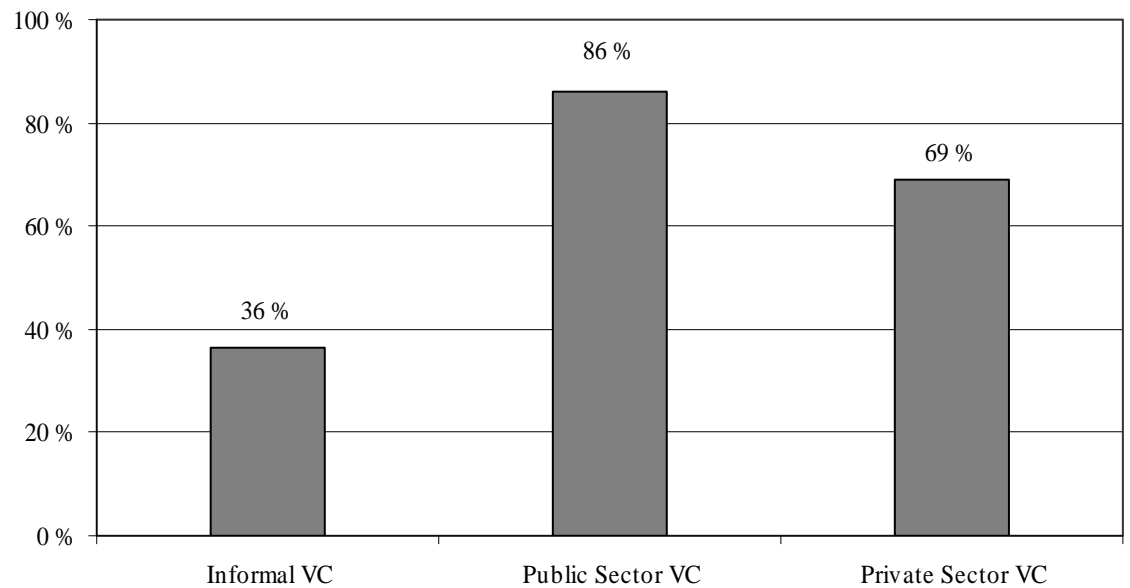


Figure 11. Mentioning the name of VC in order to improve company image when acquiring resources.

When using the VC's name to support their case, firms in all respondent groups had used it most often when trying to obtain financing from other investors. However, this was more frequent among firms with a public sector VC, as 86% of these firms had mentioned the VC's name in this connection, while the percentage was 36% for the firms with an informal investor and 62% for firms with a private sector VC as lead investor. According to a comment, the signaling effect of the public sector VC was, e.g., useful when acquiring money from foreign investors and in Finland when recruiting employees, since it had "a reputation of not letting its portfolio firms go bankrupt". This comment can be regarded as an unusual signalling effect, because it does not signal the quality of the investee firm, as is expected, but the fact that the public VC acts as a guarantor of risk. Earlier research findings suggest that VC may help in attracting, besides investors, customers, partners and employees (cf. Bertoni, Colombo 2005; Maula 2001, 123; Nathusius 2002, 104; Timmons, Sapienza 1992). These other matters were less often mentioned in this data (Table 10).

Table 10. Resources that firm management has tried to acquire using the name of VC.

	Informal VC	Public Sector VC	Private Sector VC	Total
N	4	12	9	25
Acquiring financing from other investors	4	11	8	23
Acquiring new customers	2	3	1	6
Acquiring new suppliers or cooperation partners	2	2	1	5
Recruiting new employees	1	1	0	2

8. Discussion and conclusions

The findings of this study indicated that according to the assessments of the CEOs, VCs added value to Finnish biotechnology companies besides directly through monitoring and providing non-financial support, indirectly through screening investments candidates and through signalling. The value-adding of the VCs was not merely vested in the VC's role on the boards, as commonly argued in research literature, but the lead investors were in frequent contact with their investee firms outside the board meetings and using modern means of communication (telephone, email, video conferences etc). Although this could suggest that geographical proximity between VC and company may not be as important for the monitoring function as is presumed, it could affect the quality and nature of the value-adding process. Furthermore, the fairly small proportion of face-to-face contacts in a relationship may also result from shortage of time by the VC.

