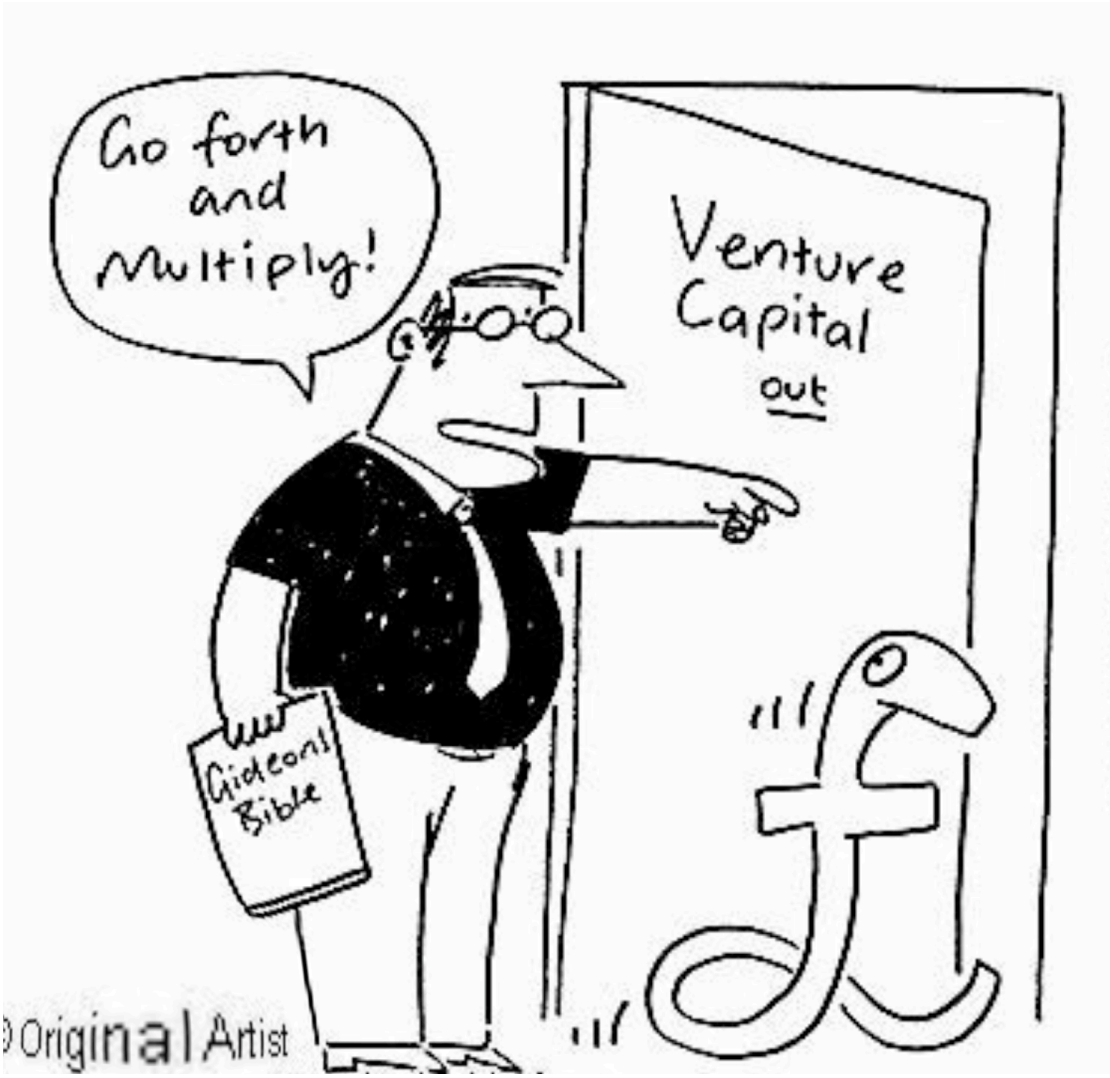


Syndicating to save money, but where to get the knowledge to spend it?

A case study about the Dutch venture capital industry.

Faculty of Geosciences
Economics and Geography
Master thesis
Niels Haars

September 2009

Universiteit Utrecht

I. Table of Contents

II. Preface

This probably is the most valuable project I have ever done. The money flow I voluntarily stopped by leaving my job as trader for ING, made me spending my savings in this last assignment needed to upgrade my academic title. This made this project a waste of money, at least in the short-term, but more importantly an absolute victory in terms of my own ambitions and persistence. Therefore, and unlike the usual disgusting thank offerings often seen in master thesis prefaces in which even pets are being thanked for supporting the process, I would like to thank only myself for doing this and Dr. Tom Broekel for assisting me. I have enjoyed his smart and helpful remarks, and our cooperation during this project. Writing a thesis is so much easier when you realize people have voluntarily applied for jobs in which this is core business. Perhaps, I have found some solace in the fact I have to write just one thesis.

A great advantage of doing this project after having worked, are the loads of free time I suddenly received again. Besides spending all this on the study, I spent lots of it on sports. I ran more than 750 kilometres in the first 4 months of the year, broke my personal record on the half marathon in Berlin, and cycled more than 4,500 kilometres since early May. Although I am excited about the fact my study career is finally finished, I am definitely going to miss all this.

The result of this lovely self managed project are now in front of you, written by someone who is in better physical condition than he ever was, a bit more academically schooled than he was, and finally lost of his unsecure feeling of not having finished something important as his masters when the finish line was so long so close. I have invested in my own assets to enjoy future returns. It is just like venture capital.

III. Abstract

Studies about interfirm relationships within the venture capital industry are usually focussed on syndication networks. Little is known about the relations venture capital firms have in order to obtain complementary knowledge needed to make and manage investments, something this case study provides insight to. It is found that venture capital firms in the Netherlands mainly use actors other than their syndication partners for this. Dutch venture capital firms seem to be careful sharing knowledge with each other due to the competition they face. Learning may however take place when they syndicate deals, but this seems to be only a by-product since financial motives are the main reason to cooperate. The knowledge relations venture capital firms have, are located as geographically dispersed as their syndication partners and both relations are mainly social in nature. Evidence is found that a large number of knowledge relations positively influences the funds' performance, as measured by number of successful exits, assets under management, and number of employees.

1. Introduction

At least one aspect the current economic crisis has made as clear as day is the importance of money that keeps flowing into the economy. When the tap is closed, businesses start drowning. Although the money slowly starts flowing again now, banks will be more careful than ever lending it, making it more difficult for young innovative enterprises to obtain the cash they ultimately need to grow. Economic recovery demands this widened funding gap to be filled, and this is where venture capital can play an important role. A good understanding of this special form of financial intermediation is therefore needed, especially in Europe where the venture capital market is structurally underperforming with the more mature US venture capital market. Venture capital has greatly emerged over the last three decades in the United States, but much less so in Europe in terms of funds raised and invested, as well as the profitability of the investments (Bottazzi and Da Rin, 2002; Rosa and Raade, 2006; Schertler, 2001).

Much has been written about venture capital, but remarkable little is known about the interfirm relationships within the venture capital industry. Studies about these relations exclusively focus on the cooperation between venture capital firms when they collectively invest in one firm, known as syndication. The motives for syndication seem to be either in line with finance theory or with the resource-based perspective, whereby a surprising difference exists between European and US venture capitalists[1]: the former primarily syndicate investments for financial reasons (Manigart et al, 2002), whereas the latter syndicate to rely on each other mainly as sources of complementary expertise rather than solely as providers of cash (Gompers and Lerner, 2001). This difference, combined with the lacking performance of the European venture capital market versus

[1] Venture capitalist(s): People working at venture capital firms.

the US venture capital market, makes it worthwhile to do further research on.

It is highly unlikely European venture capitalists do not share knowledge at all. They operate in a high-risk environment in which knowledge is an essential asset to remain competitive. Venture capitalists therefore probably have a network of actors to share knowledge with. It is already mentioned US venture capitalists use their syndication network to obtain knowledge, but for European venture capitalists it is only known they primarily use their syndication network for financial motives. This study therefore investigates which actors they use instead in their search for knowledge, where these actors are located, and how this so-called knowledge network differs from the syndication networks venture capitalists use. It is studied if and how this knowledge network affects the venture capital firms' performance. This could be relevant for the investors in venture capital.

The embeddedness literature assumes a venture capitalist to learn about investment opportunities by using his geographically localized network (Sorenson and Stuart, 2001), whereas a more critical view on the role of geographical proximity finds this role to be overreacted and argues other forms of proximity to matter as well, such as social proximity (Schamp et al, 2004; Boschma, 2005). A good understanding of the role geographical distance plays in networks is relevant, for example for local governments in their attempts to support venture capital growth. Do they have to plan geographical concentrations of venture capital firms and potential knowledge partners, or does this not make any difference at all in the way venture capital firms cooperate and perform?

In this study, the geographical as well as social distance are therefore taken into account by the comparison of a venture capital firm's syndication and knowledge network. According to my actual knowledge of the venture capital literature, there are currently no

studies providing insight to this topic. In sum, this study will focus on the following main question:

Does a venture capital firm's syndication network differ from its knowledge network in terms of geographical and social distance and how does this affect the firm's performance?

Due to a highly fragmented venture capital industry in Europe with lots of differences between countries, this study is focussed only on the Dutch venture capital industry. The results are therefore only attributable to the Dutch venture capital market, and not to the venture capital market in general. Unlike other studies about syndication, that are most quantitative in nature, I hope to contribute to the lack of knowledge about interfirm relationships within the venture capital industry with qualitative evidence collected with structured interviews.

In chapter 2 it is explained how venture capital works, where it started, and how and why venture capital markets differ across nations. In chapter 3 the relevant theoretical background is discussed and the hypotheses derived, followed by chapter 4 wherein the research methods are explained. In the fifth chapter the results are presented followed by the last chapter of this study in which the results are discussed and suggestions for further research are made.

2. About venture capital

2.1 How it started

In 1946 venture capital financing started in the United States, where Harvard professor Georges Doriot together with Karl Compton, president of the Massachusetts Institute of Technology, Merrill Griswold, chairman of Massachusetts Investor Trusts, and Ralph Flanders, president of the Federal Reserve Bank of Boston, created American Research and Development (ARD). The company raised funds from wealthy individuals and college endowments to invest in entrepreneurial start-ups in technology-based manufacturing. Nowadays, venture capital is the form of financial intermediation most closely associated with entrepreneurial start-ups, especially in high-tech industries like biotechnology, information technology and e-commerce. Famous successful companies like Amazon, Apple, Cisco, E-Bay, Intel, Microsoft, Federal Express and Starbucks all received venture capital at the initial stages of their lives (Bottazzi and Da Rin, 2002).

Before describing the development of venture capital in Europe, and the Netherlands in particular, I will first explain how venture capital actually works.

2.2 How it works

Consider an entrepreneur who invented a state-of-the-art technology in the information technology that can make him rich and famous, at least according to his own opinion. The industrial implementation, though, requires an investment of a several million Euros. His personal wealth is by far not sufficient to fund this, and banks do not want to provide a loan due to insufficient collateral. To directly tap the capital markets is not an option either and governments usually do not subsidize projects of this size and often require a proven track record.

This particular entrepreneur could consider private equity financing, for which three options remain suitable. Firstly, he could try to convince a so-called business angel (a wealthy individual) to invest in his technology. Secondly, he could find an established industrial company (a corporate venture capitalist) that is interested in the project. The last option is to contact a venture capitalist. A private equity firm is usually not an option, because they prefer to invest in more mature firms close to their initial public offering stage.

In the end, the entrepreneur decides to choose the venture capitalist. Business angels do invest in start-ups, but usually only for smaller projects. The corporate venture capitalist is also less attractive due to its slow way of making deals (especially in Europe) and the risk of not continuing their operations because of making losses for the parent company. Moreover, corporate venture capitalists are more concerned with strategic benefit than with financial return (Gupta and Sapienza, 1992).

As becomes clear in the above example, venture capital is a form of financial intermediation but one that differs substantially from a more traditional bank loan. Although the difference with private equity is not arbitrary, venture capital can be considered as the part of private equity that covers the earliest stages of a company, and typically focuses on identifying emerging industries to invest in (EVCA, 2002). Venture capitalists, as the people who run a venture capital firm are called, use their knowledge of industries and markets to provide their portfolio firms (i.e. the firms in which venture capitalists invest) with expert advice and incentives to perform better. For example, they do not provide full financing upfront, but lend their money in instalments at different stages of the firm's development, usually after pre-defined targets are met. This gives the venture capitalist some time to monitor the firms' progress without spending the whole investment amount at once, and thus keeping the option to exit firms that are not so promising as previously thought. While banks can only determine whether or not a firm should be liquidated, venture capitalists have

the possibility to learn, through intensive monitoring, whether a safe or risky continuation strategy is best (Winton and Yerramilli, 2008). Venture capitalists thereby have an important role in professionalizing the firms they invest in, for example by helping them hiring experienced financial and marketing executives (Gledson de Carvalho et al, 2008). A recent study found the companies funded by venture capital to have better management practices than firms under any other type of ownership (European Commission, 2009). According to Kortum and Lerner (2000) venture-backed companies produce more, and even more valuable, patents than non venture-backed firms. They are also faster in developing their products and introducing them to the markets. The rate of executive turnover is higher, reflecting faster managerial professionalization (Kanniainen and Keuschnigg, 2003). In short, venture capitalists can be of significant benefit to companies in enhancing their external market position and internal efficiency (Gupta and Sapienza, 1992).

2.3 How venture capitalists minimize risks

Venture capitalists do have to be aware of the possible conflicts that can arise between them and the entrepreneur, better known in the academic literature as the principal-agent problem. In this particular relation, the entrepreneur looking to finance his venture can be seen as agent, while the investor providing the funds for the venture is the principal. In order to cope with this principal-agent problem, Kaplan and Stromberg (2001) investigated the ways venture capitalists mitigate these conflicts. In general three ways can be identified: First, venture capitalists can collect information before the investment decision is made (pre-investment screening), in order to check for ex ante unprofitable projects and incompetent entrepreneurs. Second, venture capitalists can structure financial contracts to provide incentives for the entrepreneur to behave optimally. Third, venture capitalists can collect information and monitor their portfolio

companies after the investment is made (post-investment monitoring) (Kaplan and Stromberg, 2001; Sorenson and Stuart, 2001).

