

Venture Capital syndicate networks in Germany – the determinants of the interconnectedness

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Abstract

This paper examines the German VC syndicate networks and to what extent certain characteristics of VC companies determine the investors' interconnectedness. The data used contains detailed information about 300 VC investments and their investors made in the years 2004 and 2005. The analysis shows that the age of the VC companies dichotomously influences the syndicate networks of the investors. In contrast, the fact of being privately held or under governmental influence does not affect the number of network ties of the VC firms. The analysis reveals no indication for any geographical or spatial influences on the number of syndication partners a VC company has within its network.

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1. Introduction

Academic research examining both the networks of VC companies built through syndicated venture capital (VC) investments and geographical and spatial influences on the VC markets is somewhat insufficient. Most of the studies either focus on the geographical aspects (see Fritsch and Schilder, 2006a for an overview) or on the syndication of VC investments (Manigart et al., 2006; Lerner, 1994; Lockett and Wright, 2001). Only few studies combine both lines of research, such as the study from Sorensen and Stuart (2001) and the work from Bygrave (1987, 1988). However, this research is limited to the US VC market which shows certain particularities such as large spatial distances. Furthermore, the characteristics of the key players within networks are not completely explored. Therefore, additional research on VC syndicate networks and the geographical and spatial influences is necessary.

This paper focuses on the interconnectedness of VC companies within syndicate networks. The more network ties a VC firm has in form of syndication partners, the higher is its centrality degree of the network and the larger is its own syndicate network. However, past research does not entirely explain in how far different characteristics of VC companies and, especially, geographical aspects influence the network position of a VC company - that is to what extent the VC firms are connected with other investors. The logical question raised in this context is: "What determines the number of ties to syndication partners of a VC company within a syndicate network?" In other words, the analysis of this study examines which characteristics of the VC firms influence their centrality degree within the network, measured by the number of different syndication partners each VC firm has. To answer this question, a dataset containing information about more than 300 VC investments made in Germany in the years 2004 and 2005 is used. The results of the analyses show which individual characteristics of VC investors, such as its age, its geographical location or its spatial investment behavior lead to a central position within a syndicate network, i.e. a large individual network of a VC firm. The findings also indicate the role of different

types of VC firms in the German VC market, e.g. by a comparison of privately held VC firms and VC companies that are under governmental influence.

The rest of the paper is structured as follows. The second section contains the rationale of VC syndication. Thereon, some assumptions regarding the influencing factors of the position of VC firms within a syndicate network are hypothesized, based on a literature review (Section 3). Then, the data is introduced and the syndicate network relationships in Germany are described (Section 4). Section 5 contains the empirical analysis with regard to the hypothesis of different determinants of the network position of VC companies. In the last section (Section 6) follows a conclusion and impacts for further research.

2. VC syndication

The VC business is not a lonesome activity of individual investors working on their own. In many cases VC investments are syndicated (Lerner, 1994). Syndication in this context means that more than one VC investor is involved in the investment (Wright and Lockett, 2003). Although, all participating VC firms are taking a stake in the investment, their function within the syndicate differs. The role of the financiers ranges between active lead investors, that do not only invest but also offer further services such as consulting, and more or less passive co-investors that merely give money and resign to provide additional services. Every VC company is incorporated in different syndicates with various syndication partners. Out of this cooperation grows a so-called syndicate network (Bygrave, 1988; Sorensen and Stuart, 2001). The more syndication partners in distinct syndicates a VC company has the larger is the specific syndication network of the individual VC firm.

The syndication of VC investments has various reasons. Each phase of a VC investment i.e. the search for possible target companies, the act of investing itself, the monitoring and consulting of the portfolio firm during the investment and the exit of the investment (Gompers and Lerner, 2001), has its own characteristics.

Hence, different reasons or rationales for syndication emerge of the phases of a VC investment (Sorensen and Stuart, 2001). In the pre-investment phase, syndication, or more precisely the possible syndication of investments, might help to find and to evaluate target companies (Manigart et al., 2006; Lockett and Wright, 2001). If one VC company detects a possible investment, it might ask other VC companies to syndicate. For these VC firms, the invitation to the syndicate eases the search for investments, i.e. the so-called deal flow.

