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## The Influence of Functional and Relational Proximities on Business Angel Investments

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# The Influence of Functional and Relational Proximities on Business Angel Investments

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**Business angels are a vital source of capital for innovative startup firms. However, even of those startups that have the potential to fulfill angel investors' expected return on investment, most are rejected during the angel's investment decision process. Information asymmetry, risk and distrust in the relationship between the investor and the entrepreneur result in investment barriers. The concept of proximity has been proposed as a suitable conceptual foundation to understand how the relationship between angel and entrepreneur might hinder or benefit the investment decision. Particularly, researchers distinguish between functional (geographical) and relational dimensions of proximity. The purpose of this paper is to examine the influence of proximity on business angel investments. We do this based on data from 226 investment situations gathered in fall 2014 from 56 business angels and 87 entrepreneurs in Sweden and analyzed using a state-of-the-art Structural Equation Modelling technique. We find that the investment decision is partially determined by the functional proximity of investor and entrepreneur, when observed in isolation. Our results furthermore support conceptual studies in the field of business angels that have hypothesized a mediating effect of relational proximity in this relationship. Based on the empirical analysis in this study, we find this effect to be fully mediating.**

**JEL codes:** D81, M13, M21, O16, R12

## **Keywords**

Business angels, investment decision, functional proximity, relational proximity, structural equation modeling, mediation

## **1. The Role of Geography in Economic Interaction**

The role of geographical proximity in economic interaction has been widely debated in the academic literature over the past years [e.g. 1–5]. While the academic thinking on the intersection of geography and economic activity dates back to at least the late 19<sup>th</sup> century and the seminal works of Marshall on principles behind industrial agglomerations [6], the recent upswing in the scholarly interest has been fuelled by on the one hand the movement towards globalized economy, where distance is considered to be a factor of diminishing importance, and on the other hand the increased appreciation for the social aspects of economic interaction [7,8], which on the contrary emphasizes the importance of proximity. Also in practice, we have seen a rapid development of for instance virtual communities, electronic platforms for trade

and match-making and online learning solutions, which indicates that individuals and organizations in fact manage to interact rather successfully and productively with others over geographical boundaries. Taken together, this suggests that the role of proximity in economic interaction is indeed a relevant topic for both theory and practice, while the relationship between them and the mechanisms behind this relationship are far from well-understood.

A rather interesting theoretical development has occurred within the field of innovation studies, where researchers have suggested that we can evolve our understanding of how proximity plays in individuals' and organizations' decisions to interact, if we dig deeper into the notion of proximity itself. Specifically, researchers increasingly call for abandoning a plain, overly simplistic perception of proximity merely as physical space, and adopting a more complex, thorough understanding of proximity as incorporating both functional (geographical) and relational dimensions [2,8,9]. In this paper we draw upon this functional-relational proximity framework to study business angel investments.

## **2. Start-ups and access to finance**

The economic and societal importance of young innovative growth-oriented ventures, or *start-ups* [10], has been widely acknowledged in the scholarly and policy debate. Even though researchers do disagree on how (and whether) the total effect can be measured, the contribution of start-ups to the economy can be identified on several levels. At the firm level, new firms have shown to be more likely to grow and create new jobs than established firms. At the regional level, dynamic entrepreneurial population, expressed as high level of entries and exits of firms, seems to positively impact the regional growth. On the industry level, young innovative ventures, especially knowledge-based ones, are believed to contribute to renewal and technological development [see 11 for a comprehensive literature review].

Given this, finding ways to promote entrepreneurial activity has become a major policy objective in many countries, and specifically we have seen an increased interest in facilitating access to venture finance [10]. While being a rather minor obstacle for the SME sector as a whole, inadequate access to finance has been found to significantly hinder start-ups and early growth businesses, especially those that are technology-based [12–15]. Lack of tangible assets, high risk and information asymmetry are some of the reasons for why this type of firms experience difficulties in attracting external finance.

In this paper, we have chosen to focus on a specific, arguably one of the most significant, sources of venture finance – business angels, i.e. private individuals that invest their own money directly in young unquoted ventures that they don't have a family connection to.

As argued by Avdeitchikova and Landström [16], business angels are important for several reasons. Particularly, they:

- provide at least as much financial capital to firms as formal venture capital investors and finance manifold more ventures,
- primarily provide small amounts of finance in early stages of firms' development, which better matches financial needs of start-ups,
- positively contribute to ventures' ability to attract more financing, by giving positive signals to other investors and the market and reducing some of the informational asymmetry for other financiers, and

- increase the “quality” of firms through value-adding activities, such as advising, coaching and providing access to investor’s network.

Business angels also seem to exhibit a rather interesting geographical pattern in their investments; from what initially has been described as inherently local activity [e.g. 16,17], they seem to increasingly be overcoming geographical boundaries. Recent studies indicate an increase in long-distance investing (defined as investing outside comfortable driving distance from home), but also an increase in cross-border investing [19]. This however can vary significantly between countries and regions. Taken together, this means that we may need a new way of thinking to understand the geography of business angel investments.