2.3.1 Pre-investment screening

Venture capitalists spend lots of time to evaluate and screen investment opportunities before they actually decide to invest. The attractiveness of the opportunity depends on the market size, the strategy, the technology, customer adoption, competition, the management team, and the contract terms. Especially management risk is one of the most common sources of uncertainty a venture capitalist faces. The entrepreneurs' incentives are sometimes different from that of the investors, for instance the entrepreneur's desire to continue the firm and maintain control benefits against the venture capitalist's desire to liquidate poorly performing investments (asset stripping), or conflicts can arise about the expanding strategies (Winton and Yerramilli, 2008). However, more often venture capitalists are concerned about the lack of experienced and competent members in the management team of the venture. Therefore, venture capitalists often complete their portfolio companies' management teams with experienced executives (Kaplan and Stromberg, 2001).

2.3.2 Structuring contracts

To structure financial contracts, venture capitalists usually finance their ventures with convertible securities or a combination of (zero-coupon) debt and voting equity rather then a loan solely in cash. Apart from the reason that early stage companies usually do not generate sufficient positive cash flows to support interest payments on debt, venture capitalists allocate voting rights in such a way that they can obtain full control of the venture when performance is lacking behind expectations (Kaplan and Stromberg, 2001). Several justifications are made for why the optimal contract between entrepreneur and venture capitalist should be different from debt (Admati and Pfleiderer, 1994; Bergemann and Hege, 1998; Winton

and Yerramilli, 2008). An important aspect herein, is the fact that, unlike in standard financial contracting, both the entrepreneur's efforts and venture capitalist's monitoring and managing actions are not verifiable by court, hence making it impossible to contract upon. Both sides of the relation may therefore face the risk of moral hazard. This differs fundamentally from that of a relationship between a client and bank. It is therefore argued that a simply debt contract, like a bank loan, does not work (Bottazzi and Da Rin, 2002).

2.3.3 Post-investment monitoring

Besides this role of shaping and recruiting the management team, venture capitalists are also involved in the development of business plans, assisting with acquisitions, facilitating strategic relationships with other companies, or designing employee compensation. The intensity of monitoring and supporting the portfolio firms are however subject to monitoring costs and involvement costs, which restrict the venture capitalists of spending too much time on monitoring. Kaplan and Stromberg (2001) found that in 20 percent of the investments the venture capitalist was worried the investment would require too much time to manage. This indicates that, although venture capitalists do have a monitoring and advisory role, they do not want to make too much effort in their portfolio companies (Kaplan and Stromberg, 2001).

2.4 Where venture capitalists invest in

Venture capitalists can invest in different development stages of a company. Broadly defined, four different stages can be distinguished namely seed, start-up, expansion and later stage finance. Seed finance usually is a small investment (in order of a few hundred thousand Euros) that is made to verify whether the project is feasible and economically attractive. It may well be defined as the financing provided before there is a real product or company organized (Dimov and Murray, 2008). At this highly uncertain stage, venture capitalists

assist to explore the viability of the project before investing more money in it (Bottazzi and Da Rin, 2002).

The stage in which a company does have more than just a plan but needs financing to operationalise the firm in terms of attracting employees and executives, developing a prototype, implementing marketing tests, etc., is named the start-up phase. The primary role venture capitalists have at this stage, is to help with the company organization and corporate strategy (Bottazzi and Da Rin, 2002). In the literature the seed and start-up phase is sometimes used indifferently and is better known as early stage.

Expansion finance is the investment needed to reach industrial-scale production, upgrade the production facilities and attract further employees. Venture capitalists may help finding additional financing, clients and suppliers, and in order to meet expanding growth and revenue targets, help to recruit marketing and other non-technical executives (Bottazzi and Da Rin, 2002).

Later stage investments help a company to become a market leader and unleash its earning potential. Venture capitalists assist to prepare to exit their investments either through an initial public offering (IPO), a trade sale, or by liquidating a non-performing company. An IPO is the most successful exit-route for investors, whereby the corporate stock is offered to the public on a public stock exchange. A trade sale is used to sell the company to another company, usually a large competitor. A liquidation, or write-off, is the worst exit-scenario that happens to most of the venture investments (Bottazzi and Da Rin, 2002).

2.5 How venture capitalists fund their investments and how they perform

In the United States the money venture capitalists finance their activities with, is mainly raised from institutional investors like pension funds. They are supplying nearly two-thirds of all funds, whereas in Europe this is only one-third. In contrast, in Europe the

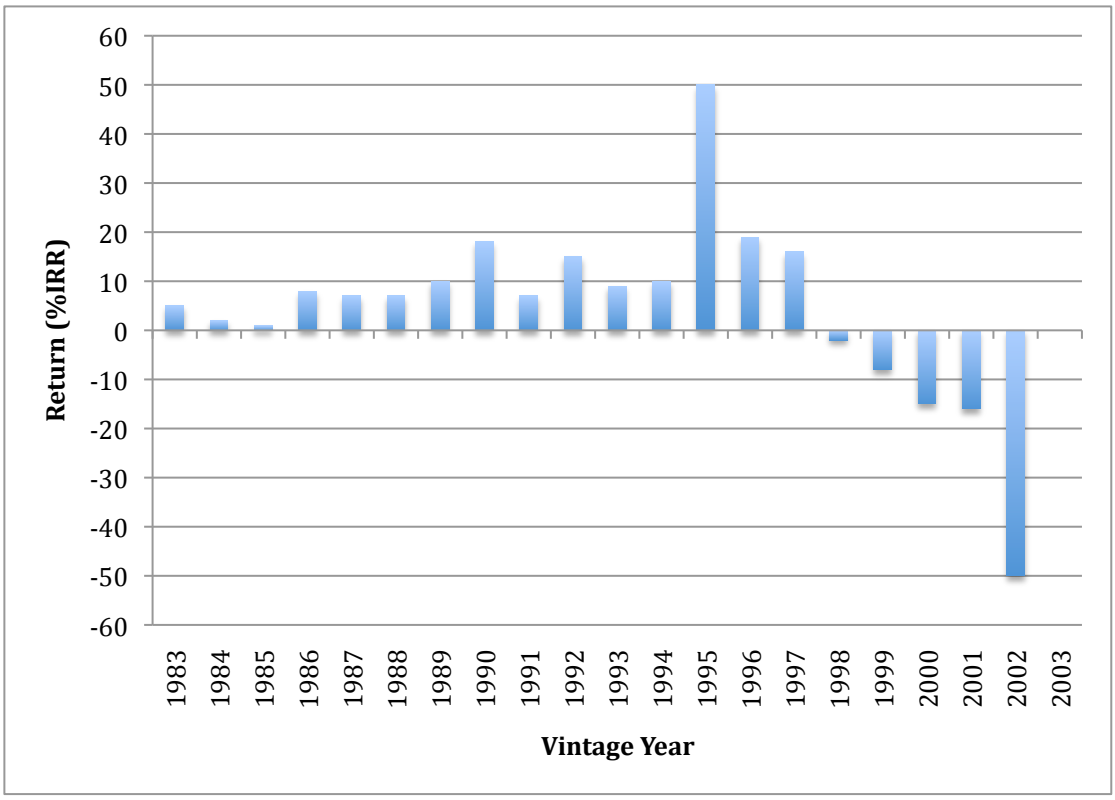
market is dominated by funding from financial institutions, mainly banks (Bottazzi and Da Rin, 2002; PriceWaterhouseCoopers, 2009). This distinction is important, since pension funds seem to affect the development of venture capital markets, while banks do not. Evidence is found that capital provided by pension funds boost significantly the overall volume of new funds raised over time (Schertler, 2001). The venture capitalists pool the raised capital in large batches called funds, typically set up with an intended lifetime of 10-12 years. The return of their investment is tied to the ability of the fund manager to pick and manage the right investments. The fund manager therefore earns fees, usually 2-2,5% per annum of funds under management plus an additional share of realised profits up to 20%. The investor receives a positive return if and when the fund realized a profit that exceeds the fees paid to the fund manager. The return of the fund depends of course on the profitability of the underlying venture investments, which are hard to value during the lifetime of the fund. Since the investments are illiquid assets, their value is only known after they have been sold what makes it difficult for an investor to exit during the lifetime of the fund (Rosa and Raade, 2006).

The value of venture capital investments usually follows a j-curve; during the early years the investment tends to lose value, but when the company develops as planned, the losses turn into gains, sometimes rising extremely fast. This means that early losses in a venture capital fund is not telling anything about future performance and does it make no sense to compare funds in their early lifetime with funds that are longer active. Therefore, to measure the profitability of venture capital funds, the internal rate of return (IRR) is most commonly used, which refer to the present value of investments and the residual of a fund. The calculation takes account of both cash and non-cash movements in assets. Herein negative cash flows include payments for investments and management fees while positive cash flows include all cash payments made by the fund to its investors as a result of exits from investments or dividends received.

Despite this calculation method, it is still difficult to measure the profitability of a venture capital fund unless a fund has been fully liquidated, because the valuation of illiquid assets remains subject to the fund manager's subjective view of the investment and market conditions (Rosa and Raade, 2006).

Figure 2.1 presents an overview of the profitability of the European venture capital industry since 1983. It shows the cumulative pooled IRR since inception, hence the total return a fund has produced during its life up to the reference point. In order to avoid the distortions caused by the j-curve effect, funds are grouped by their vintage year, defined as the year in which the first capital call is made. The negative IRRs in the period 1998-2002 can be explained by the j-curve effect, and thus, on average, funds that started in this period did not yield positive returns to their investors (Rosa and Raade, 2006).

Figure 2.1 European venture capital performance 1993-2003. Cumulative pooled average IRR since inception by vintage year as of 31st of December 2003.



Source: Rosa and Raade, 2006.

Historically, the returns generated by European funds specializing in the investment in early stage companies appear particularly poor. On average a five year during investment up to the end of 2003, yielded -1.8%, whereas the returns of an investment horizon of ten years would only have been 1.3%. This low profitability of European venture capital could be a potential danger for future levels of institutional investments. Hence, venture capital can only increase its share in total investment if its revenues exceed those of other types of investment. The declining trend in venture capital investment in 2001-2003 could already indicate a change in investors' asset allocation (Rosa and Raade, 2006).

This poor European performance contradicts with the performance of the venture capital industry in the United States, where it is more successful. The role of venture capital in fostering US innovative firms has been thoroughly studied. The consensus exists that the venture capital industry is contributing to America's strong competitiveness and economic growth. The lack of an equally developed venture capital industry in Europe hinders European firms from competing on an equal scale. Venture capital has greatly emerged over the last three decades in the United States, but much less so in Europe in terms of funds raised and invested, as well as the profitability of the investments (Bottazzi and Da Rin, 2002; Rosa and Raade, 2006; Schertler, 2001). Politicians recognize this gap between the United States and Europe as well. In November 2003, the Ecofin Council stated, "Europe still has some way to go in maximizing the potential of this sector and that a significant investment gap with the US persists" (Rosa and Raade, 2006, p. 7).

2.6 The European venture capital market

When mentioning the venture capital market in Europe, the suggestion could incorrectly be made that one general market exists without any international differences. Figure 2.2 shows the inequalities in Europe in terms of the total private equity investments

per country as a percentage of its GDP. The European venture capital industry firstly developed in the United Kingdom during the 1980s and emerged a decade later in other EU countries. In 1989 annual venture capital investment in the EU totalled £4.27bn, and increased to £26.4bn by 1999, mainly by investments in Internet technologies and services. The United Kingdom was mainly responsible for this growth, since the UK market expanded by more than six fold between 1992 and 1999, to around £11.5bn, accounting for 44% of the total. That was more than three times the size of the German and French market, and five to six times the size of the Italian, Dutch, and Swedish market (Martin et al, 2002).

The way in which venture capital finance is raised differs as well. Similar to the situation in the United States, pension funds are important investors in the United Kingdom, Ireland, Finland and Sweden, accounting for a third or more of new funds for investment. However, pension funds are less important in most other European countries, where banks are still the main supplier for venture capital finance. In the Dutch venture capital market, banks and government are the main suppliers of capital (Martin et al, 2002; Brouwer and Hendrix, 1998).

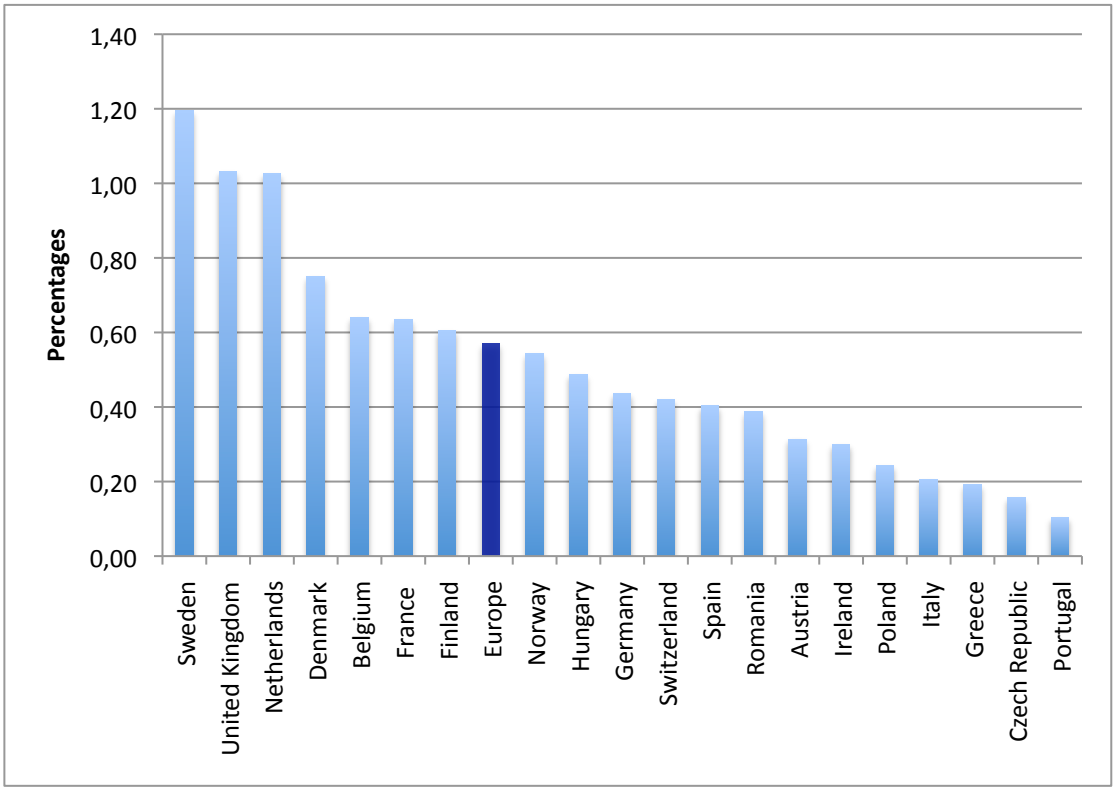
2.6.1 Factors behind variability

2.6.1.1 Active capital market

Bottazzi and Da Rin (2002) studied the factors behind the large and persistent variability of venture capital intensity across European countries. They conclude that the number of venture capital firms is much greater in those countries with an active stock market for innovative firms. Italy is the only exception, with a small venture capital industry. It is argued that the availability of active stock markets attracts venture capitalists, because it offers a viable exit method via an initial public offering (IPO) (Bottazzi and Da Rin, 2002; Gompers, 1998). Moreover, the valuation they can get when exiting their investment is on average four or five times higher than with an

acquisition or private placement. However, the larger share of revenues within the IPO category is generated by only a few ventures. Brouwer and Hendrix (1998) refer to Bygrave and Timmons who conclude that 49% of venture capital revenues are generated by only 6.8% of the investments. Revenues of venture capital investments are therefore extremely skewed (Bottazzi and Da Rin, 2002; Gompers and Lerner, 1997; Wonglimpiyarat, 2009; Martin et al, 2002; Brouwer and Hendrix, 1998).

