



# Importance of spatial proximity between venture capital investors and investees in Germany

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## ABSTRACT

Based on 1182 dyads of venture capitalists and German portfolio companies involved in a financing round between 2002 and 2007, the study here examines the importance of spatial proximity between investors and investees in a dense economy. Analysis of this data shows that the probability of a financing relationship decreases by 8% if the journey time increases by one standard deviation. For deals involving very small or very large investment sums, and for less experienced venture capitalists and lead investors, spatial proximity is particularly important. The results suggest that even in economies with a dense infrastructure such as Germany spatial proximity between investor and investee impacts the likelihood of an investment.

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## 1. Introduction

Venture capital as external equity financing for young, high potential companies can play a vital role in elevating venture growth in that it provides not only financial support but also managerial advice as well as access to networks (Bottazzi, Da Rin, & Hellmann, 2008; Hellmann & Puri, 2000) and, thereby, creates economic growth (Chen, 2009; Kortum & Lerner, 2000). Due to this critical role, researchers as well as policy makers have been interested in understanding factors that foster easier access to venture capital (Florida & Kenney, 1988; Mason & Harrison, 1992). Descriptive empirical evidence confirms the existence of dense clusters of venture capitalists and venture capital investments in areas within the US and in Europe (e.g. Florida & Kenney, 1988; Martin, Berndt, Klagge, & Sunley, 2005; Martin, Sunley, & Turner, 2002; Mason & Harrison, 2002; Patton & Kenney, 2005). As the entrepreneurial ecosystem and the venture capital environment cross-fertilize each other, the importance of spatial proximity could imply an increase in the clustering of young companies and venture capitalists and possibly hindering economic growth outside of these clusters.

Prior studies include analyzing the relationship between the distance and different characteristics of the investee and the investor. However, these studies mainly differentiate between close and distant investments in widely dispersed economies such as the US or

Canada. Venture capital deals within a region often involve young companies and ventures in a high-tech industry (Powell, Koput, Bowie, & Smith-Doerr, 2002). Empirical evidence exists on the relationship between the local bias of venture capitalists and the characteristics of their investments. Venture capitalists with a more established reputation and a broader network are found to exhibit less of this local bias (Cumming & Dai, 2010a). Early stage and government-backed venture capitalists prefer a more narrow geographic scope (Gupta & Sapienza, 1992) whereas larger and later stage venture capitalists more often indicate that they would also invest across a broader geographic reach (Hall & Tu, 2003).

In the US, spatial distance has a negative impact on the likelihood of a venture capital investment. The effect is less pronounced for venture capitalists with a well-established network and for syndicated deals (Sorenson & Stuart, 2001). Sorenson and Stuart (2001) reveal the impact of long distances by comparing potential investments on the east and west coast. European countries differ substantially from the US as they are spatially much more concentrated and have denser infrastructures. Hence, the mean air distance between venture capitalists and their portfolio companies is significantly smaller and whether or not the results on the importance of spatial proximity also hold true for smaller distances is questionable. Germany, in particular, is an interesting market to analyze the importance of spatial proximity for smaller distances because no single city or region dominates the venture capital market.

The importance of spatial proximity is less pronounced within denser economies such as Germany. Controlling for potential venture capital demand, Engel (2004) found no relationship between the

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number of venture capitalists within a district and the number of venture capital investments made within that district. [Fritsch and Schilder \(2007\)](#) indicate, based on expert interviews, that dense infrastructure and a limited number of investment opportunities make distance relatively unimportant for German venture capitalists. Furthermore, syndication is used as an instrument for overcoming any disadvantages of longer distances between them and potential portfolio companies ([Fritsch & Schilder, 2008, 2012](#)).

This study aims to shed further light on the relevance of spatial proximity of investments to the investment decisions of German venture capitalists. Based on 1182 dyads of venture capitalists and German portfolio companies involved in a financing round between 2002 and 2007, this study analyzes the impact of geographic distance on the likelihood that a deal be closed. The minimum journey time between venture capitalist and portfolio company was used as a metric for spatial proximity taking into account the particularly dense travel infrastructure in Germany. In addition, it was tested whether deal size, the experience of the venture capitalist or syndication influences the importance of spatial proximity.

By demonstrating that even in dense infrastructures the journey time between the venture capitalist and the potential portfolio company positively influences the likelihood of an investment, this study contributes to the existing research on spatial proximity in venture capital finance. The likelihood of an investment decreases by 8% if the minimum journey time increases by one standard deviation. Furthermore, factors influencing the causal relationship between spatial proximity and the probability of raising venture capital are shown. A non-linear relationship between the deal size and the importance of spatial proximity is found. Short journey times between venture capitalists and potential investments are particularly important for ventures seeking very small or very large investment sums. Furthermore, the relationship between spatial proximity and the likelihood of financing is particularly strong in deals involving less experienced venture capitalists and also for deals involving one lead investor. In addition, spatial proximity is less important for venture capitalists in syndicates, due to the potential of syndicates having one (even minor) syndicate member located relatively closer to the potential portfolio company.