For the second phase of an investment, the investment decision, syndication might be helpful or even necessary, too. First, one investor might not be able or willing to raise enough capital for the investment itself (DeClerq and Dimov, 2004, Brander et al., 2002). The VC company needs help from other investors. Second, it is an advantage to share the investment, even though the investor is able to stem the investment alone. Possible reasons are risk reduction through portfolio diversification for the individual VC company and a combined evaluation of the investment (Lockett and Wright, 1999, 2001; Cumming, 2006). The due diligence done by different VC companies might be more valuable than that of a single investor (Lerner, 1994).

Once the investment is made, syndication is also advantageously for the participating investors (Brander et al., 2002). These benefits apply to the additional services that VC companies provide to their portfolio firms, such as monitoring, advising and consulting. Through syndication the costs of these activities can be shared, whereby the resources of the individual investor are saved (Schilder and Fritsch, 2006). Furthermore, the syndication partners can combine their resources (DeClerq and Dimov, 2004). This is especially important if one syndication partner is located close to the investment and the other investors are far away from the portfolio firm (Fritsch and Schilder, 2007,b; Sorensen and Stuart, 2001). In this case, the VC company that is located closest to the investment can do most of the monitoring and advising activities at site of the portfolio company. The distant located syndication partners benefit from this proximity, e.g. through lower costs of traveling (Fritsch and Schilder, 2007).

Even if the VC investment comes close to an end or is even already exited syndication might be helpful for the VC companies. One possible example is the exit through a trade sale, which is a sale of the venture's shares to an industrial company. This is one of the most important ways of exiting a VC investment in Germany (German Private Equity and Venture Capital Association, 2005). Trade sales might be easier if more than one investor is involved. The different financiers have contact to different possible buyers for the stakes of an investment. Therefore, the search for a trade sale partner is eased. After an exit, the fact that an investment has been syndicated can still be valuable. The participating investors might remember their syndication partners when they search for co-investors in the future, at least if the syndicate was successful (Manigart et al., 2006; Sorensen and Stuart, 2001). Again, this allows an easier deal flow for the VC company. Herewith, the cycle of VC investments is closed and, obviously, also the cycle of the associated role of syndication.

3. Syndicate networks and the characteristics of the key players

The reasoning for syndication gives first evidence for the role of syndicate networks. A syndicate network is composed of a number of VC companies that are in relationship to each other through joint investments (Bygrave, 1988; Sorensen and Stuart, 2001). Starting from one specific VC company, its syndicate network partners are all investors that are involved in any of the VC company's investment syndicates. As each individual network partner of the VC company is also interconnected with other investors through syndicates, there exists an overall VC syndicate network for the whole or nearly the whole market for example in one country. Past research on VC syndicate networks and spatial determinants focused on the reasoning for syndication and for syndicate networks (Bygrave, 1987 1988) or on the impact of syndicate networks on the spatial investment behavior of VC firms (Sorensen and Stuart, 2001). However, these studies show two main restrictions. First, they are limited to the US VC market that is said to be rather unique, for example in regard to its development (Martin et al., 2002), its

investment activity (Sapienza et al., 1996) or its geographical structure (Martin et al., 2002). Second, they do not entirely explore which determinants turn VC investors into active network players.

The role of different actors within a syndicate network is important for VC companies. According to network analysis theory, the more ties a financier has to other VC firms through syndication, which corresponds to its individual co-investment network, the more central is its position within the network (Wassermann and Faust, 1994, 178) and the more it can benefit from the network (Bygrave, 1988). First, a large network of co-investors eases the search for further investments, because the co-investors might invite the VC company to participate in deals that they have not heard of (Bygrave, 1987; Manigart et al., 2006). Second, a set of many co-investors helps to find a syndication partner for various kinds of future investments. A suitable co-investor might enable the VC company to enlarge the provided services for the portfolio company (Brander et al., 2002), to ensure a sufficient capital availability for large investments (Lerner, 1994) and to overcome the problems attached to investments that are located far away from the VC company (Fritsch and Schilder, 2006 a,b). For these reasons, it is important to understand what determines a well interconnected network position of VC firms.