The questions we ask in this paper are:

- *How does proximity influence the investment decision in business angel investments?* and
- *What does the interplay between the functional and relational dimensions of proximity look like in the investment decision?*

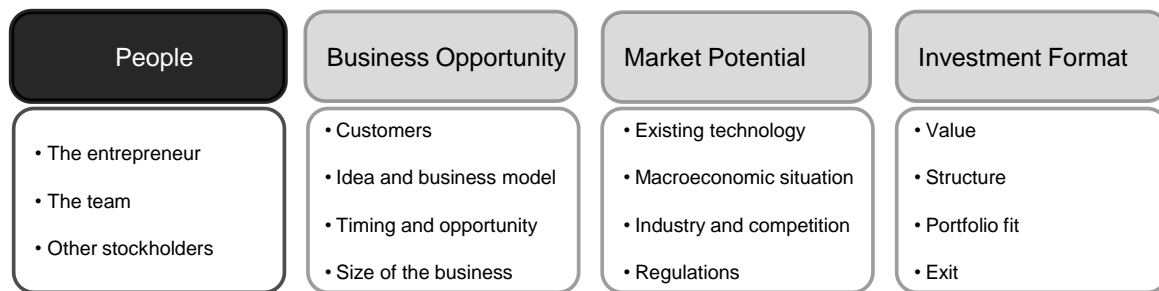
By answering these questions, we aim to contribute to an increased understanding of the role of proximity in business angel investments, and by that, the locational patterns of venture financing. We do this based on data from 226 investment situations gathered in fall 2014 from 56 business angels and 87 entrepreneurs in Sweden and analyzed using a state-of-the-art Structural Equation Modeling technique. The functional-relational proximity framework has to our best knowledge not been empirically tested before in the business angel research setting. Moreover, researchers have been calling for more primary studies to enrich the empirical basis of the business angel research field [20].

This paper is structured as follows. First, we review existing studies on actors’ decision-making in business angel investments, including the role of the geographical dimension. Second, we present the theoretical framework of functional vs. relational proximity. Further, we present the methodology of the study followed by the results and discussion and conclusions sections. We finalize by discussing some possible implications for knowledge and for practice.

### **3. Literature Review**

#### **3.1 *Business angel investment decision-making***

Previous studies have produced an extensive list of varied processes and decision-making criteria business angels use in their investment decisions [21–27]. A general finding is that there is no universal strategy or checklist of criteria used in the assessment process, and that the degree of sophistication in the evaluation procedure varies widely, from what can be described as simple assessment techniques to rigorous due diligence processes that touch upon numerous measures [24]. Helle [28] suggests that the key decision-making considerations of the investors nevertheless fall into four categories: the people, the business opportunity, market potential and investment requirements (see Figure 1).



**Figure 1:** Grouped investment criteria [based on 28]

In this paper, we focus on the *people* dimension of business angels' decision-making and specifically the relation between the investor and the entrepreneur(s). In the context of business angel investing, the people dimension is arguably the one that most significantly affects the investment decision, and previous research has repeatedly found that business angels, having less resources to do a rigorous due diligence and to legally enforce contracts, tend to compensate by putting more focus on the relational aspects [29,30]. We are however aware of that by focusing on the people dimension, we are only touching upon one aspect of the decision-making process.

### Proximity in business angel investments

When it comes to understanding the role that distance plays in business angel investments, the literature has provided a somewhat inconsistent picture. Studies have looked at both how important business angels consider geographical proximity and how actual investments are distributed. While in the first case, geographical proximity is often found relatively unimportant as an investment criterion, studies observing the actual geographic investment patterns find a clear link between geographical closeness and increased investment activity [31,32].

In the later years, however, this pattern may have shifted. Studies in the 1980s and 1990s usually found that between 60% and 75% of investments were made within comfortable driving distance from investor's home or workplace [e.g. 16,17]. Later studies, however, find a lower propensity to invest locally, in some cases under 50% [e.g. 31,32]. While some of this difference might well be due to different national contexts and definitional and methodological discrepancies, it may also be an indication that something is changing with regards to proximity in business angel investments.

### **3.2 Entrepreneurs' financing decision-making**

The literature on entrepreneurial finance traditionally treats entrepreneurs as agents and investors as principals in the investment situation, implying that the business angel is exposed to certain risks when making an investment and that he or she will seek to control that risk [e.g. 32]. Such a division, however, does not capture the exposure of entrepreneur when attracting external finance, particularly equity finance. In fact, while a business angel is exposed to risks and uncertainties, particularly the risk of failure of the venture and behavioral uncertainty of the entrepreneur; he or she has a possibility to differentiate his or her investment portfolio, thereby handling their overall risk exposure. Prior research [e.g. 33,34] has found that business angels on average allocate 5 to 20% of their assets to investments in unquoted ventures, hold portfolios of 4-5 ventures, and complement their business angel investments with investments in publicly traded stocks, real estate, art, etc. Thus, the potential consequences of a failure of an investment for an average business angel are rather limited.