Figure 2.2 Private equity investments as % of GDP in 2007 (by country of portfolio company)



Source: EVCA, 2009

The development of capital markets is one of the key factors cited in the success of venture capital in the United States. In contrast to the booming NASDAQ market during the 1980s and 90s, European markets lacked far behind. The European stock markets had been too small and too fragmented to provide the necessary liquidity (Martin et al, 2002). For example, in the Netherlands the Parallelmarket was

introduced in 1982. The over-the-counter stock market facilitated public offerings of venture capital backed firms. Although the market started successfully, a series of bad news broke the Parallelmarket's image in the early 90s. An overheated IPO market during the 1984-1986 period lead to a massive sell-off in the early 90s when many early stage IPOs got into serious trouble. The high initial rates of return on IPOs proved unsustainable. This drove firms (and investors) away from the market, who were now listing on the ordinary Amsterdam Stock Exchange that loosened its regulation after 1993. However, firms that were not yet profitable could still not list on the Amsterdam Stock Exchange, thereby blocking the most profitable exit route for venture capital backed firms. This Dutch example is not unique, since all other European markets experienced similar difficulties (Brouwer and Hendrix, 1998).

The opening of the Euro.nm stock market in 1997 was therefore seen as important step in supporting venture capital growth in Europe. The Euro.nm was created as an alliance of the stock markets of Amsterdam, Brussels, Frankfurt, Paris and Milan. The purpose of this pan-European network was to attract dynamic, innovative companies with high growth potential by offering them suitable admission and trading rules, based on the working of the Nasdaq stock market in the United States. The listing rules of the Euro.nm were less restrictive than those for traditional stock markets, what made it more appropriate for new ventures with bright prospects but no track record (Bottazzi and Da Rin, 2002). Although its capitalisation has grown quite fast, it has been largely due to the contribution of the successful German Neuer Markt (Martin et al, 2002). In December 2000, Euro.nm closed due to a merger of the Paris, Amsterdam and Brussels stock exchanges into Euronext. Despite its relatively high venture capital intensity, the Euro.nm never really worked in the Netherlands compared with the number of listings of German companies. Dutch companies have a tradition of listing on the Nasdaq

stock market due to possibly higher valuations in the more established US market (Bottazzi and Da Rin, 2002).

2.6.1.2 Firm ownership

It is also argued that, besides the slow development of capital markets in Europe, the influence of traditional attitudes to firm ownership is one of the main factors in explaining the immaturity of many European venture capital markets. Since many firms in Europe have been family owned and financially independent, bank loans were mostly preferred rather than equity finance. For example, German firms are more relying on bank funding than firms in the United Kingdom or United States. Italian firms are even more reliant on debt finance, with a debt to equity ratio twice that found in German companies. The highly traditional Italian industrial system is characterized by entrepreneurs reluctant to take equity partners due to the fear of possible loss of control and undesired external influence. Moreover, the stance to companies searching for equity capital has been rather negative, risking reputational damage. It is argued that these traditional practices will become less important in Europe due to the ongoing globalisation and wave of younger entrepreneurs not tied to family ownership interests (Martin et al, 2002).

2.6.1.3 Fiscal and regulatory policies

Differences in relevant fiscal and regulatory infrastructures across Europe are not helping as well in the creation of a more mature venture capital market. Double taxation of dividends or higher tax deductions for interest expenses than for dividends paid, to name an example of rules hindering the growth of demand for venture capital. High capital gains, equity taxes, complex company laws, fragmented patent laws, bankruptcy laws, and complex company registration procedures all limited the supply of venture capital. Many of the rules have already been reformed and some of the major barriers to venture capital have been lowered. For instance, Germany removed its capital

gains taxes for companies selling equity. Other states introduced specific policy measures to increase venture capital, like Denmark and the Netherlands, where a significant share of venture capital investments were backed by government guarantees in the early 1990s (Martin et al. 2002).

Of particular importance for the Dutch industry was the introduction of the *Garantieregeling Particuliere Participatiemaatschappijen* in 1981 (Brouwer and Hendrix, 1998; Schertler, 2001). This guarantee by the Dutch government gave qualified venture capital firms up to 50% restitution of investment losses. Venture capital firms could qualify if an investment did not exceed a certain size and did not hold a majority stake. The full 50% compensation was only paid in case the venture capital exited the investment within 10 years after foundation. Longer-held investments were only compensated against lower percentages. The *Garantieregeling* increased in popularity when in 1986 the maximum guarantee was raised to 4 million guilders per investment. More private investors were qualifying for the guarantee and compensation payments increased sharply, inducing the government to tighten rules. Therefore, exiting within one year after investment was not allowed anymore in 1988 and the total guarantee program was limited to 75 million guilders in 1990, further reduced to 50 million one year later. Finally, the *Garantieregeling* was terminated in 1995 (Brouwer and Hendrix, 1998).

2.7 The Dutch venture capital market

In the Dutch venture capital industry several different types of firms can be distinguished. The most common is the independent, privately owned firm. Captives, or corporate venture capitalists, are venture capital firms owned by banks, firms or insurance companies. Regional firms, to conclude, are initiated and funded by the government (Brouwer and Hendrix, 1998).

In contrast to US venture capital firms, most Dutch firms organize their funds as revolving funds or so-called evergreens, indicating that

they have an indeterminate length of life. In order to keep investors satisfied, the venture capitalist must therefore generate profits from year one on. This pressure affects the life span of venture capital firms. Brouwer and Hendrix (1998) found regional venture capital firms to have the highest survival rates, which is of course no surprise regarding their fully government support. The lowest survival rates were found among independent firms followed by the captives, with respectively 17% and 32%. Brouwer and Hendrix (1998) conclude that the pressure to produce revenues may have prompted venture capitalists to overprice stocks, which undermined investors' confidence. As a consequence, the average life span of Dutch funds was considerably lower than US standards (Brouwer and Hendrix, 1998).

However, not every venture capital firm may pursue purely financial goals. Regional firms may, for example, emphasize employment creation in their region or environmental-friendly investments. Captive venture capital firms initiated by banks provide additional services to potentially profitable market segments and try to attract new clients, while other corporate venture capitalists primarily exist to get first-hand information on new technologies, obtain technology licenses or product-marketing rights, or secure international business opportunities (Manigart et al, 2002). It is therefore no surprise that Manigart et al (2002) found independent venture capital firms to require a higher return on their investments than captives or regional venture capital firms.

2.7.1 Venture capital investments

The Dutch industry has more similarities with the US venture capital market than most other European countries. The early and expansion stage investments relative to GDP are similar in magnitude to the investments in the US. However, the investments on communication and computer-related companies and in the biotechnology and life

sciences companies are less concentrated than in the United States (Schertler, 2001).

Table 2.3 represents the distribution of total investments made in the different development stages of portfolio companies. In 2008 41% of the companies received seed or start-up financing, against 30% in 2006. Measured as percentage of the total amounts invested, in 2008 seed and start-up capital together contained 13% of the total. The average amount invested per company was 1.9 million Euros, exceeding the historic average of 0.7-0.8 million Euros which is caused by the extremely big start-up investments in the energy sector. If these investments are not taking into account, the average start-up investment per company was 0.8 million Euros in 2008 (PriceWaterhouseCoopers, 2009).

Table 2.3 Distribution investments over development stages.

	% of total amounts invested			% of total companies		
	2008	**2007**	**2006**	**2008**	**2007**	**2006**
Seed	0.6	0.1	0.6	10.7	3.5	2.1
Start/Early Stage***	12.1	3.3	2.9	30.3	43.0	27.1
Later stage	6.8			20.4		
Expansion/Bridge*	13.0	11.5	22.7	8.1	24.9	30.6
Buyout	59.3	62.4	70.6	23.6	23.0	34.1
Other**	8.2	22.6	3.1	8.8	5.7	6.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

* including bridge financing
** turnaround, refinancing, (including secondary financing, rescue/turnaround) in 2007 additional public-to-private, other PIPE
*** from 2007 start-up and other early stage
Source: PriceWaterhouseCoopers, 2009

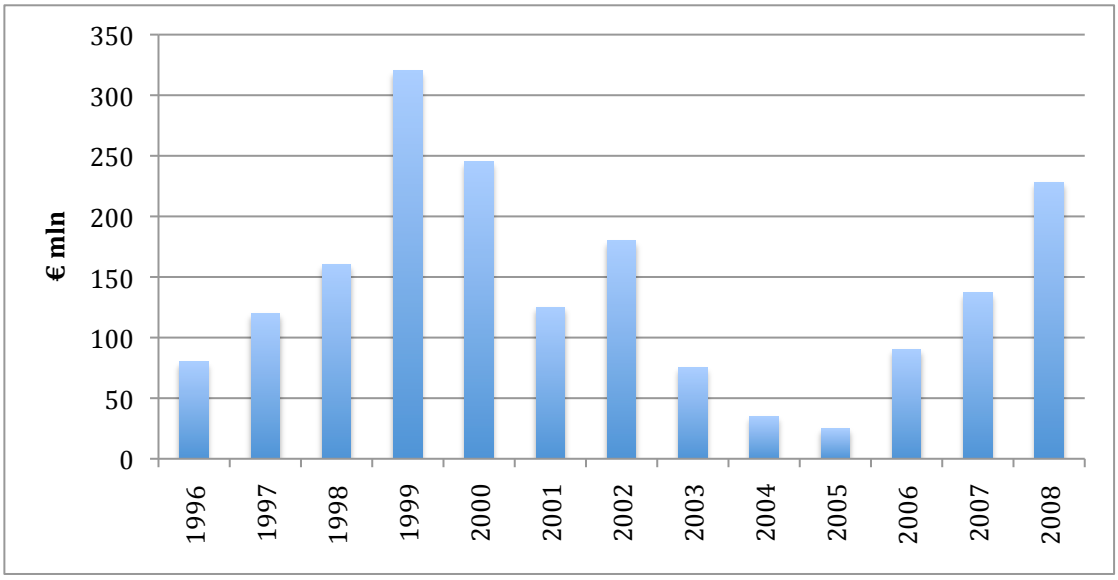
The latest available figures of the Dutch venture capital industry are based on the year 2008, and present a positive overview of the venture capital activity in the Netherlands. Despite the beginning of the credit crunch a year earlier, the total amount of venture capital investments increased to 228 million Euros, 66% more than the year before. This was largely caused by a small number of very large start-up

investments in the energy sector. According to the yearly research of the Dutch private equity sector by PriceWaterhouseCoopers the consequences of the financial crisis on venture capital investments are limited due to the long-term investment horizon investors have when investing in start-up companies. Moreover, venture capitalists are usually not dependent on bank financing. Further growth in start-up financing is expected. The formation of the TechnoPartner Seed facility in 2004 is seen as important cause for this development. It is a public subsidy program to help stimulate venture capital activity focused on technology companies by providing loans to start a new fund. The loan could be as high up to the start value of the fund with a maximum amount of 4 million Euros. There are already 22 funds using this subsidy (PriceWaterhouseCoopers, 2009).

2.7.2 High volatility

Figure 2.4 gives an overview of the development of venture capital investments in The Netherlands for the years 1996-2008. The total amounts invested are highly volatile over time, something not unfamiliar for the venture capital industry in general (Gompers, 1998; Gompers et al, 2008). This volatility is associated with shifting valuations and activity in public equity markets. It is argued that increases in initial public offering valuations positively affect the funds venture capital firms raise. Usually, this process is overreacted resulting in periods in which too many competing companies are funded, followed by ones in which capital is too scarce. The boom in 1998-2000 is the most recent example of such a process. The investments in this period grew enormously and were concentrated in just a few areas, mainly Internet related business and telecommunication. In the meantime, other areas experienced a lack of funding because all venture capitalists put their eggs in one basket (Gompers et al, 2008).

Figure 2.4 Development venture capital financing, 1996-2008



Source: PriceWaterhouseCoopers, 2009

Reasons behind this process of high investment activity can be sought on either the supply or demand side of venture capital. The former is related to behavioural biases of venture capitalists that irrationally associate past investment successes with future investment opportunities, or just follow the herd preventing reputational risk of being seen as unsuccessful contrarians (Gompers et al, 2008). This leads to the overreaction, mentioned earlier. Explanations based on the demand side, are not associated with overreaction but changes in the industry's fundamentals. It is argued that fluctuations in venture capital investment activity are just a response to changes in investment opportunities (Gompers et al, 2008).