One important characteristic of a VC company with regard to its position within the syndicate network is the VC firm's age (Sorensen and Stuart, 2001). First, the older the VC company is the more experienced is its management (Gompers, 1996). The experienced investment managers might have many different contacts, personal as well as through work experience. Out of these contacts the co-investment and syndication of VC deals can emerge (Sorensen and Stuart, 2001). Second, older VC companies have a longer history of past VC syndicates than young VC firms. These co-investments might help to find syndication partners or to be invited to syndicates. The trust established during a past syndication is an important advantage with regard to future deals (Wright and Lockett, 2003). If the earlier joint investment was successful, this cohesion might even be stronger. Finally, a good and sustainable track record strengthens the

reputation of the VC firm and encourages other VC companies to participate with the successful VC company in the same syndicate (Lockett and Wright, 1999). A young VC firm does not have this track record and might also have a less experienced management than older VC firms (Sorensen Stuart, 2002). Therefore, it can be assumed that older VC firms have a central position within the syndicate network and show more different co-investment ties than younger VC investors.

The second possible determinant of the VC firm's network position is a spatial argument. The larger the individual network of the VC company is, that is the higher its degree of centrality is within the overall network, the more likely the investor will have investments that are located far away from its own location (Sorensen and Stuart, 2001). There are two main reasons for this correlation. First, to find and to evaluate suitable investment opportunities becomes more difficult with raising spatial distance (Manigart et al., 2006; Lockett and Wright, 2001). Making use of a large syndicate network can ease the search and evaluation of target companies. Second, syndication might be used to overcome the problems of investments that are located far away from the investor such as long traveling distances for monitoring and consulting of the portfolio firm (Fritsch and Schilder, 2006b). If one syndication partner is located close to the investment, it can undertake these services that need to be done at site of the financed venture, such as certain monitoring and consulting activities. The other syndication partners can be located farther away and do not have to be at the investment very often. Therefore, many relationships to different syndication partners might help to find, evaluate, and manage distantly located investments. In other words, a large spatial investment behavior of VC firms requires and entails many network ties to other VC investors.

Third, the interconnectedness of syndicate networks might be influenced by the geographical dispersion of the VC suppliers. Although the German VC market is less spatially clustered than for example the US market (Powell et al., 2002; Florida et al., 1991), it has several VC centers such as Munich, Frankfurt/Main, Duesseldorf, Hamburg, Berlin and the Rhine-Ruhr area (Fritsch and Schilder, 2007; Martin et al., 2002). VC companies that are located in these core centers

might have a more central position within the overall VC syndicate network (Sorensen and Stuart, 2001). The spatial proximity to many other VC firms might spur their personal contacts within the VC community which, in turn, might ease the contacts to possible syndication partners. In return, these VC companies that are located in a peripheral region might have a disadvantage with regard to their contacts to other investors and, therefore, their syndicate network. Thus, being located in one of the German VC centers might lead to a better connected position of a VC company within a syndicate network than that of investors in peripheral regions.

Finally, the background of the VC company, in this context, public means that an investor is under governmental influence or privately held, might have an impact on its number of co-investors and its personal syndicate network. Many public VC companies – these investors are either set up by public authorities or under their influence - are restricted in regard to their investments to a certain region (Doran and Bannock, 2000; Sunley et al., 2005). Their main goal is to ensure a sufficient supply of capital for entrepreneurship and innovative activity in this specific area (Schilder, 2006; McGlue, 2002). Therefore, they have to work as a lodestone attracting capital from outside their resident region and multiplying their own supply of capital through syndication. Furthermore, the private syndication partners can strongly benefit from the public VC companies' access to local networks (Sunley et al., 2005), which might be advantageous for their deal flow and for the evaluation of the target company. Therefore, a public VC investor as syndication partner should be an interesting co-investor for private VC suppliers. For that reason, public VC firms might have more co-investments than their private counterparts, which is equal to a more central position within the overall syndicate network.