The entrepreneur, on the other hand, is normally already highly committed to the venture with personal funds, time, reputation, etc. By bringing in an external investor, he or she might increase the exposure even further. Specifically in case of external equity investments, the entrepreneur has to share sensitive information about the venture that can be misused by the other party, give away decision-making power and stand a risk of potentially costly conflicts [37]. Therefore, we argue that it is important to remember the entrepreneur in the discussion of investment decision-making; firstly because the potential risk exposure of the entrepreneur makes the relationship between the entrepreneur and the investor of high relevance, and secondly because an investment that takes place implies that a positive decision has been made by the financier *and* the entrepreneur. The dataset that the empirical analysis in the paper is based on captures therefore both business angels' and entrepreneurs' investment decisions.

### 3.3 Approaches to understanding business angel-entrepreneur relationship

A number of studies within business angel research have looked at the individual relationship between the business angels and startup founders, and particularly what mechanisms facilitate exchange of information, knowledge transfer, and risk mitigation, and how those in turn might influence the deal [24,38–41]. The theoretical approaches that have been applied to understand this relationship can be summarized in four categories: social capital/network, human capital, organizational and geographical approaches.

Below is a summary of the key theoretical approaches and previous studies on business angels that offer different perspectives on the impact of the relationship on a funding decision (Table 1).

**Table 1:** Business angel research of the angel-entrepreneur relationship

Approach	Main findings
Social capital/network	Social embeddedness between the business angel and the entrepreneur, and their ability to build a long-term trusting relationship, is central for an investment to take place [29,42–44].
Human capital	Shared experiences, from a general life background, specific context knowledge or prior entrepreneurial experience, enable information exchange and set a common understanding between the investor and entrepreneur [43,45–47].
Organizational	Being associated with a professional organizational setting, or being connected through a context such as an association, incubator or even event, strengthens credibility in the relationship as it implies sharing the same reference space and knowledge [39,48–50].
Geographical	Geographical proximity is a significant factor in business angel investing, although the literature is inconclusive about the degree of this significance and whether geographical proximity is a compensatory or a non-compensatory factor [17,32,51–54].

From this brief review we can conclude that several aspects seem to be important when one tries to understand business angel investments and that it is most likely a combination of them that best explains investment decisions in business angel investments. We can also observe that the research is inconclusive about the role of geographical proximity in the investment

decision and the empirical evidence is partially contradictory. In attempt to reconcile this, we adopt the *functional-relational* proximity framework suggested by Moodysson and Jonsson [9] based on earlier works by Torre and Gilly [8] and Boschma [2]. This approach is to a large degree based on the theoretical development outlined above; what sets it apart however is that it synthesizes the explanatory variables along these dimensions to a number of *relational proximities* that exist alongside with the geographical proximity and affect both the need for geographical proximity and the probability of interaction. This approach thus puts the geographical and the non-geographical aspects of proximity into the same model. The next section outlines this theoretical framework and the hypotheses that guide the empirical analysis.

## 4. Functional-relational proximity framework

### 4.1 Dimensions of Proximity

#### Functional proximity

In its most basic definition, geographical proximity is the physical distance between two actors [55]. However, physical distance does not necessarily capture distance as it is perceived by the actors. The effort that it takes to interact seems to be more important than mere physical distance [9]. Thus, we adopt the functional definition of proximity and add dimensions of time and cost of travel and communication to the mere physical distance.

#### Relational proximity

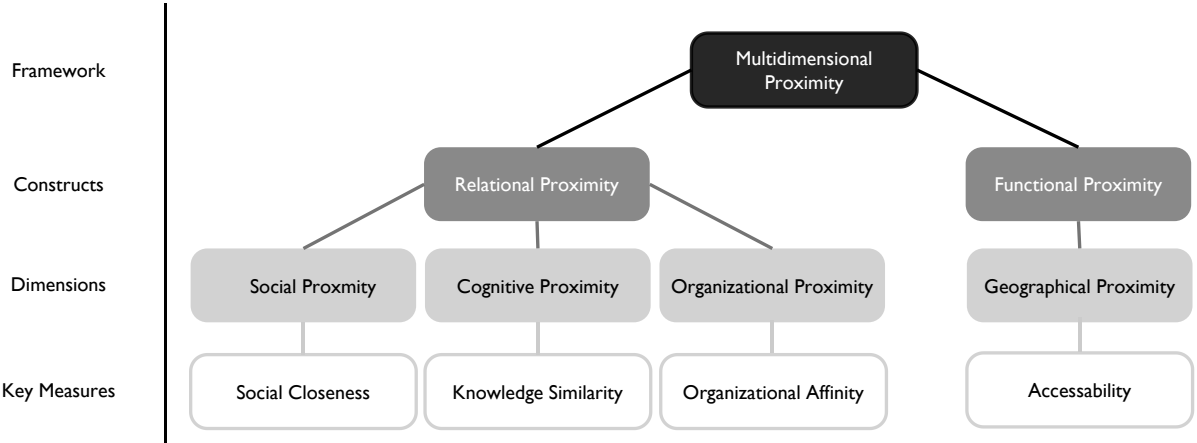
Relational proximity refers to the non-tangible dimensions of proximity that in this case encompass cognitive, social and organizational dimensions, as suggested by Boschma [2]<sup>1</sup>.