Winton and Yerramilli (2008) add to the explanation of overreaction by taking into account the cost of capital venture capitalists have. When these costs decrease, the number of firms that receive venture capital financing increases. This leads to more firms that pursue risky strategies, at least part of the time, because firms that would have opted for bank finance and conservative strategies now switch to venture capital finance. Although this increase in risky activity supports the adoption and expansion of innovative products, the risky

strategies still have the potential to fail. A boom in venture capital finance could therefore sometimes be followed by a bust (Winton and Yerramilli, 2008).

2.7.3 Location of venture capital firms

Most of the venture capital firms in the Netherlands are located in the Randstad area. The development of the venture capital industry in both the United States and the United Kingdom usually occurred nearby the existing major metropolitan centres of financial activity. Because many venture capital firms are formed by spin-offs from existing financial institutions or are linked to these institutions, they tend to locate near the centres of financial activity. Besides, they can get easy access to pools of knowledge, expertise and the concentrations of potential investors (Martin et al, 2002).

This concentration of venture capital firms may also affect the spatial dispersion of the investments they make. Venture capitalists depend on access to personal networks and face-to-face contact in finding and evaluating investment opportunities. Mason and Harrison (1991) found that most firms have a limited geographical range of activity due to the frequent visits to potential clients and existing portfolio firms, which is usually one to two hours travel from their office location. It is also found that a significant supply of experienced venture capitalists in a region will stimulate increased demand for venture capital funding. The United Kingdom and France do both have high degrees of regional concentration in venture capital investment. In the Netherlands the degree of concentration is apparently less, but still contain some marked regional inequalities in levels of investment. Almost a third of the investments in 1998 were done in the province Noord-Holland, followed by the provinces Noord-Brabant and Zuid-Holland with 19% and 18% of the total respectively. The more peripheral regions in the Netherlands attract only a minor share of the investments (Martin et al, 2002). Innovative firms in these regions may therefore experience a disadvantage due to a poor

availability of capital, often called a regional equity gap, that can contribute to uneven regional development. This problem can be solved by syndication of investments if one of the investors is located close to the investment (Fritsch and Schilder, 2006; Sorenson and Stuart, 2001).

3. Theory

3.1.1 Spatial concentration of venture capital firms

In the academic world, studies about venture capital can be found in the economic, geographic and sociological literature. Most often, these studies focus on the spatial distribution of either venture capital firms or the spatial distribution of their investments and the factors that influence this. The general view is that venture capital is geographically concentrated and that their investments are unevenly distributed across space (Martin et al, 2002; Fritsch and Schilder, 2008).

The concept of spatial concentration of industry is a topic frequently discussed in geography (for example: Porter, 1990). Spatial concentration is generally explained by positive feedback processes that might result from the geographic spillover of knowledge across firm boundaries but within small areas (Krugman, 1991). Although the absence of physical or economic constraints on the mobilization of resources through space, new firms will locate near existing firms of the same type. They will do this to establish local markets for scarce inputs, such as a skilled labour pool, or to gain early exposure to knowledge produced by nearby firms (Sorenson and Stuart, 2001; Martin et al, 2002). Consensus about the desirability of spatial concentration in the venture capital is not clear though. The European Commission argued that the venture capital market in Europe suffers from being segmented into national markets, but also lacks behind because of a lack of geographical clustering. Others say it is already too geographically localised, mentioning the disproportionately located venture capital invested in the more dynamic and buoyant regions, resulting in a widening gap with less prosperous regions (Martin et al, 2002).

3.1.2 Spatial concentration of venture capital investments

The uneven distribution of investments is the other topic attracting researchers' attention. In their search for potential investments, venture capitalists exhibit highly localized investment patterns in both physical and industry space. In general, this is influenced in two ways.

First, to find an appropriate investment target venture capitalists have to acquire information about the existence and characteristics of opportunities to invest in, as well as the quality of these opportunities. Because these tasks are more difficult at a distance, it is more likely to find these investment opportunities nearby (Sorenson and Stuart, 2001; Fritsch and Schilder, 2008). The identification and evaluation of investment opportunities usually requires tacit knowledge, which is derived from experience such as skills and intuition (Weber and Weber, 2007), and therefore mainly transferred through personal contact within a local business community (Florida and Smith, 1993). The venture capitalist can therefore screen the area where he is located for potential targets or utilize his network with other financiers to find an interesting company to invest in. Of course, potential target companies located near the venture capital firm can also approach the venture capitalist directly. Assumedly, companies in close proximity to the venture capital firm will be more likely to do this than companies in distant regions (Fritsch and Schilder, 2008).

Second, because the relationship between venture capitalist and entrepreneur requires frequent face-to-face contact, the venture capital firms usually prefer to be within easy commuting distance of their investments (Martin et al, 2002; Sorenson and Stuart, 2001). It is argued that geographical distance may shape the amount of transaction costs associated with the necessary task of monitoring and supervising the financed firm. A distant investment generates higher transaction costs than a comparable investment nearby ceteris paribus, thus potentially influencing the venture capitalist's decision (Sorenson and Stuart, 2001; Fritsch and Schilder, 2008).

Besides the influence of geographical distance between the venture capital firm and the portfolio firm on the transaction costs associated with monitoring and supervising of that firm, there are more factors involved. It is argued that the development stage of the portfolio company matter as well. Companies in the very early stages of its technical and organizational development are more likely to require a higher level of involvement by the venture capitalist than companies at a later stage (Gupta and Sapienza, 1992; Gygac and Griffiths, 2007). New ventures typically face liabilities of newness and smallness, which make the investment risky because business models and organizational skills don't have proven their desired outcome yet (Stinchcombe, 1965). Moreover, venture capitalists face strong information asymmetries in their investment relation, because entrepreneurs know more than they do about the company and opportunities they seek funding for. The higher levels of monitoring and supervising investments in earlier stages may therefore cause higher costs than later stage companies. Thus, spatial proximity could be more important for early stage investments (Sorenson and Stuart, 2001; Fritsch and Schilder, 2008).

3.2 Syndicating investments

Unfortunately, a venture capitalist can minimize but not exclude his risk by monitoring and supervising the portfolio firms. Venture capitalists do expect poor performance of the majority of the firms they invest in (Knill, 2004), and therefore diversify their investments across different ventures. Hereby they are not solely relying on economic factors. The ability to assist and monitor portfolio companies is gained through experience and acquired external knowledge. It is likely venture capitalists will not invest in companies or industries they have had difficulties generating profits with in the past. They will copy previous successful strategies and decisions or imitate it from others. This process, in which organizations copy other

similar organizations in response to uncertainty, is called *mimetic isomorphism* (Sorenson and Stuart, 2001; Gygac and Griffiths, 2007).

Syndication is seen as another suitable strategy for venture capitalists to diversify by spreading risks and simultaneously gaining more experience through sharing the opinions of others (Gompers and Lerner, 1999). A syndicate involves two or more venture capital firms taking an equity stake in an investment, either in the same investment round, or more broadly defined, at different points in time (Manigart et al, 2002, p. 3). In such an investment, the so-called 'lead investor' undertakes the main tasks of monitoring and consulting with the venture whereas the co-investors are involved with the management to a considerable lesser degree (Fritsch and Schilder, 2008, p. 2116). Syndication as a means of risk sharing is based on the traditional perspective developed from finance theory. This perspective shows that risk can be reduced without reducing return simply by building a well-diversified portfolio. The risk of an investment consists of a firm specific component (non-systematic risk) and a market component (systematic risk). In finance theory it is argued that holding a well-diversified portfolio of investments can eliminate the former risk component, but that it is unable to eliminate market risk. However, it is even difficult for venture capital firms to obtain a fully diversified portfolio compared to institutional investors who invest in listed stock. This is because of the strong information asymmetries in the investment relation, which is less of a problem in listed companies, and because of the capital constraints of venture capital firms. Syndication can be a solution to invest in a deal that otherwise would have been too large to finance alone, and moreover, it gives the opportunity to invest in a larger number of portfolio companies than it could do without syndication, resulting in more diversification and less overall risk of the venture capital fund (Manigart et al, 2002).

Another argument for syndication is the relative illiquid character of venture capital investments. Because the assets cannot be

continuously traded, the venture capitalist will face difficulties when an investment turns out to be more risky than anticipated. Exiting the investment is difficult due to the illiquid assets, but syndication can be a solution to help reducing the overall portfolio risk (Manigart et al, 2002).

Window-dressing can be a good explanation for syndication as well, although it is hard to prove. In order to attract enough investments in future rounds and keep existing investors happy, venture capitalists avoid structural underperformance of their funds compared to their competitors. They therefore may seek investments in later stage successful ventures in which they can participate as syndication partner. Although the venture already proved to be successful and most of the value building already occurred, they just want to have such an investment on their books to pay off (Manigart et al, 2002; Lerner, 1994).

3.2.1 Spreading of risks or sharing of knowledge?

Besides the financial motives, syndication may also be used to overcome the space-based constraints venture capitalists experience with new ventures at distant locations. Individual venture capitalists have investment expertise that is both sector-specific and location-specific that can be transferred through syndication (Hochberg et al, 2007). Sorenson and Stuart (2001) demonstrate the declining likelihood that a venture capitalist invests in a new venture when the distance between them increases. This can be disadvantageous, as Manigart et al (1994) demonstrated. They found European venture capital firms with a local investment scope to have a lower return than companies with a broad geographical investment scope. By syndication of investments venture capitalists can reduce the disadvantages of spatial distance to a portfolio company, because it is less important for the co-investors to need frequent face-to-face contact (Sorenson and Stuart, 2001; Fritsch and Schilder, 2008). In this way, it is possible to invest in areas it would have been difficult to

obtain access to otherwise. The probability a venture capitalist will invest in a distant company increases if there is a syndicate partner located near the target company with whom they have previously co-invested (Sorenson and Stuart, 2002).

Manigart et al (2002) found the financial motives for syndication to be important for European venture capitalists, but found no evidence for other motives. In contrast, although some studies acknowledge the importance of financial motives as drivers of syndication, Gompers and Lerner (2001) found that in the United States syndicate members rely on each other mainly as sources of complementary expertise rather than solely as providers of cash. Herein, venture capitalists face a trade-off between choosing partners that can give access to additional industry experience and associating with venture capitalists in similar network positions. The latter has the risk of loosing an existing competitive advantage vis-à-vis that competitor. This is, for instance, studied by Hopp (2008), who found that venture capitalists occupying similar positions within the venture capital network to be less likely to work together on a specific transaction.

3.3 Resource-based perspective

These findings are in line with the resource-based perspective, that views syndication as a response to the need to share or access information in the selection and management of investments, that was already used more than two decades ago by Bygrave (1987). He found that venture capitalists gain access to a network by having knowledge that other firms need. He argued that when there is more uncertainty, there is more co-investing, even though the average amount invested per portfolio firm is less. The primary reason for co-investing, he concludes, is thus the sharing of knowledge rather than spreading of financial risk (Bygrave, 1987).

For analyzing interactions within the venture capital industry, Bygrave (1987) used the resource exchange model developed by Pfeffer and Salancik. The theory consists of three variables, namely

concentration (1) –defined as the number of competing firms in an industry, munificence (2) –which is the availability or scarcity of resources, and interconnectedness (3) –the number and pattern of linkages among organizations. These three independent variables determine how organizations interact, which in turn is characterized by the variables conflict and interdependence to determine the amount of uncertainty an organization has to cope with (Bygrave, 1987). I will detail the various variables and link their application to the venture capital industry to show the usefulness of the view for this study.

3.3.1 Concentration

Pfeffer and Salancik argued that concentrated industries would lead to more interorganizational links, which reduce uncertainty in market competition and in sources of supply. To achieve this, concentrations must neither be too high, nor too low. Reasoning behind is that when there are only a few firms in an industry, there is hardly any need to improve coordination. When the opposite is true, and an industry consists of many firms, it is impossible to have enough links to improve coordination noticeably. Bygrave classifies the venture capital industry as having intermediate concentrations at most. The venture capital firms are both competitors and suppliers to each other, since they compete for the same investment targets and also share deals in the form of syndications (Bygrave, 1987).

3.3.2 Munificence

The main resources a venture capital firm needs to operate are money, a pool of potential companies to invest in, and people to manage the investments. These resources can be scarce now and then, as described in the previous chapter. Bygrave (1987) argues that in case of scarce investment opportunities, venture capital firms feel more pressure to share investments on the assumption that the sharing will be reciprocated.

3.3.3 Interconnectedness

The last variable in the resource exchange model is interconnectedness. The most important reasons for organizations to interconnect is to gather information, to transmit information, to obtain commitments and support, and legitimate the organization. Interconnectedness makes the organization help to stabilize its environment and reduce uncertainty. As described earlier, venture capitalists share knowledge to find and evaluate investment opportunities. It is more likely a firm invests in a proposal that is referred to them by colleague firms than one that comes without any lead (Sorenson and Stuart, 2005). In general, a higher level of uncertainty leads to greater interconnectedness. According to Bygrave (1987), the level of uncertainty depends on the innovativeness, the technology, investment stage, and industry segment of the portfolio companies a venture capitalist invests in. Thus, by analysing the portfolio companies, the frequency of networking among venture capital firms can be determined (Bygrave, 1987).

Based on this story so far, it is possible to derive the first hypothesis. In contrast to the US venture capital market, European venture capitalists do not primarily syndicate deals to exchange information but consider financial motives to be more important. In line with the resource-based view, companies operating in a highly uncertain environment –like venture capitalists- do need to interact to share or obtain valuable information. In case this is not happening through the venture capitalist' syndication network, another network does probably exist through which the venture capitalist can obtain knowledge. Therefore;

(H1) In order to obtain knowledge, Dutch venture capitalists will use relations other than its syndication partners.

3.4 Networks and the notion of embeddedness

Networking among (venture capital) firms also receives much attention from sociologists, although their view is slightly different. In contrast to the resource-based perspective, they see firms in a broader perspective being part of complex social structures and relations. Economists are blamed for having an 'under-socialised' view of economic relations that emphasizes rational, self-interested behaviour that is hardly affected by social relations. Neo-classical economists assume actors to operate independently and maximise their utility, whereby goods and services are exchanged in one-off deals, based solely on price and exchange signals (Boschma et al, 2002).