4. Analysis

4.1 Dataset

The analysis is based on a set of data containing details about German VC investments at the micro-level. The data are provided by *VC facts*, a company which collects information about VC investments in Germany. It comprises information about 134 and 174 VC investments for the years 2004 and 2005, respectively. This equals nearly half of the early stage investments that are recorded by the German Private Equity and Venture Capital Association (2005). Furthermore, there is a clear investment focus in certain industries. More than 36 percent of the investments are in the biotechnology industry, followed by investments in software related businesses (14 percent). Around six percent of the financed start-ups are active in the communication business as well as in medical technologies. This is similar to the industry focus of the investments made by the members of the German Private Equity and Venture Capital Association (2005). One quarter of the investors in the analysis is under public influence, the rest is privately held. Thus, only slightly more than one half of the VC companies under investigation are located in the German VC centers which is less than for the overall market (Fritsch and Schilder, 2007). However, it still can be assumed that this sample is representative for the overall VC activity in Germany during the time period under investigation. For the purpose of this paper, the focus is on detailed information about the age and location of the VC investors, their syndicate network and their spatial investment behavior. Based on the addresses of the VC firms and the investments, the average traveling distances between an investor and a portfolio company and between the co-investors within a syndicate was calculated. Therefore the internet-based route planner *map24.de* was used.

199 of the 308 VC investments in the sample are syndicated, i.e., there is more than one investor involved. Hence, 825 pairs of investor and the respective portfolio company can be identified. Furthermore, the number of pairs of investors that are involved in n investments can be counted: $(n-1)/2$. For example, if a venture has two investors there exist one pair of co-investors. Within a

syndicate of three investors *three* pairs of co-investors emerge. The data contains 2107 pairs of co-investors that are involved within syndicates. Due to many missing values most of the analysis is only based on considerable less observations. The missing information mainly concerns the age of some VC companies and the addresses of informal VC investors and of foreign investors. These investors are excluded from the following analysis. Furthermore, the data does not contain information about passive governmental co-investors, such as the Kreditanstalt fuer Wiederaufbau (KfW). Due to their merely passive syndication behavior without providing any additional services these investors might not influence the effects of VC syndicate networks that underlie this investigation.

Table 1 shows descriptive statistics for the main characteristics of the sample. All figures refer to the point in time when the investment was made. On average, the financed companies were almost five years old whereas the VC companies already existed since more than ten years. The average amount invested per financed company and per investment amounts to slightly more than eight million Euros. Almost two thirds of the investments are syndicated. On average, the number of investors for the syndicated investments is about 4.2. The average number of syndication ties per VC company is 9.65. However, this number does not show the network of the individual VC company in detail. If a VC company has two syndicates with the same syndication partner the syndicates are counted as two ties. Such a tie between the two is stronger than that of a single syndicate (Bygrave, 1987). Therefore, the network of different syndication partners of a single VC company is smaller than the total number of syndication ties. On average, the syndicate network of an individual VC company contains about eight different syndication partners. This relatively small difference between the overall number of ties of a VC company and the number of different co-investors of this financier might be due to the two-year period of the data. Serial investments that are based on experiences of past syndicates are not very likely within such a short period of time.

Table 1: Descriptive statistics

	Mean	Median	Minimum	Maximum	Standard deviation
Age of portfolio company (years)	4.84	4.00	0.00	36.00	3.84
Age of VC company (years)	10.43	7.00	0.00	57.94	10.12
Overall amount of capital invested (million €)	8.21	5.00	0.15	35.00	8.65
Average distance to investment (per portfolio in km)	271.81	228.74	0.00	868.61	225.50
Number of investors per investment	4.17	3.00	1.00	12.00	2.59
Number of syndication ties (per VC company)	9.65	5.00	1.00	92.00	13.14
Number of different syndication partners (per VC company)	8.08	5.00	1.00	65.00	9.94

4.2 What do VC syndicate networks look like?

The syndicate network's size of the individual VC company can either be described by its overall number of ties to co-investors the VC firms, which indicates the frequency of network contacts, or by its number of different co-investors one VC company, that shows the breadth of the network (Bygrave, 1987). In this analysis, the syndicate networks are limited to number of different co-investors of each VC company due to two reasons. First, both variables are statistically significantly correlated with a correlation coefficient around 0.98. Therefore, the results do not differ considerably and both variables seem to act as good proxies for each other. Second, some advantages of come from large networks, such as the sharing of information (Bygrave, 1988), and heavily depend on the number of different syndication partners. The strength of the ties between

two VC investors might not be as important for these network benefits. If a VC company has ten syndicates only with the same co-investor it still has the smallest possible network of one other financier. Therefore, the number of different co-investors is a more appropriate indicator for the network of a VC company (Bygrave, 1987).