- *Cognitive* proximity is concerned with the similarities in the way actors perceive, interpret and evaluate the world [56,57]. Actors are cognitively proximate when they share a similar educational or professional background and thus have a similar frame of reference, which makes it easier for them to establish and retain relationships and carry out advanced communications [9].
- The concept of *social* proximity stems from the research in social embeddedness [7] and describes level of relationship between individuals in terms of trust based on friendship, kinship and experience [2,56]. If the level of trust in the relationship is high, individuals will be more likely to put themselves in a potentially vulnerable position, share sensitive information, etc. [44].
- *Organizational* proximity can in this context be described as actors belonging to same (broadly defined) organization and thereby having similar frames of references as well as adhering to same standards and norms of behavior [9]. Individuals that belong to the same organizations are arguably more likely to engage in interactions, can carry out more advanced communication and can to a higher degree rely on their counterpart.

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<sup>1</sup> We have not included institutional proximity in the framework because this dimension is primarily relevant in multi-national studies, as cross-border transactions often display significant differences in formal as well as informal institutional norms (Boschma, 2005). Since our study is based on a national survey, institutional influences are expected to be minimal.

Moodysson and Jonsson [9] make a strong argument for grouping the “non-tangible” dimensions of proximity under one umbrella, *relational proximity*. Firstly, there is a certain conceptual overlap between the dimensions, which makes it difficult to completely separate them in the empirical analysis. Secondly, as authors explain, the antecedents of these proximity dimensions are, at least partly, the same, which means that these different dimensions in practice often co-exist. We follow this recommendation and use the constructs of functional and relational proximity in our model. The functional proximity encompasses only one dimension, geographical proximity; thus, these terms are used interchangeably and encompass distance, time and cost variables. This is illustrated in **Figure 2** below.



**Figure 2:** Dimensions of proximity and associated measures

**4.2 Hypotheses**

Specifically in the context of business angel investing, based on the discussion earlier in this paper, we would expect that functional proximity has both a direct and indirect positive influence on the probability of investment. The *direct* effect would be due to the fact that local interaction normally comes at a lower cost than interaction over distance, at least in situations where face-to-face contact between parties is required. Further, being geographically proximate to the potential investment object, individuals can easier come across certain information that otherwise would not have been available to the, like subtle signs of others’ trustworthiness, competence and goodwill [31]. We hypothesize therefore:

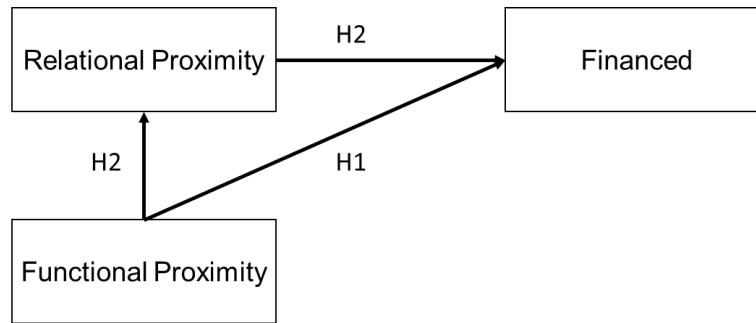
*H1: Functional proximity is significantly and positively related to the likelihood of positive investment decision in business angel investments when observed in isolation.*

The indirect effect would be due to the ability of geography to facilitate other proximity dimensions; individuals who reside close to each other are more likely to interact, engage in similar types of activities and share common norms and understandings [2]. Thus, we would expect that relational proximity partially mediates the relationship between functional proximity and probability of investment. We hypothesize therefore:

*H2: Relational proximity partially mediates the relationship between functional proximity and the investment decision in business angel investments.*

The hypotheses can be illustrated as following (**Figure 3**):





**Figure 3:** Hypothesized proximity relationship of the financing decision

## 5. Methodology

### 5.1 Sample and Procedure

The study was performed by utilizing a qualitative pre-study to assess and adapt our proposed proximity items, as well as a survey research design to test our derived framework in an empirical setting. The pre-study was conducted with 12 participants with equally distributed groups of (a) Experts on the field of informal venture capital and business angels (b) Active business angels and (c) Founding entrepreneurs of startups. The interviews were semi-structured and focused on identifying factors of proximity the interviewees perceived in the interaction between business angels and founders.

The survey was administrated electronically and data was obtained from 56 business angels and 87 entrepreneurs in Sweden (a response rate of approximately 40%). The respondents have in total provided data on 111 “taken” and 115 “not taken” investments. The details of this are summarized in the table below (see **Fel! Hittar inte referenskölla.**).

**Table 2:** Distribution of survey responses

	Business Angels	Entrepreneurs	Total
Total responses	78	119	197
Share of total population (in %)	13 - 19.5	.47 - 5.61	.76 - 7.81
Estimated response rate (in %)	32.54	47.98	40.26
Eligible for further analysis	56	87	143
Investment taken	56	55	111
Investment not taken	53	62	115
Total Investment opportunities	109	117	226

The sample collection of previous research in the business angel field has been criticized as researchers often employed convenience samples that do not necessarily reflect the overall business angel market [31]. As random samples are however difficult to obtain and often impractical, researchers have suggested a variety of sampling methods and recommended to combine those to minimize the resulting sampling bias [35,58,59]. We follow those research suggestions and join several distribution methods, as well as samples from business angels

and entrepreneurs to obtain a minimally biased sample from the Swedish business angel investment market. We employed a clustering survey distribution, in which individuals were contacted both directly and through intermediary organizations, such as associations, incubators, and business angel networks [60,61].