The findings of our study suggest that informal VCs, that is, business angels provided the highest value-added as judged by the CEOs of investee firms. In our data, the portfolio firms of informal VCs were by far youngest when they had become lead investors as compared with public sector or private sector VCs, and these firms were still younger than other firms in our data. This fact could to some extent explain the finding of the highest value-added presuming that younger firms are in greater need of VC support. Other potential reasons for the highest value-added of informal VCs might be related to the fact that business angels were in most frequent contact with their investee firms and maintained closest relationships with them providing mental support to the management team of the investee firms.

Informal VCs acted as the least professional in terms of promoting corporate governance or regulating the relations with the firm through formal contracts (cf. Ehrlich et al., 1994). However, these are areas which the management teams of portfolio firms (probably) do not necessarily perceive as important as seen in their assessment of the actual and potential usefulness of the VC involvement. The perceived success of informal VCs was clearly related to the existence of trust – indicated by absence of conflicts and the frequency of contacts – among informal investors and the management team. The advice informal investors supplied would thus be best received by the management team.

Overall, the three different lead investor types, informal VCs, public sector VCs, and private sector VCs had different profiles in providing value-added. In addition to maintaining closest and most frequent contact with the firm, informal VCs supported especially strategic

planning in the firm (supporting the findings of Harrison and Mason, 1992). In providing value-adding services they were more active than other VC types in providing business contacts and internationalisation of the company or its markets. Private sector VCs emphasised corporate governance, strategic planning and monitoring financial performance, while the public sector VCs had the highest signalling effect as the VC's name had been used by almost all respondents to obtain more financing from other investors, however, not only as a signal of the quality of the investee firm, as the signalling effect literature suggests, but as a guarantor of risk. The public sector VC was perceived to provide some guarantee of continued support to both investors and other stakeholder groups.

The finding that, overall, public sector VCs were perceived to provide the least value-added was expected. However, contrary to our expectations, the difference between the public sector VC and private-sector VCs was fairly small. Furthermore, the findings suggested that private sector VCs in particular acted more professionally than informal VCs and promoted 'proper' corporate governance systems in the firm (cf. Ehrlich et al., 1994). This is reinforced by the finding that firms with a private sector VC as a lead had also more often than other firms made pre-investment development activities, probably reflecting the requirements of the VC. Still, the findings did not indicate that overall in biotechnology in Finland, private sector VCs would be the best 'fitting' VC organisation in providing non-monetary value-added to the investee firm, since the informal investors were perceived to perform better overall and to be more active in other respects.

To understand these findings, we need to have a look at the composition of the lead investors in each VC group. Among the private sector VC companies, only one represented a major investor in biotechnology. The rest were a heterogeneous group ranging from two Nordic venture capital companies to small VC firms which do not concentrate on this field of technology. We may presume that, at least, some of the investors in this group are themselves early in their institutional learning about investing in biotechnology business, or VC activity itself. Overall, VC industry in Finland has largely emerged in the past ten years (Luukkonen, 2006), has gone through one major business cycle, and overall, it is fairly early in its learning cycle about the business.

Institutional learning can also explain why the public sector VCs performed relatively well in the study. The major investor in this group was the afore-mentioned Sitra, a government-owned fund that has invested in biotechnology since early to mid 1990s. Even though each manager in Sitra has a fairly large number of firms to monitor (Luukkonen, 2006), over the years, the institution has accumulated a fair degree of expertise. This was also

highlighted by the indications of professionalism that this organisation has in its contracting practices and in the agreements on follow-on investments.