According to sociologists Polanyi (1944) and Granovetter (1985) this view is overly simplistic. They propose the notion of embeddedness to indicate that economic relations are embedded in social relations that go beyond strictly rational and monetary values. Social ties affect economic outcomes and can be defined as socially embedded in case the relation or tie between actors involves trust based on friendship, kinship and experience. Most organizations are embedded in a variety of interorganizational networks, such as board interlocks, trade associations, and research and development ventures. Participation in such networks can give access to trustworthy information about the availability, capabilities, and reliability of potential partners. These trust-based relationships are seen as elements that support economic behaviour and development (Gulati and Gargiulo, 1999; Boschma et al, 2002; Boschma, 2005).

3.4.1 Transaction costs

For instance, it is argued that these trust-based relations in economic coordination have the potential to reduce the risk of opportunistic behaviour and therefore lowering the costs of interacting (Boschma et al, 2002). Because explicit contracts often lack sufficient detail to include all opportunities for firms to prevent violating of the contractual agreements, participants face the risk that their trading

partners behave opportunistically. In this situation, a partner takes advantage of the close relationship to use resources or information in ways that may damage the partner's interests (Gulati and Gargiulo, 1999). In response to this risk, actors will use their social networks to select partners they trust, because there is less need to specify all the details of a transaction in formal written contracts. The advantage of dealing only with known partners lowers the cost of searching for and screening of potential partners and also reduces the need to control and monitor transactions (Sorenson and Stuart, 2005; Putnam, 1993).

3.4.2 Exchange of knowledge

Besides the positive effects of embeddedness on lower transaction costs, embedded relationships also favour the transmission and exchange of knowledge and information and, thus, learning and innovation (Boschma et al, 2002). Granovetter (1973) demonstrated with his classic work on the strength of weak ties how the characteristics of a network determine the transmission of transaction-relevant information across the participants in a market. Weak ties are appropriate for the transfer of information across large social distances and an efficient way to access new ideas or codified knowledge. Each weak tie in a network provides just a little information, but in sum, a large number of weak ties give access to a large pool of knowledge. On the other hand, strong ties are needed for the exchange of tacit knowledge, which is, by nature, much more difficult to communicate and to trade through markets. It requires more close and intense interaction for learning to take place, something that is more efficiently done with strong ties compared to weak ties. Therefore, different kinds of networks exist providing different kinds of information. Dense networks, composed of small numbers of strong and interconnected ties, produce more stable knowledge systems. Less dense networks, composed of a large number of unconnected weak ties, produce more dynamic, and open

access to different kinds of information and ideas (Granovetter, 1973; Wasserman and Faust, 1994). According to Bygrave (1987), who adopted the work of Granovetter on the venture capital industry, ties are most likely to be weak when venture capitalists are new entrants, are fading, or having a low frequency of their interactions. When the opposite is true, one can speak of strong ties (Bygrave, 1987).

In the economic geography the notion of embeddedness has been widely adopted, because it can be used to strengthen the argument that firms are still strongly linked to their local production environment unless a world of increasing globalisation. Geographical proximity can stimulate embedded interfirm relationships because short distances favour information contacts and exchange among actors. Moreover, short distances also facilitate informal relationships (Boschma et al, 2002; Sorenson and Stuart, 2001; Sorenson and Stuart, 2005; Gygax and Griffiths, 2007).

3.4.3 Embeddedness and venture capital

To adopt the notion of embeddedness on the venture capital industry, it is assumed that the venture capitalist will use his geographically localized network to learn about private investment opportunities. Sorenson and Stuart (2001) showed that venture capital firms with a history of provincial investment patterns and those without central positions in the industry's syndication network tend to invest locally. On the contrary, those who have formed many and dispersed relations with other venture capital firms invest more frequently in spatially distant companies. Hence, the variation in actors' positioning within the structure of the market appears to differentiate the ability of these actors to overcome boundaries that otherwise would curtail exchange (Sorenson and Stuart. 2001). Hochberg et al (2007) found this variation in actors' positioning to have performance consequences for venture capital funds. Funds managed by venture capital firms that enjoy more influential network positions have significantly better performance as measured by the proportion of portfolio investments

that are successfully exited through either an initial public offering or a sale to another company. Economically, venture capitalists benefit the most from having a wide range of relationships, especially when these venture capital firms are involved in other well-developed networks as well (Hochberg et al, 2007).

It is important to note that embedded outcomes do not necessarily result only from purely positive interactions, as shown by Trapido (2007). Trust-based cooperation could emerge between competitors through the same mechanisms as in positive interaction, when economic actors mimic each other's behaviour showing familiarity and intense mutual learning. Through repeated interaction, familiarity, trust and cooperation will increase, and it is therefore likely that cooperation between two firms is positively related to the intensity of past competition between these firms. Trapido (2007) found evidence from the venture capital industry that supports this view. Past competition for investment targets significantly increases the chance that venture capital firms become co-investment partners. This process was not restricted to firms located in a cooperative regional business culture like the Silicon Valley. Although the venture capitalists there are eager to cooperate, it is the geographical proximity that wholly accounts for this tendency (Trapido, 2007).

The notion of embeddedness is used to construct the next hypotheses. It is argued that geographical proximity can stimulate the formation of embedded interfirm relationships, having a positive effect on lower transaction costs and favouring the exchange of knowledge. Since I expect to find a difference between a venture capitalist' syndication network and knowledge network, it is obvious to take account of the role geographical distance may have on both networks. Because the syndication network is used primarily for financial motives or to overcome spatial boundaries in investment decisions, it is assumable venture capitalists will select partners whom they trust to lower transaction costs. Although this relationship could be formed with

former competitors, the mechanisms behind are the same as for positive interactions. Knowledge partners, on the other hand, may be seen as the ties with whom knowledge could be exchanged. It is already argued that venture capitalists use their network to learn about investment opportunities.
Both networks therefore fit in the notion of embeddedness and there is no reason to expect a difference in geographical distance between venture capitalist and its syndication network or knowledge network. The second hypothesis is formulated as follows:

(H2) No difference in geographical distance is expected between venture capital firms' syndication partners and knowledge partners.

With regard to the performance of venture capital firms and the notion of embeddedness, it is argued that they economically benefit the most from having many relationships, especially when these venture capital firms are involved in other well-developed networks as well. This leads to hypotheses number 3a and 3b:

(H3a) The more syndication partners a venture capital firm has, the better performance the venture capitalist will have.
(H3b) The more knowledge relations a venture capital firm has, the better performance the venture capitalist will have.

3.5 Knowledge and proximity

It would be incorrect to state that embedded relations are necessarily of a local nature, taking into account Boschma's (2005) critical view on the impact of geographical proximity on the likelihood of knowledge exchange and innovative performance. He argues that the importance of geographical proximity cannot be assessed in isolation, but should always be examined in relation to other dimensions of proximity that may provide alternative solutions to the problem of coordination. Boschma (2005) bases his view on the work of the French School of

Proximity Dynamics where in the 1990s a key contribution to the literature was made stating that proximity covers a number of dimensions and means a lot more than just geography.

3.5.1 Cognitive proximity

Geographical proximity usually refers to the spatial or physical distance between economic actors. I mentioned earlier that it is often claimed in the literature that when actors are spatially concentrated they will benefit from knowledge externalities. Basically this is true, but it is unlikely firms will benefit through monitoring without knowing how to absorb and use this external knowledge themselves. In contrast to neoclassical economists' assumption that knowledge is a public good produced outside the economy, more recent approaches to the theory of the firm consider companies not solely as repositories of knowledge, but also as processors of knowledge (Schamp et al, 2004). In order to reduce uncertainty, firms conduct routinized behaviour when they search for new knowledge, whereby they will search in close proximity to their existing knowledge base. Knowledge creation and innovations are therefore often cumulative and localized outcomes of search processes within firms, with a high degree of tacit knowledge. To effectively transfer this knowledge, firms require an absorptive capacity to identify, interpret and exploit the new knowledge (Cohen and Levinthal, 1990). One can speak of cognitive proximity when actors share the same knowledge base and expertise (Boschma, 2005).

However, too much cognitive proximity may be disadvantageous for learning and innovation. To develop new ideas and increase the potential for learning it is often required to have dissimilar, complementary bodies of knowledge, hence the aforementioned weak ties. Too much proximity may also easily lead to cognitive lock-in, the process in which routines within an organization obscure the recognition on new technologies or new market possibilities. It is comparable with the 'never change a winning team' dilemma in sports;

it is difficult to unlearn habits or routines that have been successful in the past, but which have become redundant over time. To conclude, for firms to be effective in learning, a not too great cognitive distance between firms increases effective communication, while some cognitive distance must be maintained in order to avoid lock-in and access to dissimilar bodies of knowledge (Boschma, 2005).

3.5.2 Organizational proximity

Another dimension of proximity Boschma (2005) argued to be beneficial for learning and innovation as well is organizational proximity. It can be defined as the extent to which relations are shared in an organizational arrangement either within or between organizations. Based on this definition, low organizational proximity means a lack of ties between independent actors, whereas high organizational proximity is characterized as a hierarchically organized firm or network. Because new knowledge creation is accompanied by uncertainty and opportunism, strong control mechanisms are required to reduce these by ensuring ownership rights and the support of own investments in new technology by giving sufficient rewards. Notwithstanding, in reality the mechanisms usually don't exist due to the high transaction costs involved. A hierarchically organized firm or network can provide a solution to these problems, since strong ties can provide the essential feedback needed for the transfer of complex knowledge (Boschma, 2005).

Too much organizational proximity, though, is believed to be unfavourable to learning. The risk of lock-in in specific exchange relations can emerge when strong ties limit access to various sources of novel information. Besides, a hierarchical form of governance lacks feedback mechanisms so that new ideas are not rewarded and interactive learning is difficult to happen. So while too little organizational proximity lacks control mechanisms increasing the danger of opportunism, too much organizational proximity goes along with a lack of flexibility (Boschma, 2005).

3.5.3 Social proximity

Social proximity also belongs to the relevant forms of proximity. This is actually derived from the embeddedness perspective mentioned before. It is argued that the more socially embedded the relationships of a firm are, the more interactive learning should take place. However, there may be considerable negative effects of too much social proximity. When relations are based on emotional bonds of friendship and kinship, embedded ties hold the possibility of underestimating opportunism. Besides, long-term relationships may lock members of social networks into established ways of doing business, thereby neglecting their own innovative and learning capacity (Boschma, 2005; Gulati and Gargiulo, 1999).

3.5.4 Institutional proximity

Socially embedded relations do not include situations in which people share sets of values such as ethnic and religious values. These will be reckoned to the broader institutional framework. Institutions are 'sets of common habits, routines, established practices, rules, or laws that regulate the relations and interactions between individuals and groups' (Boschma, 2005, p. 68). A distinction can be made between formal institutions, like laws and rules, and informal institutions, like cultural norms and habits. Institutions are so-called 'rules of the game' for collective action, influencing the way actors behave and therefore reducing uncertainty and lowering transaction costs. In sum, institutional proximity is the provider of stable conditions in which interactive learning can take place. Too much institutional proximity, however, is unfavourable for new ideas and innovations due to either the obstruction of opportunities for newcomers or hindering of development of new innovations that require new, or adaptation of old, institutional structures (Boschma, 2005).

3.6 The questionable need of geographical proximity

It was argued that a combination of geographical proximity and some level of cognitive proximity would be sufficient for interactive learning to take place. However, it is even questionable if geographical proximity is needed at all. Since the availability nowadays of advanced information and communication technologies, networks do not necessarily have to be spatially concentrated to be effective. Rallet and Torre in Boschma (2005) demonstrated in a study on research projects that tacit knowledge could be transmitted across large distances through a combination of organizational proximity and cognitive proximity. A clear division of precise tasks that are coordinated by a strong central authority (organizational proximity) together with partners who share the same cognitive experience (cognitive proximity) make the need for geographical proximity rather weak. Although the exchange of tacit knowledge in this example still requires face-to-face contact, bringing people together now and then without permanent co-location could solve this problem (Boschma, 2005). Asheim and Isaksen (2002) also found evidence confirming geographical proximity is definitely not a prerequisite for learning to take place. A case study of firms in regional clusters in Norway proved the electronics industry in Horten to be dependent on knowledge providers located outside the region. They conclude that cooperation may be stimulated when people have the same kind of education and share the same formal knowledge (Asheim and Isaksen, 2002).

A similar critical stance is found in Schamp et al (2004), who stated that the meaning of geographical proximity in the concept of embeddedness is usually highly overestimated and other forms of proximity that contribute to establish the social relationships of economic actors to be underestimated. They found that for the acquisition of transactions, firms in the M&A-business all rely on the recommendations of friendly enterprises. These informal contacts are mainly the result of prior acquaintances through projects, but on the personal level they found university studies, conferences or club and

association membership, and to a lesser extent shared working experience in another firm, to be the important factors behind this informal networking. Although geographical proximity is supporting this, it is neither a necessary nor a sufficient condition (Schamp et al, 2004).
It can thus be concluded that other forms of proximity may act as a substitute for geographical proximity.

This critical view on the impact of geographical proximity leads to the following and last hypothesis of this study. Since this research is only focused on venture capital firms based in The Netherlands, it would make no sense to include the dimension of institutional proximity, since all firms in the sample are subject to similar formal and informal rules. Cognitive and organizational proximity are, according to my opinion, not suitable for this research as well. Due to the fact that most of the venture capital firms in The Netherlands are just small companies in terms of number of employees and all of them are highly educated, I do not expect to find any interesting differences in organizational or cognitive proximity that might have an effect on the ability to exchange and absorb knowledge. The dimension of social proximity might however be important with respect to this research. Because social embedded relationships may facilitate the exchange of knowledge, it is likely a venture capitalist will have knowledge relations at closer social proximity than its syndication relations. Therefore:

(H4) A venture capitalist' knowledge relation is expected to be in closer social proximity than its syndication relation.

4. Methods

4.1 Sample

To test the hypotheses, data is used from qualitative interviews. A sample was chosen of all venture capital firms located in The Netherlands that are member of the industry association of private equity firms in the Netherlands, the *Nederlandse Vereniging van Participatiemaatschappijen* (in short: NVP). To increase the number of firms in the sample, a database of investment data accessible on the website of the NVP was used, containing the investments made in the period 1948-2009 of NVP members as well as other Dutch non-members. I only analyzed investments that occur after 1989, as I have concerns about the completeness of the data prior to 1989. Firms were selected when at least one of their investments was made in the early stage of a company and at least one investment was syndicated with another Dutch venture capital firm. To check whether the data was still actual and accurate, all selected firms' websites were checked manually to compare the data of the NVP with the portfolio data published on their websites. A sample of 43 companies remained.