## **5.2 Questionnaire Design and Measures**

The general structure of our survey was adapted from Shane and Cable [62], who divided their sample of formal venture capitalists and business angels into two randomly selected groups: one group was asked to think of the most recent seed-stage investment that they made, the other about the most recent seed-stage investment they evaluated, but did not make.

Initially, respondents were asked to identify themselves as either private investors, entrepreneurs, or none (ending the survey). We chose the identification as private investor instead of the term business angel, as the latter is subject to ambiguity, if not thoroughly defined [63]. Both business angels and entrepreneurs were in turn presented with a similar set of questions measuring proximities in relation to a specific investment opportunity. One submitted respondent survey could thus include datasets of one actual investment, one investment opportunity evaluated but not invested, or both. Additionally, both parties answered questions to qualify for the eligibility for our sample.

The items for measuring dimensions of proximity were adopted from previous literature in the social sciences field and our pre-study interviews. The spatial measures distance, time and cost were measured by adapting the scale of Aguilera [64] with the categorical items ultra-local, local, regional, and national. The social tie dimension was measured by three categorical items of previously either knowing the other party directly, through contacts or not at all [62,65]. The remaining measures of educational, professional, entrepreneurial, organization, membership, cooperation and social closeness were measured using a 6-point Likert scale. Finally, all respondents were asked to provide answers regarding their gender, age and working place (city) that were recorded as control variables. The measured items with their literature origin can be found in *Appendix A*.

## **5.3 Data Analysis and Methods**

In a first step our resulting data set was restructured and tested on assumptions underlying the further analysis (see section 5.4). Second, confirmatory factor analysis (CFA) was conducted to aggregate our observed variables to constructs that resemble the proposed proximity constructs of our framework. Lastly, we constructed structural models based on the causal relationships proposed by proximity theory, using the Maximum Likelihood Estimation SEM approach. We developed two structural SEM models to determine the mediation effect of relational proximity on the relationship between functional proximity and the likelihood of investments.

SEM, which is a “multivariate technique combining aspects of factor analysis and multiple regression that enables the researcher to simultaneously examine a series of interrelated dependence relationships among the measured variables and latent constructs (variables) as well as between several latent constructs” [66], is an appropriate analysis method in our research case for several reasons. The framework of this thesis, based on the proximity theory, includes multiple dependent relationships as well as latent constructs [66]. Thus, both required

concepts can be included in a holistic model rather than taking a two-method approach of a separate CFA and multiple regression. Moreover, SEM is superior to the latter approach in that it accounts for the measurement error of the observed data, and thus should model the observed relationships more accurately [66]. Our analysis includes the examination of a mediation relationship, for which SEM has been proposed as advantageous to classical mediation determination using regression analysis [67]. The utilized software for our analysis is the programming language R and therein the SEM package lavaan [68,69].

#### 5.4 Sample Size, Reliability and Normality Assumptions

An often discussed limitation of SEM is its relatively large required sample size to return stable results [66,70]. Hair [66] recommends sample sizes based on the constructs used in the model and communalities (squared standardized construct loadings). The in the following section developed model contains only two constructs, and shows average item communalities of high to moderate ( $> 0.5$ ). The recommended minimum sample size of 150 observations is unambiguously exceeded with 225 complete observations [66].

The model was tested for overall reliability and construct reliability with Cronbach's alpha [71,72]. All items and constructs, as well as overall reliability exceed the proposed cutoff criteria of 0.7 [66,73] (see **Table 3**). Moreover, since our sample consists of two heterogeneous groups, business angels and entrepreneurs, we tested for reliability differences in and between those groups. To compare the two groups we test for the Null-hypothesis that both groups are equally reliable [72,74]. The Null-hypothesis can be retained with a p-value of 0.215 (significance level  $p = 0.05$ ), and thus both groups will be pooled in the future analysis.

**Table 3:** Cronbach's Alpha for total sample, business angels and entrepreneurs

<b>N = 225</b>	<b>Total</b>	<b>Business Angel</b>	<b>Entrepreneur</b>
1. Financed	.77	.80	.74
<b><u>Relational</u></b>	<b>.71</b>	<b>.72</b>	<b>.72</b>
2. Educational	.75	.79	.72
3. Professional	.74	.79	.70
4. Entrepreneurial	.75	.78	.72
5. Closeness	.74	.77	.71
7. Organization	.74	.77	.70
8. Membership	.74	.78	.70
9. Cooperation	.74	.78	.71
<b><u>Functional</u></b>	<b>.94</b>	<b>.93</b>	<b>.96</b>
10. Distance	.73	.77	.70
11. Time	.73	.77	.70
12. Cost	.72	.76	.70
<b>Total</b>	<b>.76</b>	<b>.79</b>	<b>.73</b>

The SEM assumes normally distributed data [66]. By testing for univariate normality of each item we retain all items except for organization, which exceeds both skewness and kurtosis cut-off criteria [75] (see **Table 4**). In Mardia's test for multivariate kurtosis we find a standardized z-value for kurtosis is 2.80, which approaches but does not exceed the proposed threshold of 3.00 [76]. It can therefore be concluded that the collected dataset approximately fulfills the conditions of both univariate and multivariate normality.