The overall syndicate network grows out of the individual networks of the single VC companies, the so-called ego-network (Wassermann and Faust; 1994, 42).). Through joint investments the VC companies are interconnected and, therefore, also their networks. However, some VC firms that either do not have syndicated investments or whose networks are isolated from other networks are not part of the main component of a VC syndicate network. Figure 1 depicts such a main component for the German VC market. It is the largest interconnected syndicate network and contains more than two thirds of all VC firms in the sample used. The network only shows German VC investors and their ties to other German VC companies. Although, the ties to foreign investors are excluded, whereby the global network could be illustrated, at least, the overall German syndicate network is indicated. Furthermore, more than 50 percent of the German VC investments are made solely with German syndication partners (German Private Equity and Venture Capital Association, 2006). Therefore, the exclusive German syndicate network is an important characteristic of the market with regard to domestic VC investment activity.

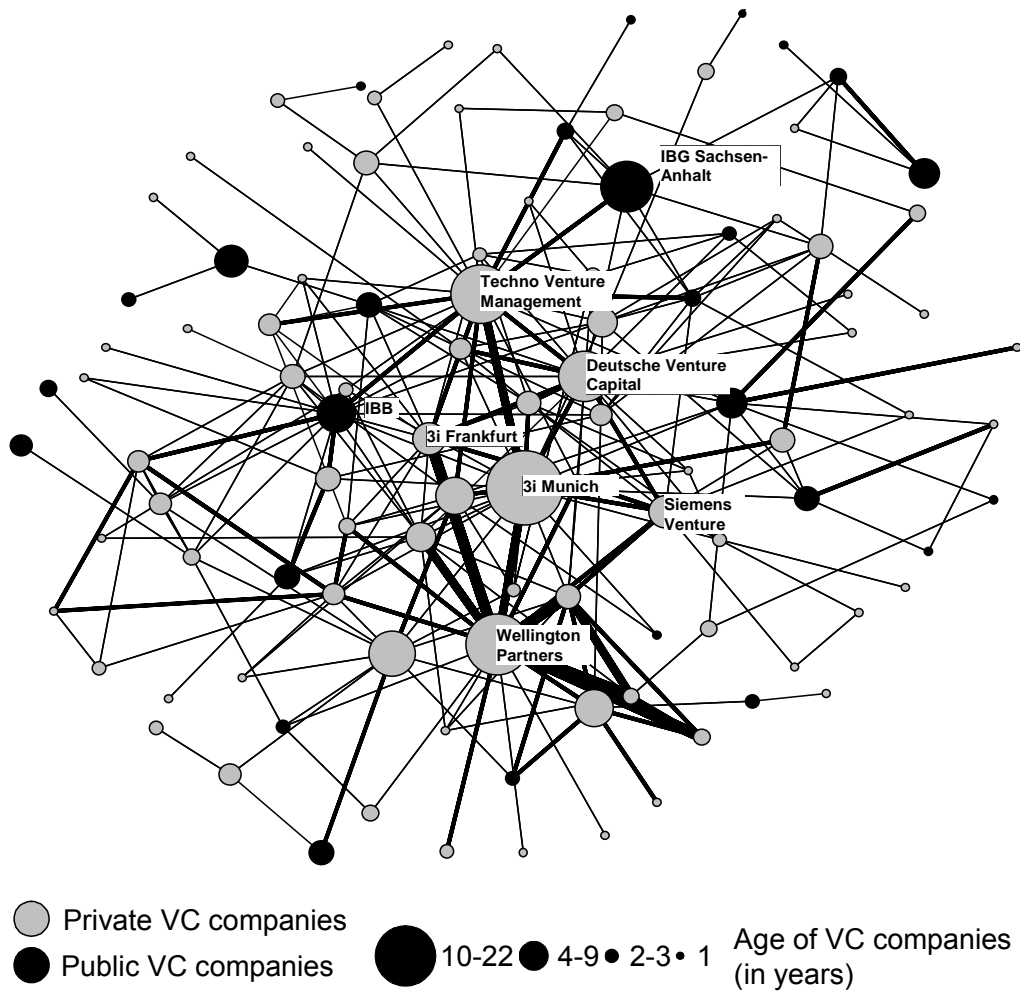


Figure 1: Main component of the German VC syndicate network

Each circle in the network, that is a node of the network, represents one VC firm. The size of the node stands for the age of the investor; the older the VC company is the larger is the circle. The different colors indicate whether the VC company is private or public; grey circles stand for privately held investors and black circles for VC firms that are under governmental influence. The ties between the financiers represent the cooperation within one or more syndicates and are shown by the black lines. The thicker the line is the more joint syndicates these two VC companies have. This equals a stronger network tie between the two investors. The more lines emerge from a VC firm, the more network ties with different other financiers it has. Many lines coming out of a node mean that this VC company has a central position within the overall network, because the number of ties is the simplest measure of an actor-level degree centrality

(Wassermann and Faust; 1994, 178). Overall, the network indicates that the VC market is very well interconnected via syndicates. However, it also shows that some VC firms are more or less key network players that have many different ties and keep the large network together. These are mostly older firms such as the VC subsidiary of Siemens, 3i in Frankfurt and Munich or Techno Venture Management. Most of these key players are privately held and only few VC suppliers that are mainly influenced by public authorities are also well interconnected in the network. Among these are for example the VC subsidiary of the Merchant and Development Bank Berlin (*IBB*) and the *IBG Beteiligungsgesellschaft Sachsen-Anhalt mbH*.

The main component of the VC syndicate network shows a strong interconnection of the German VC market. Many of the investors have syndication ties with other VC firms and, in most cases with more than one co-investor. Furthermore, there are some key players within the network that ensure such a large main component. They seem to be rather old and privately held. However, the visual interpretation of figure 1 still leaves one main question: which determinants turn VC companies into key players of the network? In other words, we still have to search for these characteristics that help a single VC firm to build up many different syndication ties.