Of all the firms in the sample, a randomly selected number of 15 firms were selected. The general partner or investment manager of the selected firms were considered to be the key-person to interview, because of their general knowledge about the company and specific knowledge about the investment process and use of relevant actors in this process. These persons were selected via the firms' websites and phoned directly whether they would like to participate. When the key-person reacted positively, an appointment for the interview was made, usually within 1 to 2 weeks after the first 'cold-call'. In the end 4 companies did not cooperate, leaving a sample of 11 firms, and a non-response rate of 26,67%.

Of these 11 firms, 2 firms were regional venture capital firms backed by the government, while the others were independent venture capital firms. Although these regional firms usually have different goals than independent venture capital firms, there is no reason to expect this to have a different effect on the use of syndication or knowledge networks. Therefore, these firms were not eliminated from the sample.

4.2 Measures

In order to get a more in-depth understanding on the way venture capitalists cooperate, structured interviews were preferred to a postal questionnaire. Moreover, the chances to get a better response rate are higher, and I had not to worry about self-selected samples and incomplete questionnaires. The interviews were conducted by telephone, to save time, costs, and to increase the chance of cooperation. If a respondent preferred to do the interview face-to-face, this option was offered, but only occurred once.

The interviews were held in Dutch, in June and July 2009, and lasted on average 30 to 40 minutes per interview. The first interview was used to test the initial questions, whereupon one categorization was adapted and one open-ended question could be closed. The interview can be found in the Appendix of this thesis. Please note that not all the questions in the interview are relevant for this study, since dr. Tom Broekel of Utrecht University was at the same time involved in a research project on venture capital, additional questions were added to the questionnaire to join forces and create economies of scale.

4.2.1 Network

In order to construct the syndication network, the investment database of 1,048 investments was used. When a company appeared more than once in the database as an investment of two or more venture capital firms, no matter the year this investment was done, it was qualified as syndication. This is in accordance with the definition of syndication as described by Manigart et al (2002).

In search for the principal reasons behind the syndication of investments, the respondents were asked whether or not they syndicate to share risk, to get deals which are too large to fund alone, to overcome information asymmetries, to prevent competition with other venture capital firms, or reasons other than the ones I mentioned.

Before the knowledge network is constructed, the respondents were asked if they could indicate in percentage terms the relative importance of knowledge acquired outside the venture capital firm versus knowledge acquired inside the venture capital firm, adding up to 100%. Thereupon, the respondents were asked if they could name the key persons and/or organizations their firm is in contact with for the exchange of investment knowledge. Investment knowledge was broadly defined as the knowledge essential for the recognition of potential investments, information about new market developments, new market trends, and new technologies, but also knowledge required to invest, manage and exit investments. This investment knowledge can be considered as the knowledge needed to fulfil the pre-investment and post-investment roles a venture capitalist has, according to Sorenson and Stuart (2001). The respondents had to indicate how important these persons and/or organizations are for their firms' performance, on a 5-point scale ranging from 1='not important' to 5='very important'.
To check whether this key person and/or organization possess investment knowledge that is similar to that of the venture capital firm, and therefore able to provide the venture capitalist with complementary and similar knowledge, the respondents had to rate this similarity on a 5-point scale ranging from 1='not similar at all' to 5='identical'.

4.2.2 Distance

Geographical distance is measured in kilometres as well as travel time in minutes. Like other venture capital studies wherein distance is measured (Zook, 2002; Fritsch and Schilder, 2008), travel time is chosen to nuance the relative meaning of distance measured in kilometres. A 30-kilometre trip in the Randstad could take as much time as 50 kilometres in the north of The Netherlands. To calculate the distance between venture capitalist and its syndication partner and venture capitalist and its knowledge relation, the postal codes of every linkage were inputted in the *Routeplanner* available on the ANWB website (www.anwb.nl). This program plans the fastest route by car between two points, measured in time, estimated on average speeds in The Netherlands outside rush hour.

4.2.3 Performance

Several indicators were used to measure the venture capitalist's performance. First, the respondent was asked how many employees, in full time equivalents, are working in the company, and what this number was 3 years ago. An increase in number of employees could indicate a positive outlook on the future, more portfolio companies to manage, or higher earnings for the venture capital firm to allow an increase in personnel, caused by realized exits or increased funds under management. Second, the respondent was asked how many funds the firm currently manages, and what this number was 3 years ago. When a venture capital firm performs well, more investors' money can be attracted to form an additional fund while the current funds are still active. Hence, higher returns lead to greater capital commitments to new funds (Gompers and Lerner, 1997). Third, the respondent was asked for the number of successful exits, either through an IPO or trade sale, the firm realized in the last 3 years and in the last 10 years. This is a well-adopted indicator for venture capital firms' performance (Nahata, 2008). Accordingly, the respondent was asked what the average return on investment was in

these 3 or 10 years. Fourth, the respondent was asked to indicate the current value of assets under management, what this value was 3 years ago, and what it was 10 years ago. Since performance positively influences fundraising (Gompers, 1998), this question indicates the venture capitalist firm's performance over time.

4.2.4 Social proximity

In this study, it is argued that a relation between actors can be defined as socially embedded when this relation involves trust based on friendship, kinship and experience. The more socially embedded the relation is, the more social proximity there is. In the literature an extended range of methodologies is used to measure social proximity, for example the intensity analysis used by Weber and Weber (2007) or the co-ethnicity Agrawal et al (2008) used as key measure. The big differences in definitions and methodologies used to capture the notion of embeddedness could be the consequence of the broad or vague definition of it. Granovetter stated that actors are embedded in concrete, ongoing systems of social relations, but neither explained what these ongoing systems actually are nor what the mechanisms are behind becoming embedded (Granovetter, 1985; Rutten, 2004). Uzzi (1996) found "embedded ties to develop primarily from third-party referral networks and previous personal relations which (1) set expectations for trust between newly introduced actors and (2) equip the new economic exchange with resources from pre-existing embedded ties" (Uzzi, 1996, p. 679). "Embedded ties often are established in new interfirm relationships because individuals know one another from other social circles as co-workers, schoolmates, friends, or kin" (Uzzi, 1996, p. 680).

In this study I used several binary indicator variables to measure the social proximity between venture capital firm and its syndication and knowledge relations, based on the findings of Uzzi (1996). The relation is checked and coded accordingly whether both actors in the relation match positively ('1') or not ('0') on one or more pre-defined

embeddedness-indicators, namely *working career, study and university, NVP membership, and syndication frequency*. I explain the indicators one by one.

4.2.4.1 Working career

It is argued that there are many ways in which actors can be embedded in social relations at several levels (Oinas, 1997). Important reason to choose for the indicator 'working career' is the fact that a common past enhances the development of trust. Granovetter (1985) stated that there is no better information about a partner's reputation than information from one's own past dealings with that person. For example, people who worked for the same company may know each other, experienced the same corporate culture and therefore are more likely to get involved in trust-based relations compared with people who do not share working careers.

4.2.4.2 Study and university

For the same reasons, the indicator *study and university* is used. Uzzi already mentioned schoolmates as important example through which interfirm relationships can evolve. In order to get a match on this indicator, not only the study actors have followed must be equal, but also the university at which they did this. I argue that this can embed actors in social relations because they share a common past on education, probably teachers, place of study, and alumni network. A good example of how actors could be linked through study and university is the Insead Private Equity Club, a community formed of the business school' MBA-alumni that are living in The Netherlands and active in the private equity industry (Insead, 2009).

4.2.4.3 NVP membership

Membership of the industry association of private equity firms in The Netherlands may bring actors together through conferences or other networking activities, the NVP common code of conduct and the membership code, that can enhance the formation of trust between members (NVP, 2009).

4.2.4.4 Syndication frequency

Repeated interaction can increase the formation of trust, based on shared experiences. Therefore, more than one syndicated investment with the same partner would fit into this explanation.

4.2.5 Data processing

All relevant members (general partners, investment managers) within the venture capital firms in the sample were carefully screened on working career, and study and university using the firm's website and Linkedin, and checked for similarities with its syndication partners and knowledge partners. A '1' is given if at least one match exists, a '0' when no link is found. Whether the venture capital firm is a NVP member ('1') or not ('0'), was checked on the NVP website. The syndication frequency is found thanks to the investment database mentioned earlier, whereby a '1' was given when the venture capital firm made at least 2 syndicated investments with the same partner, and '0' if the venture capital firm syndicated less deals with the partner.

All the '1's and '0's for every relation were inputted in the social proximity matrix, found in the Appendix. Every indicator is considered equally important for the forming of trust-based relations, since no justifications are found to make differentiations herein. Therefore, the more '1's a relationship has, the more social proximity there is.

4.3 Data analysis

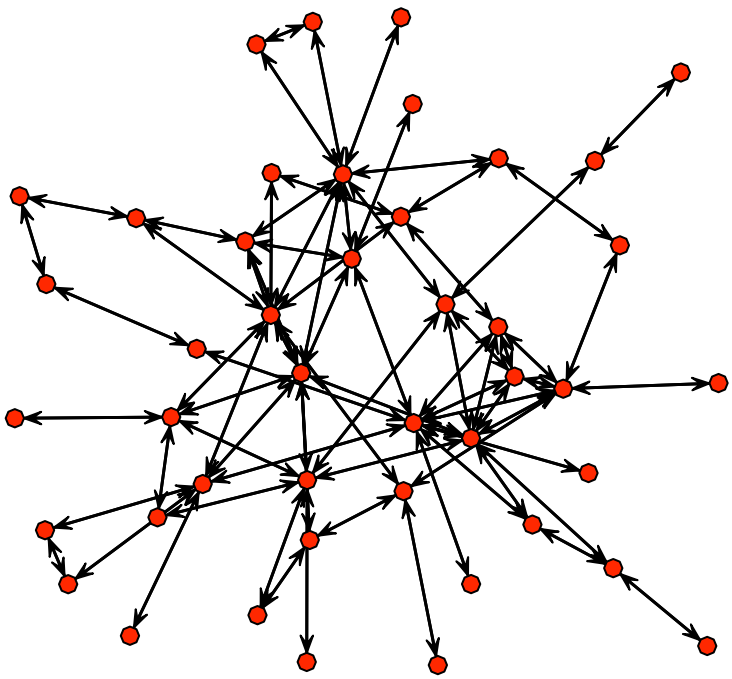
In order to check whether the average geographical distance to syndication partner in the randomly selected sample is representative for the average geographical distance in the start-sample of 45 companies, a t-test is used.

5. Results

The 43 companies in the sample syndicated on average 27% of their deals. This is considerably lower then the percentage of syndicated deals in the United States, 60%, but in line with Europe, where 30% of the venture capital investments in 2001 were syndicated (Casamatta and Haritchabalet, 2007). Figure 5.1 visualizes the linkages between venture capital firms (the red dots) within the syndication network.

Based on the interviews, it seems that the principal reasons behind the syndication of investments are indeed subject to financial motives. This is in line with the findings of Manigart et al (2002) for European venture capitalists. Only one respondent named information asymmetries as a reason to syndicate investments, but considered the sharing of risk and the need of additional funds of other firms to complete deals to be more important.

Figure 5.1 The Dutch syndication network



Some respondents explicitly explained why they do not use syndication partners for the exchange of knowledge. One respondent's quote best summarizes the opinion of most respondents in this study with respect to syndicating and the exchange of knowledge: "I don't invest in areas I don't have full knowledge of. When I do not have the knowledge about a particular industry, I will not invest. Hence, syndicating has nothing to do with knowledge for us."

Investment knowledge seems to be partly present inside the venture capital firm and partly accessible outside the firm. Most respondents indicated to be dependent on knowledge acquired outside the venture capital firm and indicated that these actors possess complementary knowledge for the firm. The relevant actors the venture capital firm is in contact with for the exchange of knowledge is a diverse group, consisting of research institutes like TNO, technology transfer offices, universities, and key persons in the industry the venture capital firm focuses on. It is common that the largest investors in the firms' funds are also named to be important key persons with valuable knowledge.

Other venture capital firms were named as knowledge partner as well. Some respondents answered that they were in contact with other venture capital firms for the exchange of knowledge, but most of the time only when they work together on an investment. Another respondent works together closely with another venture capital firm it spun-off from some years ago. Based on the respondents' reactions, it seems syndication is always the only reason to contact a venture capital firm in the first place, like one respondent explained: "You have to be careful sharing knowledge with other venture capital firms. Unless you syndicate or have the intention to syndicate, you will contact them, but still, they are competitors." Or according to another respondent: "You do not simply call another venture capital firm to discuss the market or investment opportunities, without having the intention to syndicate with them."

To summarize, Dutch venture capitalists seem to be rather careful sharing knowledge with other venture capital firms. They are not seen

as sources of complementary knowledge, but purely as competitors. When venture capitalists are syndicating deals, they may learn from each other, but financial motives remain the principal reason for both to cooperate. Thus, for the conscious exchange of knowledge, venture capitalists seem to be dependent on actors other than their syndication partners. This confirms hypothesis 1.

An average geographical distance between venture capital firm and syndication partner of approximately 85 kilometres was found, with an estimated travel time of 57 minutes. The geographical distance to a venture capitalist's knowledge partner was much harder to measure accurately, because some respondents could not simply name the most relevant actors they are in contact with. For example, one respondent searches his relevant actors dependent on the deal he is involved in and could therefore not name the most important ones and two other respondents did not use any knowledge source outside the firm. The actors the other respondents named to be important for the exchange of knowledge are located at an average distance of 64 kilometres with an estimated travel time of 44 minutes. When the average distances to syndication partners and knowledge partners are compared, 2 respondents have knowledge partners at more distant locations than their syndication partner, whereas 5 respondents find their knowledge partners on average at more geographical proximity than their syndication partners. A Wilcoxon signed rank test, which is included in the Appendix, reveals that the differences found in geographical distances between a venture capitalist's syndication and knowledge partner are not significant. Despite the small sample, hypothesis 2, stating that no difference in geographical distance between venture capital firms' syndication and knowledge partners is expected, can thus be confirmed. Of course, more research is needed to get a more powerful result on this hypothesis.