**Table 4:** Univariate normality analysis (with Z-Values = Skewness | Kurtosis / Standard Error)

N = 225	Mean	Std. Deviation	Skewness	Skewness Z-Value	Kurtosis	Kurtosis Z-Value
Financed	1.49	0.50	0.04	0.11	-2.01	-3.11
Education	2.99	1.63	0.27	0.84	-1.17	-1.81
Entrepreneurial	3.38	1.63	0.03	0.09	-1.26	-1.96
Professional	3.21	1.59	0.18	0.54	-1.16	-1.80
Cost	1.53	0.91	1.47	4.53	0.82	1.27
Distance	2.09	1.05	0.68	2.09	-0.72	-1.12
Time	1.92	0.98	0.78	2.40	-0.46	-0.71
Cooperation	2.22	1.63	1.03	3.17	-0.33	-0.51
Membership	2.40	1.63	0.73	2.24	-0.91	-1.41
Organization	1.62	1.27	2.03	6.26	2.93	4.54
Closeness	1.55	1.77	0.62	1.92	-1.00	-1.55

## 6. Results

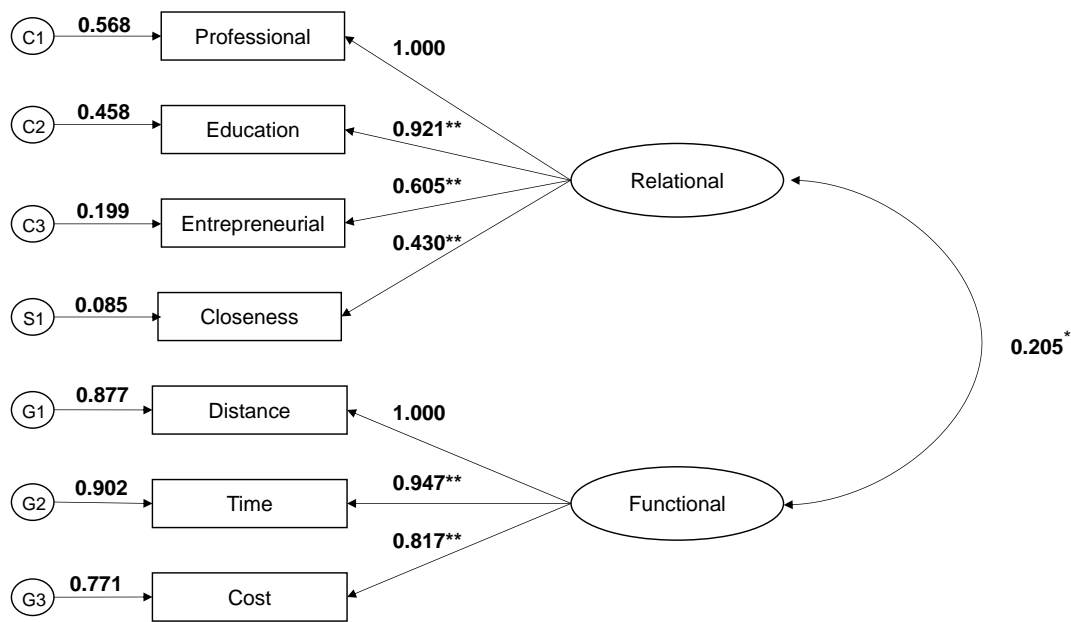
As the combination of proximity dimensions in the relational construct is not unequivocally agreed upon, we first tested different structural model designs to determine the relational construct with the best fit. When observing overall model fits and  $X^2$ , we find that including social and cognitive proximity, but disregarding the organizational dimension results in the best fit in all measured models (see **Table 5**). Thus, the following analysis of the measurement and structural model will be based on the dimensional combination of variation 3 (social, cognitive and geographical dimension).

**Table 5:** Model selection with different relational proximity combinations

Model	Proximity Dimensions	Path	Factor Loadings	Significance	$X^2$	Fit
1	Cognitive	PR $\leftarrow$ R	1.000		0.002	CFI = 0.969
		ED $\leftarrow$ R	0.932	p < 0.01		TLI = 0.955
		EN $\leftarrow$ R	0.624	p < 0.01		RMSEA = 0.067
	Organizational	ME $\leftarrow$ R	0.572	p < 0.01		SRMR = 0.059
		CO $\leftarrow$ R	0.536	p < 0.01		
	Geographical	DI $\leftarrow$ F	1.000			
		TI $\leftarrow$ F	0.947	p < 0.01		
		CO $\leftarrow$ F	0.817	p < 0.01		
2	Social	CL $\leftarrow$ R	0.663	p < 0.01	0.015	CFI= 0.982