4.3 What determines the degree centrality of VC firms in the syndicate network?

The possible determinants of the size of the VC companies' syndicate networks measured by the number of different syndication partners per VC firm, are explored in the following in-depth analysis. A negative binomial regression is employed. The dependent variable is the number of different syndication partners each VC investor has. The independent variables depict the determinants of the interconnectedness or centrality degree of the VC companies (see Section 3). First, the age of the VC company is used, because older VC firms might have larger networks. Second, a dummy variable that shows whether the VC firm is privately held or under governmental influence (public dummy) is used to show the differences between both types of financiers. Third, two variables are added to

the model to explore the influence of geographical and spatial aspects on VC syndicate networks. The analysis is based on network information about 128 German VC firms and their syndication ties that are part of the dataset introduced above. Private individuals and foreign VC companies are excluded from the analysis. Furthermore, the data lack of information about the age of several investors. Therefore, they are also not part of the estimations.

The results clearly show that the age of the VC company firm has a statistically significantly positive influence on its number of different co-investors (Table 2, Model I). However, by adding the variable age^2 , that is the square of the age of the VC firm, we can see that this influence becomes smaller over time and, finally, is negative (Model II). That means that the benefits of being older, for example the experience and the track record of the VC firm, are only important in a certain age. Very young companies and very old companies can not benefit from these advantages. One, considerably only assumed reason for the dichotomous influence of the age might be that older VC firms begin to rest on their laurels.

The institutional background of the VC company, that is whether the VC suppliers are privately held or under governmental influence, does not affect the degree of centrality within VC syndicate networks. The estimations do not show any statistically significant difference between both types of VC companies. Therefore, public VC companies seem to be equally interconnected and established within the German VC network which might be rather astonishing in regard to the visual analysis of the VC network (figure 1). However, they do not make more extensive use of syndication than their privately held counterparts to enlarge for example the VC supply for their resident region. Unfortunately, the data does not provide information about the overall number of portfolio companies per investor, the amount a VC firms has under management or the number of investment managers per financier. Therefore, it is not possible to control for differences regarding the size of the VC companies, which might also influence the network activity of the investors (Bygrave, 1987).