Table 11 summarises the above findings on the profiles of different types of VC. The rows summarise different dimensions of non-financial value-added and the overall value-added of and fulfilment of expectations concerning the VC as assessed by the CEOs. The major purpose of the table is to highlight the differences between the VCs. The table encapsulates the findings by indicating with 1-3 plus signs the degree to which each VC type has been perceived to be active or to highlight the given function. We emphasise that the difference between one or more plus signs does not signify order of magnitude, but rather, a ranking in terms of emphasis or activity degree.

Table 11. Summary of the different profiles of VC types

	Informal VC	Public sector VC	Private sector VC
Pre-investment development activities	+	+	++
Strategic planning	+++	+++	+++
Internationalisation & business contacts	+++	+	+
Monitoring through formal means	+	+++	++(+)
Monitoring through contacts	+++	+	+(+)
Corporate governance	+	+	+++
Signalling	+	+++	++
Overall perceived value-added	+++	+	++
Overall relationship	+	+	++

Note: in the above table, overall value-added refers to the perceived value-added and fulfilment of expectations; governance refers to the overall corporate governance, not just as a monitoring device by the VCs; monitoring refers to board meetings, frequency of contacts, contracting, and involvement in monitoring financial performance as means of monitoring the activities of the investee firm; relationship includes the closeness between VC and firm management and tensions brought about by VC.

A central observation in Table 11 is that no single VC type is very active according in all functions. Overall, the role of the informal VCs was similar to what has been found in earlier studies. An observation of note is, however, the fact that informal VCs turned out to be more actively involved in helping their investee firms in internationalisation and providing business contacts. A further major new finding in our study concerns the profile of public sector VCs, which has not attracted much attention in empirical studies. Findings concerning the public sector VCs were to some extent as expected, that is, their overall perceived value-

added was lowest. Nevertheless, public VCs were strong in the monitoring and signalling function, though perhaps in an unusual way of not signalling the quality of the investee firm, but by ensuring risk guarantee. Public sector VCs were between informal and private sector VCs in the closeness of their relationship with investee firms. In a regression analysis carried out by Maunula (2006), closeness, absence of tensions, industry experience of the CEO and VC type were significant predictors of the perceived value-added. Overall, the public sector VCs turned out to perform somewhat above expectations.

Within the evolutionary perspective, the young age and short experience of VC industry in Finland highlights that the findings that have been reported here pertain to a period when institutional learning in VC business was in an early stage. It cannot, therefore, be regarded as providing robust evidence of the general fitness of the VC types with their business environment. Rather, the findings might indicate the average stage of learning in the respective institutions at the time of the study.

The relationship between VCs and investee firms is one of co-evolution. With the advance of VC financing as an important source of financing to new technology-based innovations and with increasing knowhow of VC and biotechnology businesses, both VC and management teams of investee companies can be expected to learn/adapt to the expectations and respective roles of each. For example, management of the investee firms does not seem to value the active involvement of VC in corporate governance or monitoring financial performance, while the former can be vitally important in exits and especially if and when the investee firm is going public. This could be an indication of lacking understanding by firm management of the business and operations of the VC. The relationship between the VC and investee firm management is thus a co-evolution and a co-learning process where each partner is expected to learn of the respective roles of each other and to acquire competencies needed in the value-adding process of a new venture.

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Appendix

Appendix Table: Characteristics of venture capital ownership in the firms in the study population (N=38)

	N	%
Type of Lead Investor		
Informal VC	11	29 %
Public VC	14	37 %
Private VC	13	34 %
Number of Rounds of VC Finance		
1	7	18 %
2	15	39 %
3	9	24 %
More than 4	7	18 %
Years Since First VC investment		
Less than 3	11	29 %
3-5	14	37 %
More than 5	12	32 %
Missing	1	3 %
Current Number of VC Investors		
1	20	53 %
2	9	24 %
3	2	5 %
4 or more	7	19 %
Current Share of total VC Ownership		
1-25	10	26 %
26-50	15	39 %
51-100	12	32 %
Missing	1	3 %

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