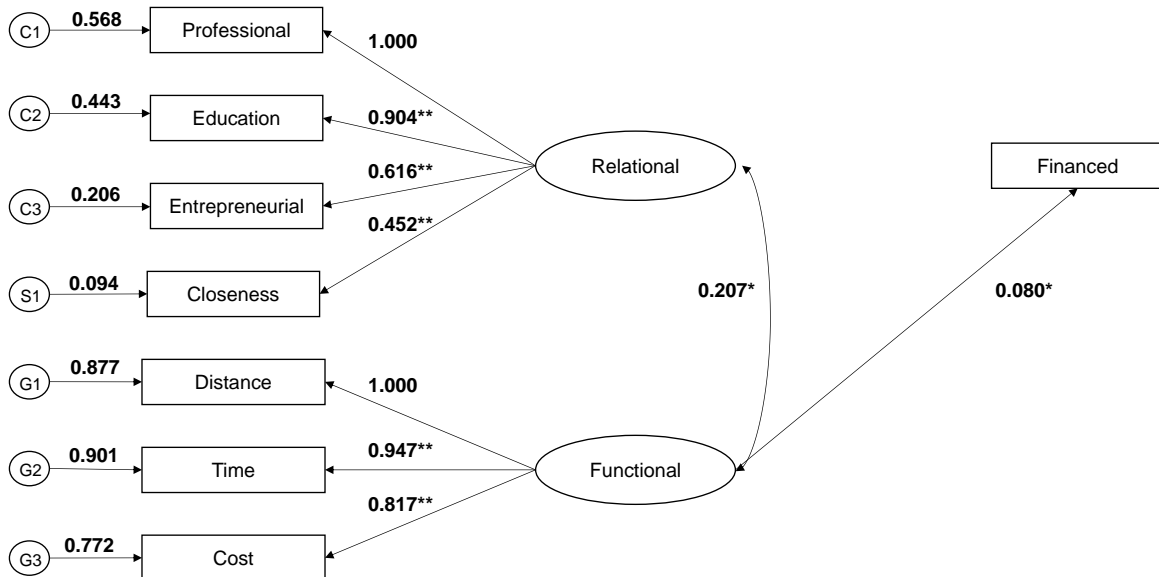
Model	Proximity Dimensions	Path	Factor Loadings	Significance	X <sup>2</sup>	Fit
3	Organizational	ME ← R	1.000		0.039	TLI = 0.969
		CO ← R	0.650	p < 0.01		RMSEA = 0.069
	Geographical	DI ← F	1.000			SRMR = 0.047
		TI ← F	0.946	p < 0.01		
		CO ← F	0.817	p < 0.01		
	Cognitive	PR ← R	1.000			
		ED ← R	0.904	p < 0.01		
		EN ← R	0.616	p < 0.01		
	Social	CL ← R	0.452	p < 0.01		
	Geographical	DI ← F	1.000			
TI ← F		0.947	p < 0.01			
	CO ← F	0.817	p < 0.01			
4	Cognitive	PR ← R	0.994	p < 0.01	0.000	CFI = 0.939
		ED ← R	1.000			TLI = 0.917
		EN ← R	0.705	p < 0.01		RMSEA = 0.085
	Social	CL ← R	0.728	p < 0.01		SRMR = 0.064
	Organizational	ME ← R	0.780	p < 0.01		
		CO ← R	0.679	p < 0.01		
	Geographical	DI ← F	1.000			
		TI ← F	0.947	p < 0.01		
		CO ← F	0.817	p < 0.01		

The resulting path diagram of the measurement model 3 is shown below (see **Figure 4**). The factor loadings are all above the recommended threshold of 0.5, with the exception of the social closeness dimension [66]. This factor loading is however significant at  $p < 0.01$ , approaches the threshold and will therefore be retained. The lower value can likely be explained by the combination of the social and cognitive dimension into one construct. The measurement model was additionally tested for indiscriminant validity by combining all 7 indicators into one construct [66]. The resulting model fit is in all regards inferior to that of the two-construct model and indiscriminant validity is therefore assumed.



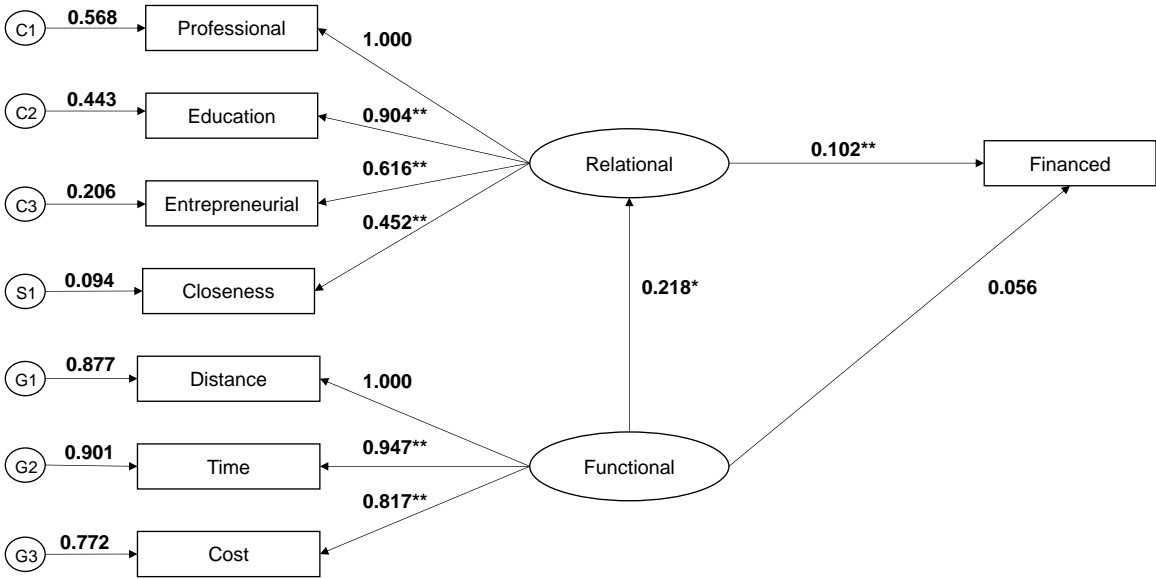
**Figure 4:** The confirmatory factor analysis (\*\* =  $p < 0.01$ ; \* =  $p < 0.05$ )