Table 2: Determinants of the number of syndication ties per VC company
(negative binomial regression)

	Number of different co-investors (per VC company)			
	I	II	III	IV
Age (VC company)	0.031* (2.43)	0.144** (5.25)	0.146** (5.26)	0.146** (5.22)
Age ² (VC company)	-	-0.003** (4.87)	-0.003** (4.88)	-0.003** (4.77)
Public VC company (dummy)	-0.181 (0.87)	-0.226 (1.15)	-0.265 (1.22)	-0.257 (1.10)
Location in VC centre (dummy)	-	-	-0.090 (0.42)	-0.082 (0.42)
Average distance to investment (per portfolio in km)	-	-	-	0.000 (0.08)
Constant	1.711** (10.24)	1.030** (4.94)	1.090** (4.49)	1.066** (3.64)
Pseudo R ²	0.001	0.034	0.035	0.035

** Statistically significant at the 1%-level; * Statistically significant at the 5%-level;
Number of observations: 128

The geographical and spatial influences on the number of network ties of a single VC company are less pronounced than assumed. First, the location of a VC company in one of the German VC centers does not statistically significantly affect its syndicate network. Both VC firms in the centers or in peripheral regions seem to have a similar degree of centrality in the syndicate network (Model III). This might be due to the composition of the data that shows a relatively high share of VC companies in peripheral regions. Second, the spatial investment behavior, measured by the average distance between a VC company and its portfolio firms, has no statistically significant influence on the number of ties of a VC company (Model IV). In contrast to the findings from a US study made by Sorensen and Stuart (2001) the network position of a VC investor and its spatial investment behavior are not related in Germany. This might come from a pronounced unimportance of spatial aspects for the German VC market (Fritsch and Schilder, 2007). Furthermore, other variables such as the spatial dimension of the syndicate network, indicated by the average distance between the investor and its

syndication partners or the geographical location of the investments, do not have a statistically significant influence on the network position of VC company. These results are not reported in the estimation tables. Overall, the estimations on geographical and spatial influences of the VC investors' network position show that these determinants are less important than for example for the large and geographical more dispersed US VC market (Sorensen and Stuart, 2001).

5. Conclusions and implications

VC companies are interconnected through a network of joint investments, so-called syndicates. In this paper the VC syndicate network activity in Germany is explored. Furthermore, possible determinants of the role of certain VC companies within the network are analyzed. That means, this study shows to what extent certain characteristics of investors influence their individual or ego network of syndication partners, which equals their degree of interconnection or centrality within the overall network. The empirical analysis is based on a unique dataset containing information about more than 300 VC investments made in German during the years 2004 and 2005.

The analyses reveal that the German VC market is closely interconnected. The main component of the network shows that more than two thirds of the VC firms within the used data are connected through syndicates. Furthermore, the visual and descriptive analysis gives evidence that some VC firms have considerably more relationships to syndication partners than others. Therefore, a regression analysis is employed to explore the influence of several possible determinants of the network position of VC firms. The number of different co-investors per VC company, that is an indicator for the centrality degree of the network position of VC firms, mainly depends on the VC companies' age. Older VC investors seem to profit from advantages through more experiences or a longer track record of investments than young VC companies. However, this effect diminishes over time and even turns into a negative influence. Other

characteristics of the VC firm, such as the fact whether they are privately held or under governmental influence, do not show a statistically significant influence on the network position of the investor. Furthermore, the results indicate that the German VC syndicate network is not influenced by geographical or spatial aspects. Neither the location of the VC firms – that means a location either in one of the German VC centers or in a peripheral region - nor their spatial investment behavior affects their number of different syndication partners.

The results of this study raise some questions that should be evaluated in further research. First, the network analysis should be enhanced by additional types of closeness than mere spatial proximity, such as social, industrial or organizational proximity, and their role for the networks of the individual VC companies. Second, the influence of VC networking on the success of the investments is an interesting topic for further research (Hochberg et al., 2007). Finally, syndication is only one peculiarity of VC networking. Although, this might be the most difficult and challenging task, further network contacts, for example on an informal basis should be analyzed.

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