Only 2 respondents are working for firms that are founded before the year 2000, while 6 firms are founded in 2006 or after. Only 1 firm has

fewer employees working there now, when compared with 3 years ago. The other firms' work forces remain steady over the years, or even expanded. On average a venture capital firm consists of 4 persons, not including one regional capital firm where more than 50 persons are working.

Five respondents made at least one successful IPO in the last 10 years. The return on investment over the last 3 years of these venture capital firms ranges from -10% to 30%. The other firms argued to be too short in business for divesting and were therefore not able to give return on investment figures.

The number of funds the firms manage remain steady over time, whereas the assets under management has grown for almost all firms, ranging from current values of 4.5 to 103 million Euros.

A venture capital firm's performance could be dependent on the number of knowledge partners, as can be carefully concluded based on the findings in this study. Two respondents who stated to have all knowledge inside the firm and who are not using knowledge partners at all, did not face an expanding workforce -one had even fewer employees working in the firm than 3 years ago- and did not make any successful IPO so far. Their funds under management did not change over time. This is contrasting with for example one respondent who is using 8 important knowledge partners and expanded its workforce from 2 employees in 2006 to 8 now, or another respondent that made 4 successful IPO's in the last 3 years, and stated to be using a great knowledge network remaining from his time working for a big private equity firm in the Netherlands. The longest active capital firm in the sample also uses several knowledge partners, and constantly performs very well over the years. This respondent remarked that "knowledge is very important in this business and it is impossible to have all that knowledge already within your company".

The venture capital firms' performance in relation to the number of syndication partners seems to be less clear to base conclusions on. The firm with the biggest syndication network has 5 different

syndication partners, whereas 3 firms only have 1 syndication partner. However, a clear difference with respect to the performance of these firms is missing. More evidence is needed to check whether there is a relation between a venture capital firm's performance and the number of different syndication partners it has. To conclude, hypothesis 3a is not confirmed, whereas hypothesis 3b can be confirmed.

Eleven of the twenty-five intensively researched syndication relations score at least one point on the self-designed social proximity scale. In 3 relations a common working career is found, 5 relations with common study and university, 5 relations in which both venture capital firms are NVP member, and in 4 relations the venture capital firms have syndicated more than 1 deal together. In 14 relations no social proximity between the venture capital firms is found.
Of the 29 specified knowledge relations, 18 of them score at least one point on the social proximity scale. Especially former contacts from venture capitalists' working career are used for the exchange of knowledge. This important form of social proximity was clearly confirmed by some respondents. One respondent argued that all his knowledge partners are existing long-term social contacts, and another respondent explained that their knowledge partners were all former colleagues or relations of the firm's directors. Moreover, these social contacts save the firms a lot of money, like one respondent explained: "Why should I spend 50,000 Euros on a flashy PowerPoint presentation about the telecom industry made by a famous advisory office, if I have some friends in the industry whom I could give a call, for free."
However, no significant differences are found between the venture capital firm's social distance to syndication partner and knowledge partner. Based on the findings it is impossible to tell whether knowledge partners are more socially close related than syndication partners, or vice versa. It seems that when a venture capital firm does

not have social proximity to its syndication partner(s), it does not have social proximity to its knowledge partner(s) as well. This probably tells something about the importance people in these venture capital firms attach to the usage of social networks.

In sum, it can be concluded that in most relations a venture capital firm has, at least some level of social proximity is present, but no difference herein is found between syndication and knowledge partners. Therefore, hypothesis 4 is not confirmed.

6. Discussion

This case study provides more insight in the way venture capital firms obtain knowledge needed for the investments these firms make and manage. It is thereby contributing to the scarce literature about interfirm relationships within the venture capital industry. Earlier studies found European venture capital firms to syndicate deals primarily for financial reasons, whereas their US counterparts are doing this mainly to obtain complementary knowledge from their syndication partners. In addition to these findings, this study examined if venture capital firms are cooperating with actors other than their syndication partners in order to exchange knowledge.

Based on the present case study conducted in the Netherlands, it is found that venture capitalists are syndicating deals primarily for financial motives. This is in line with other venture capitalists in Europe, as earlier found by Manigart et al (2002). To obtain knowledge, venture capitalists in the Netherlands are dependent on various actors, like research institutes, universities, businesses, and key persons in the industry the venture capital firm is focussed on. Other venture capital firms are used as well, but only when the firms are syndicating or have the intention to syndicate together. This knowledge sharing is just a 'by-product' of syndication, since financial motives are far more important for the firms to get involved in syndicated deals. In general, venture capitalists in the Netherlands seem to be very careful about sharing knowledge with other venture capitalists because of the strong competition they face. Further research in this field is desirable to get a better understanding of how this reluctance to cooperate develops, and why this stance differs compared to US venture capitalists who are much more willing to cooperate, even in a market where there is more competition.

The number of knowledge partners seems to have an effect on the venture capital firms' performance. Firms with a larger knowledge network perform better on funds performance and employment growth

within the venture capital firm. A relation between the number of syndication partners and performance was not found. Since syndication partners are used for financial motives, like the sharing of risk and access to potential deal flow, it is rather remarkable no clear relation is found. However, this could be the result of the small sample used in this study, and the relative high number of young companies without track record.

The knowledge partners venture capitalists use, are located on an average geographical distance of 66 kilometres from the venture capital firm. This is not significantly different from the geographical distance between syndication partner and venture capital firm. Differences on social distances between syndication and knowledge relations are not found either, but it seems that most of these relations contain a degree of social proximity. Contacts from former careers, old study mates or closely related investors are common backgrounds in the relation a venture capital firm has with either its syndication or knowledge partner. The validity of the methods used to measure social distance is questionable, since it is only indicating possible social relationships without actually knowing they exist. Better research methods are needed, although I am currently not aware of a brilliant method that can measure social distances. Further research is needed to get a better understanding of how these social networks within the venture capital industry are formed and if it matters, with respect to a firm's performance, what type of contact (e.g. former colleagues, or old study mates, etc.) it is.

The findings in this study are limited to the Dutch venture capital market only. Since the European venture capital market is characterized by great international differences in terms of development, I am not sure this study can be used in a greater context. Besides its theoretical use, this study has some practical implications as well. Investors in venture capital should be aware of the networks venture capital firms have, especially the networks the firms use to obtain knowledge, since this seems to have a positive

effects on their funds' performance. Policymakers should use this study to realize relationships within the venture capital industry are mainly social in nature and not purely arm's-length. Geographical distance seems therefore not to constrain any form of cooperation. This makes it unlikely governments can play a role in supporting the venture capital industry by involvement in the spatial distribution of venture capital firms.

7. References

ADMATI, A.R. and PFLEIDERER, P. (1994), Robust financial contracting and the role of venture capitalists. In: *Journal of Finance,* 49, 2, pp. 371-402.

AGRAWAL, A., KAPUR, D. & J. McHALE (2008), How do spatial and social proximity influence knowledge flows? Evidence from patent data. In: *Journal of Urban Economics,* 64, pp. 258-269.

ASHEIM, B.T. and ISAKSEN, A. (2002), Regional innovation systems: The integration of local 'sticky' and global 'ubiquitous' knowledge. In: *Journal of Technology Transfer,* 27, pp. 77-86.

BERGEMANN, D. and HEGE, U. (1998), Venture capital financing, moral hazard, and learning. In: *Journal of Banking and Finance,* 22, 6-8, pp. 703-735.

BOSCHMA, R.A. (2005), Proximity and Innovation: A critical assessment. In: *Regional Studies,* 39, 1, pp. 61-74.

BOSCHMA, R., LAMBOOY, J. & V. SCHUTJENS (2002), Embeddedness and innovation. In: M. Taylor and S. Leonard, *Embedded enterprise and social capital.* Aldershot: Ashgate, pp. 19-35.

BOTTAZZI, L. and DA RIN, M. (2002), Venture capital in Europe and the financing of innovative companies. In: *Economic Policy,* pp. 231-269.

BROUWER, M. and HENDRIX, B. (1998), Two worlds of venture capital: What happened to U.S. and Dutch early stage investment? In: *Small Business Economics,* 10, pp. 333-348.

BYGRAVE, W.D. (1987), Syndicated investments by venture capital firms: A networking perspective. In: *Journal of Business Venturing,* 2, pp. 139-154.

CASAMATTA, C. and HARITCHABALET, C. (2007), Experience, screening and syndication in venture capital investments. In: *Journal of Financial Intermediation,* 16, pp. 368-398.

COHEN, W.M. and LEVINTHAL, D.A. (1990), Absorptive capacity: A new perspective on learning and innovation. In: *Administrative Science Quarterly,* 35, 1, pp. 128-152.

DIMOV, D. and MURRAY, G. (2008), Determinants of the incidence and scale of seed capital investments by venture capital firms. In: *Small Business Economics,* 30, pp. 127-152.

EUROPEAN COMMISSION (2009), Private equity and venture capital in the European economy: An industry response to the European Parliament and the European Commission. Brussels: European Commission.

EVCA (2002), Survey of the economic and social impact of venture capital in Europe. Research paper, The European Private Equity and Venture Capital Association.

FLORIDA, R. and SMITH JR., D.F. (1993), Venture capital formation, investment, and regional industrialization. In: *Annals of the Association of American Geographers,* 83, 3, pp. 434-451.

FRITSCH, M. and SCHILDER, D. (2006), Is venture capital a regional business? The role of syndication. In: *Discussion Papers on Entrepreneurship, Growth and Public Policy,* 2506, pp. 1-25.

FRITSCH, M. and SCHILDER, D. (2008), Does venture capital investment really require spatial proximity? In: *Environment and Planning A,* 40, pp. 2114-2131.

GLEDSON DE CARVALHO, A., CALOMIRIS, C.W. & J.A. DE MATOS (2008), Venture capital as human resource management. In: *Journal of Economics and Business,* 60, pp. 223-255.

GOMPERS, P.A. (1998), Venture capital growing pains: Should the market diet? In: *Journal of Banking and Finance,* 22, pp. 1089-1104.

GOMPERS, P., KOVNER, A., LERNER, J. & D. SCHARFSTEIN (2008), Venture capital investment cycles: The impact of public markets. In: *Journal of Financial Economics,* 87, pp. 1-23.

GOMPERS, P.A. and LERNER, J. (1997), Risk and reward in private equity investments: The challenge of performance assessment. In: *The Journal of Private Equity,* 1, 2, pp. 5-12.

GOMPERS, P.A. and LERNER, J. (1999), An analysis of compensation in the U.S. venture capital partnership. In: *Journal of Financial Economics,* 51, pp. 3-44.

GOMPERS, P.A. and LERNER, J. (2001), The venture capital revolution. In: *Journal of Economic Perspectives,* 15, pp. 145-168.

GRANOVETTER, M. (1973), The strength of weak ties. In: *American Journal of Sociology,* 78, 6, pp. 1360-1380.

GRANOVETTER, M. (1985), Economic action and social structure: The problem of embeddedness. In: *American Journal of Sociology,* 91, 3, pp. 481-510.

GULATI, R. and GARGIULO, M. (1999), Where do interorganizational networks come from? In: *The American Journal of Sociology,* 104, 5, pp. 1439-1493.

GUPTA, A.K. and SAPIENZA, H.J. (1992), Determinants of venture capital firms' preferences regarding the industry diversity and geographic scope of their investments. In: *Journal of Business Venturing,* 7, pp. 347-362.

GYGAX, A.F. and GRIFFITHS, A. (2007), Do venture capitalists imitate portfolio size? In: *Financial Markets Portfolio Management,* 21, pp. 69-94.

HOCHBERG Y., LJUNGGQVIST, A. & Y. LU (2007), Whom you know matters: Venture capital networks and investment performance. In: *The Journal of Finance,* 62, 1, pp. 251-301.

HOPP, C. (2008), Are firms reluctant to engage in inter-organizational exchange relationships with competitors? In: *Economic Letters,* 100, pp. 348-350.

INSEAD (2009), Insead Private Equity Club. 5 Jul. 2009 <http://www.insead.edu/mba/clubs/ipec/>.

KANNIAINEN, V. and KEUSCHNIGG, C. (2003), The optimal portfolio of start-up firms in venture capital finance. In: *Journal of Corporate Finance,* 9, pp. 521-534.

KAPLAN, S.N. and STROMBERG, P. (2001), Venture capitalists as principals: Contracting, screening, and monitoring. In: *The American Economic Review,* 91, 2, pp. 426-430.

KNILL, A. (2004), Should venture capitalists put all their eggs in one basket? Diversification versus pure play strategies in venture capital. Working Paper, University of Maryland at College Park.

KORTUM, S. and LERNER, J. (2000), Assessing the contribution of venture capital to innovation. In: *Rand Journal of Economics,* 31, 4, pp. 674-692.
KRUGMAN, P.R. (1991), Increasing returns and economic geography. In: *Journal of political economy,* 99, 3, pp. 483-499.

LERNER, J. (1994), The syndication of venture capital investments. In: *Financial Management,* 23, pp. 16-27.

MANIGART, S., JOOS, P. & D. DE VOS (1994), The performance of publicly traded European venture capital companies. In: *Journal of Small Business Finance,* 3, 2, pp. 111-125.

MANIGART, S., WAELE, K. DE, WRIGHT, M., ROBBIE, K., DESBRIÈRES, P., SAPIENZA, H.J. & A. BEEKMAN (2002), Determinants of required return in venture capital investments: a five-country study. In: *Journals of Business Venturing,* 17, pp. 291-312.

MARTIN, R., SUNLEY, P., & D. TURNER (2002), Taking risks in regions: The geographical anatomy of Europe's emerging venture capital market. In: *Journal of Economic Geography,* 2, pp. 121-150.

MASON, C.M. and HARRISON, R.T. (1991), Venture capital, the equity gap and the 'north-south' divide in the United Kingdom. In: M.B. Green, *Venture Capital: International Comparisons.* London: Routledge.

NAHATA, R. (2008), Venture capital reputation and investment performance. In: *Journal of Financial Economics,* 90, pp. 127-151.