The results of this study have implications both for theory and practice. They reveal that even in economies with a dense infrastructure and with fewer investment opportunities than in mature venture capital markets, shorter journey times between the investee and the investor significantly increase the likelihood of an investment. Therefore, regional equity gaps may exist and these results could serve to inform both entrepreneurs in their decision whether to locate closer to a venture capital cluster, as well as policy makers attempting to provide easier access to venture capital for high growth ventures.

The paper is organized as follows. The first part of [Section 2](#) provides the theoretical arguments regarding the effect of spatial proximity on the likelihood of a venture capital investment being made in dense economies such as Germany. The second part of [Section 2](#) derives predictions on factors which moderate the importance of spatial proximity, such as deal size, experience of the venture capitalist and syndication. [Section 3](#) describes the data, the measures and the methodology used in the empirical analysis. [Section 4](#) presents the results and [Section 5](#) summarizes the conclusions.

## 2. Theoretical background and hypotheses

### 2.1. Impact of journey time on the likelihood of investment

The relationship between venture capitalists and portfolio companies is often seen in the light of agency theory (e.g. [Lerner, 1995](#); [Sapienza & De Clercq, 2000](#); [Sapienza & Gupta, 1994](#); [Wright & Robbie, 1998](#)). The venture capitalist is portrayed as principal investing in a venture and leaving its management to the entrepreneur as agent.

Due to informational asymmetries and conflicts of interest between the two parties, agency costs emerge ([Jensen & Meckling, 1976](#)). Different mechanisms of monitoring and bonding can be applied to mitigate agency problems ([Gompers, 1995](#); [Kaplan & Strömberg, 2001](#)). The venture capitalist evaluates the uncertainty related to the investment based on different investment criteria such as the characteristics of the entrepreneur, the product, the market and the financial situation of the venture ([Kollmann & Kuckertz, 2010](#)). Furthermore, monitoring includes measures of control applied post-investment by the venture capitalist, e.g. through a seat on the board of directors, special control and voting rights or reporting obligations ([Gompers, 1995](#); [Kaplan & Strömberg, 2001](#)). However, in the case of short journey times, deal screening, due diligence and monitoring become easier and cheaper as it is less expensive and time-consuming transit-wise, less complicated to organize personal contacts and less difficult to obtain reliable information.

The investment decision of venture capitalists can be explained based on the transaction cost theory by [Williamson \(1981\)](#). Limited analytical and information processing capabilities on the part of contracting parties are assumed which leads to bounded rationality. The sum of transaction costs can then be used to evaluate alternative transactions ([Williamson, 1981](#)). Inherent transaction costs of a venture capital deal are information costs, negotiation costs and monitoring costs ([Benston & Smith, 1976](#)). Due to travel expenses and time, these transaction costs increase with increasing journey time. Furthermore, as social networks tend to be regional ([Blau, 1977](#)) information costs as well as monitoring costs are likely to increase with increasing journey time due to decreasing familiarity with regional particularities, markets or service providers.

Overall, it can be concluded that with increasing journey time, both agency and transaction costs are going to increase and, therefore, the likelihood of the venture capital investment should decrease. Empirical evidence for widely dispersed economies such as the US offers support for this line of argument ([Sorenson & Stuart, 2001](#)). However, the results refer to a comparison of the large scale differences in spatial proximity based on air miles. These results therefore may not necessarily be applied to denser economies with smaller scale differences in spatial proximity between investment targets. Germany offers an interesting context for analysis because it has a dense travel infrastructure and it is relatively easy to reach even remote areas within less than half a day of travel. Furthermore, venture capitalists and their portfolio companies tend to be clustered around major German cities such as Munich, Frankfurt, Berlin, Hamburg or Düsseldorf which offer convenient travel links (see [Fig. 1](#)). Therefore, additional agency costs and transaction costs due to travel expenses could potentially be less important in the investment decisions of venture capitalists in Germany. Indeed, [Fritsch and Schilder \(2007\)](#) purport in an interview-based study that German venture capitalists do not perceive the location of a venture to be important in their decision to invest. However, it is unclear whether this perception is borne out in the actual investment behavior of venture capitalists. It should be expected that even though agency and transaction costs induced by longer journey times are relatively lower in smaller, denser economies than in widely dispersed ones, they should still have an influence on the likelihood of an investment even in dense economies such as Germany. The selection of investments as well as the ongoing monitoring and support of ventures are expected to be easier if the journey time by car between the investor and the investee is only 20 min compared to half a day of travel.

In addition to agency and transaction cost arguments, social exchange theory arguments can also support the importance of spatial proximity. Stable social relationships develop in an evolutionary process during which the parties interactively increase their mutual commitment ([Larson & Starr, 1993](#)). These interactions are often not based on contractual arrangements, but depend on factors such as trust, reciprocity and reputation ([Blau, 1964](#)). Social relationships

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