NVP (2009), Nederlandse Vereniging van Participatiemaatschappijen. 1 May 2009 <http://www.nvp.nl>.

OINAS, P. (1997), On the socio-spatial embeddedness of business firms. In: *Erdkunde,* 51, pp. 23-32.

POLANYI, K. (1944), The Great Transformation. Boston: Beacon Press.

PORTER, M.E. (1990), The competitive advantage of nations. New York: Free Press.

PRICEWATERHOUSECOOPERS (2009), Ondernemend vermogen: De Nederlandse private equity-markt in 2008.

PUTNAM, R.D. (1993), Making democracy work: Civic traditions in modern Italy. Princeton: Princeton University Press.

ROSA, C.D.M. and RAADE, K. (2006), Profitability of venture capital investment in Europe and the United States. Brussels: European Commission, Directorate-General for Economic and Financial Affairs Publications.

RUTTEN, R. (2004), Inter-firm knowledge creation: A re-appreciation of embeddedness from a relational perspective. In: *European Planning Studies,* 12, 5, pp. 659-673.

SCHAMP, E.W., RENTMEISTER, B. & V. LO (2004), Dimensions of proximity in knowledge-based networks: The cases of investment banking and automobile design. In: *European Planning Studies,* 12, 5, pp. 607-624.

SCHERTLER, A. (2001), Venture capital in Europe's common market: A quantitative description. Kiel Institute of World Economics Working Paper.

SORENSON, O. and STUART, T.E. (2001), Syndication and the spatial distribution of venture capital investments. In: *The American Journal of Sociology*, 106, 6, pp. 1546-1588.

SORENSON, O. and STUART, T.E. (2005), The evolution of venture capital investment networks. Harvard Business School Working Paper.

STINCHCOMBE, A.L. (1965), Social structure and organizations. In: J.G. March, Handbook of Organizations, pp. 153-193. Chicago: Rand McNally.

TRAPIDO, D. (2007), Competitive embeddedness and the emergence of interfirm cooperation. In: *Social Forces,* 86, 1, pp. 165-191.

UZZI, B. (1996), The sources and consequences of embeddedness for the economic performance of organizations: The network effect. In: *American Sociological Review,* 61, 4, pp. 674-698.

WEBER, B. and WEBER, C. (2007), Corporate venture capital as a means of radical innovation: Relational fit, social capital, and knowledge transfer. In: *Journal of Engineering and Technology Management,* 24, pp. 11-35.

WINTON. A. and YERRAMILLI, V. (2008), Entrepreneurial finance: Banks versus venture capital. In: *Journal of Financial Economics,* 88, pp. 51-79.

WONGLIMPIYARAT, J. (2009), The influence of capital market laws and initial public offering (IPO) process on venture capital. In: *European Journal of Operational Research,* 192, p. 293-301.

ZOOK, M. (2002), Grounded capital: venture financing and the geography of the Internet industry, 1994-2000. In: *Journal of Economic Geography,* 2, pp. 151-177.

8. Appendix

Questionnaire

Questionnaire "The Dutch Venture Capital Industry"

All information is treated confidentially, i.e. it will not be possible for anyone to identify your firm and name. Moreover, no individual firm or organization will be mentioned in any publication based on these interviews.

Your identification number:
Your function:
If "other" please specify:

Part 1: Firm information

1. a) In what year was your firm established?
1. b) In case of merger or acquisition indicate also the year in which the most recent merger or acquisition took place.

1. c) How much of your firm's turnover can be attributed to venture capital activities?

2.) Is your firm owned by another organization
If "yes" is this relevant in daily business?

3.) Has your firm always been located in its current location?
If "No":
i. Where was it located before?
ii. When did your firm move?

4. a) Could you please indicate how many employees (full-time equivalents) are working in your firm?
4. b) What was this number 3 years ago?

5.) What are the main activities for achieving competitiveness of your firm (multiple selections possible)?
Selection of investments (portfolio firms)
Contractual agreement / legal arrangements
Managing / monitoring investments
Fundraising
Exiting phase (IPO, buyout)
Participating in or initiating syndication
Other
If "other" please specify:

6.) On which phase of firm development is your firm focused
Pre-Seed
Seed
Expansion
Bridge
Pre-IPO financing

7.) Please name the three most important sectors your firm invested in the past.
Indicate their importance form 1 (relative low) to 5 (relative high)
Sector 1:
Sector 2:

Sector 3:

8.) Why do you engage in syndication investments?
Sharing of risk
Investments are too large for a single firm
Information asymmetries
Preventing of competition
Other
If "other" please specify:

9.) In the last 3 years, has the firm carried out changes any of the following?
a) Selection of investments
b) Contractual arrangements
c) Managing and monitoring portfolio firms
d) Exiting strategies
e) Fundraising
f) Firm's general strategy
g) Organizational structures
h) Target industries

10.) Financial performance
a) How many funds does your firm currently manage?
b) What was this number 3 years ago?
c) How many successful exits (IPO / take-over) did your firm realize in the last 3 years?
d) How many successful exits (IPO / take-over) did your firm realize in the last 10 years?
e) What was the average return on investment of your firm in the last 3 years
f) What was the average return on investment of your firm in the last 10 years
g) What is the current value of all the firm's funds (aggregated)?
h) What was the value of all the firm's funds 3 years ago (aggregated)?
i) What was the value of all the firm's funds 10 years ago (aggregated)?

11.) What is the educational level of the employees? Please indicate the share (%) of the following (adding up to 100%)
a) Higher than Bachelor's degree:
b) Lower than or equal to Bachelor's degree:

12.) What is the educational background of the employees?
Please indicate the share (%) of the following disciplines (adding up to 100%)
a) Sciences (including economics / finance / social sciences)
b) Technical studies like engineering
c) Artistic studies like arts, media etc.
d) Other

13.) Please indicate from which of the following organizations you recruit your highly skilled employees.
Please indicate their relative importance from 1 (not important) to 5 (very important).
a) Universities
b) Technical institutes
c) Other venture capital firms
d) Firms (other sectors)

14.) Please indicate from which of the following three spatial levels
(regional, national, international) you recruit your highly skilled employees.
Please indicate their relative importance from 1 (not important) to 5 (very important):

	Regional	National	International
Universities	--12345	--12345	--12345
Technical institutes	--12345	--12345	--12345
Venture capital firms	--12345	--12345	--12345
Firms (other sectors)	--12345	--12345	--12345

15.) Please name the three most important sectors you recruit from.
Indicate their importance form 1 (relative low) to 5 (relative high)
Sector 1:
Sector 2:
Sector 3:

16.) Please indicate in terms of percentage for the firm's success the relative importance of: (adding up to 100%)
a) Knowledge acquired inside the company
b) Knowledge acquired outside the company:

17.) What percentage of your firm's investments stem from direct approaches of the future portfolio companies themselves?

Part 2A: Knowledge exchange - Investment knowledge
This part of the interview deals with the exchange of investment / market knowledge,
e.g. knowledge concerning potential investments, new market developments, market trends, etc.

18.) Please name organizations your firm is in contact with and exchanges investment / market information that are relevant for your firm's performance ("Where to invest?").
These may be other venture capital firms, other firms, universities, research organizations, public agencies etc., and no matter whether these are local or non-local organizations.

19.) Could you express the importance of the following sources of information for gathering investment knowledge? Please indicate their relative importance from 1 (not important) to 5 (very important).
a) Fairs and exhibitions
b) Specialized magazines
c) Market surveys
d) Academic journals
e) Are there any other sources of investment knowledge that are not mentioned above?
Source 1:
Source 2:
Source 3:

Part 2B: Knowledge exchange - "Maintenance" knowledge
This part of the interview deals with the exchange of maintenance knowledge required for investing, managing, monitoring, and exiting portfolio firms.

20.) Please name organizations your firm is in contact with and exchanges maintenance information that are relevant for your firm's performance. These may be other venture capital firms, other firms, universities, research organizations, public agencies etc., and no matter whether these are local or non-local organizations.

Name:

Type of organization:
––VC firm; Investors in VC; Prior investments; Active investments; Other

If "Other", please specify:

Please indicate the location of the organization (municipality):
Please indicate how important this relation is for your firm's performance ––12345
(1 not important to 5 very important)

This relationship has been established by:	--Professional contact; Existing social contact; Meeting at local event; Meeting at non-local Event; Shared third-party contact Can't remember; Other
Other:	
Please mention in which sector this organization is mainly active.	
Please mention for this organization whether the investment knowledge in your firm is similar to that of this organization.	--12345

21.) Could you express the importance of the following sources of information for gathering maintenance knowledge? Please indicate their relative importance from 1 (not important) to 5 (very important).
a) Fairs and exhibitions
b) Specialized magazines
c) Market surveys
d) Academic journals
e) Are there any other sources of maintenance knowledge that are not mentioned above?
Source 1:
Source 2:
Source 3:

Part 3: Crisis and policy

The last part of the interview concerns your firms' awareness of the financial crisis and existing policy initiatives as well as their effects.

22.) Is the financial crisis negatively affecting your firm in:
a) Fundraising
b) Investment opportunities
c) Performance of portfolio firms
d) Other:

23.) Which of the following policy initiatives supporting venture capital have you used so far (at the regional, national, international level)?
1.)

24.) Please mention those policy initiatives that you have heard and made use of within the last 3 years?

1 Initiative:
Heard of / used:
Spatial level aimed at:
Please indicate in what way you have benefited (multiple answers possible) from each mentioned initiative.
i. Access to investment knowledge
ii. Access to maintenance knowledge
iii. Sharing of knowledge with potential investments
iv. Sharing of knowledge with investors (capital providers)
v. Sharing of knowledge with other VC firms
vi. Sharing of knowledge with universities / research institutes
vii. Sharing of facilities
vii. Human resource development (up skilling, training)
viii. Management knowledge
ix. Financial provisions
x. Other

25.) Why have you not received support of any of the named initiatives? (Multiple responses possible)

a) Project was turned down
b) Lack of information about support programs
c) Complicated structure of support system
d) Lack of time
e) Supporting instruments do not fit for the company
f) Other

26.) What support would your firm need? (Multiple responses possible)
a) Financial support (re-financing)
b) Education and training of employees
c) Information about potential investments
d) Information about investors (capital provider)
e) Consultancy
f) Help to find syndication partners
g) Other

Thank you for the interview.
If you would like to receive a copy of the final research report, please indicate here: ––No/Yes

Social proximity matrix

relation	working career	study & university	NVP membership	syndication frequency	total score	av. score
SYNDICATION						
VC001-VC003	0	1	0	0	1	
VC001-VC025	0	1	0	1	2	
VC001-VC028	0	0	0	0	0	
VC001-VC019	1	0	0	0	1	
VC001-VC004	0	0	0	0	0	
					4	0,8
KNOWLEDGE						
VC001-KP001					0	
VC001-KP002					0	
VC001-KP003					0	
VC001-KP004	1	0	0	0	1	
VC001-KP005	0	0	0	1	1	
VC001-VC025	0	1	0	1	2	
VC001-VC019	1	0	0	0	1	
					5	0,714285714
SYNDICATION						
VC009-VC024	1	1	0	0	2	
VC009-VC038	1	0	1	0	2	
VC009-VC037	0	0	1	0	1	
					5	1,666666667
KNOWLEDGE						
not specified					**1**	1
SYNDICATION						
VC007-VC049	0	0	0	0	0	
VC007-VC025	0	0	0	0	0	
					0	0
KNOWLEDGE						
none						
SYNDICATION						
VC047-VC033	0	1	1	0	2	
					2	2
KNOWLEDGE						
VC047-KP006	1	0	0	0	1	
VC047-KP007	1	0	0	0	1	
VC047-KP008	1	0	0	0	1	
VC047-KP009	0	0	0	0	0	
					3	0,75
SYNDICATION						
VC011-VC043	0	0	0	0	0	
VC011-VC033	0	0	0	0	0	
					0	0
KNOWLEDGE						
VC011-VC025	1	0	0	0	1	
VC011-KP010	1	0	0	0	1	
VC011-KP011	1	0	0	0	1	

VC011-KP012	1	0	0	0	1	
VC011-KP013	1	0	0	0	1	
					5	1
SYNDICATION						
VC032-VC010	0	0	0	1	1	
VC032-VC031	0	0	1	1	2	
					3	1,5
KNOWLEDGE						
VC032-VC031	0	0	1	1	2	
VC032-VC033	0	0	1	0	1	
VC032-KP014	0	1	0	0	1	
VC032-KP015	1	1	0	0	2	
VC032-KP016	0	0	0	0	0	
VC032-KP017	0	0	0	0	0	
					6	1
SYNDICATION						
VC043-VC011	0	0	0	0	0	
VC043-VC033	0	0	0	0	0	
					0	0
KNOWLEDGE						
VC043-KP018	0	0	0	0	0	
VC043-KP019	0	0	0	0	0	
					0	0
SYNDICATION						
VC006-VC027	0	1	0	0	1	
VC006-VC050	0	0	0	0	0	
VC006-VC037	0	0	0	0	0	
VC006-VC033	0	0	0	0	0	
					1	0,25
KNOWLEDGE						
VC006-VC014	0	1	0	0	1	
					1	1
SYNDICATION						
VC005-VC037	0	0	1	1	2	
VC005-VC056	0	0	0	0	0	
					2	1
KNOWLEDGE						
VC005-KP020	0	0	0	0	0	
VC005-KP021	0	0	0	0	0	
VC005-KP022	1	0	0	0	1	
VC005-VC056	0	0	0	0	0	
					1	0,25
SYNDICATION						
VC004-VC001	0	0	0	0	0	
					0	0
KNOWLEDGE						
none						
SYNDICATION						
VC045-VC037	0	0	0	0	0	
					0	0
KNOWLEDGE						
none						

Wilcoxon Signed Rank Test

Ranks

		N	Mean Rank	Sum of Ranks
Knowledge distance - Syndication distance	Negative Ranks	5[a]	4,20	21,00
	Positive Ranks	2[b]	3,50	7,00
	Ties	0[c]		
	Total	7		

a. Knowledge distance < Syndication distance

b. Knowledge distance > Syndication distance

c. Knowledge distance = Syndication distance

Test Statistics[b]

	Knowledge distance - Syndication distance
Z	-1,183[a]
Asymp. Sig. (2-tailed)	,237

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test