To test our first hypothesis, we construct a structural model that includes the two constructs of relational as well as functional proximity, defined by their indicators, and the financing decision outcome as dependent measured variable (see **Figure 5**). Functional proximity is defined as the only determinant of the financing decision. A significant influence of functional proximity on the financing decision can be observed, if no involvement of relational proximity is assumed. Thus, *Hypothesis 1* can be retained, as functional proximity has a significant positive influence on the financing decision.



**Figure 5:** Path diagram of the direct effect of functional proximity (\*\* =  $p < 0.01$ ; \* =  $p < 0.05$ )

The second structural model now considers the mediating relationship suggested in our conceptual framework (see **Figure 6**). The causal relationship between functional proximity and the financing decision becomes insignificant, while a causal link between functional and relational proximity, as well as relational proximity and the financing decision can be observed. These results imply a fully mediating effect of relational proximity with regards to the relationship between functional proximity and the financing decision. When accounting for the mediation relationship in the SEM model we receive significant results for both the indirect (0.022), as well as total effect (0.079) of the mediation. We therefore reject our *Hypothesis 2* in favor of a full mediating effect of relational proximity.



**Figure 6:** Path diagram of the structural mediation model (\*\* =  $p < 0.01$ ; \* =  $p < 0.05$ )

### 7. Discussion and Implications

In this paper, we have set out to examine the influence of proximity on investment decision in business angel investments. We have used Moodysson and Jonssons [9] functional-relational framework as a point of departure and hypothesized that functional proximity would be significantly and positively related to the likelihood of positive investment decision when observed in isolation and that this relationship would be partially mediated by relational proximity. We studied this based on data from 226 investment situations gathered in fall 2014 from 56 business angels and 87 entrepreneurs in Sweden.

Our results indicate a confirmation of prior research in business angel’s geographical investment patterns [32,52,63]. The investment decision in our model is partially determined by the functional proximity of investor and entrepreneur, when observed in isolation. The effect is significant but of low strength, which can be expected as the investment decision is a complex outcome with many different determinants not considered in our model [28,77,78].

Our results furthermore support conceptual studies in the field of business angels that have hypothesized a mediating relationship of relational factors in the investment decision process [31,32,51]. Contrary to previous research, we find this relationship to be fully mediating. This

means that the initial influence of functional proximity on the investment decision can be fully explained by relational factors that mediate it.

How can we understand and interpret these findings? Particularly – *is geography irrelevant in business angel investing?* Based on the outcomes of this study, our best answer to this question is – geographical proximity is relevant as far as it facilitates other proximity dimensions. While the direct influence of geographical proximity is very moderate, and disappears altogether when the relational proximity is introduced, it is a strong predictor of relational proximity. When these proximity dimensions co-exist, geography matters in business angel investing. Similarly, we argue that in cases when relational proximity in entrepreneur-investor relationship is developed and sustained over distance, geography can potentially become unimportant in the investment decision.

Thus, while scholars and practitioners naturally are interested in the issue of *whether* geographical proximity matters in business angel investing, a better research question would perhaps be *when* geographical proximity matters and *for whom* it matters in the context of business angel investing. This is in line with prior studies that have repeatedly found that business angels is a heterogeneous group that exhibit a variety of characteristics, attitudes and behaviors, that also can change over time, with experience and in different contexts (e.g. [33]).

### **7.1 Suggestions for further research**

Some possible ways to develop knowledge on the *situational* role of geographical proximity is to consider possible drivers of locality of business angel investments. For instance:

- The nature of *knowledge* that is required to recognize and evaluate the investment opportunity. Depending on whether an investment requires local knowledge that has a strong tacit dimension and is better made sense of and applied in the local context [e.g. 78] or knowledge about a certain industry or technology that can be codified thereby easier transferable [9], the role of geographical proximity may be different. Therefore, future studies of the role of proximity in business angel investments may benefit from integrating the framework of different knowledge-bases [80,81] developed in the field of economic geography and used to explain for instance localization patterns of innovation collaborations.
- The investors' *motivations* and *financial commitment*. Literature on business angel decision making largely assumes that business angels are rational economic actors who make financial decisions in face of uncertainty and risk (and sometimes also defines business angels as primarily economic actors, [e.g. 31]). Yet, we see a broadening of types of investors and investment behaviors (such as “micro investors” and “crowd-investors”), and thus need to pay more attention to the variety of potential investment motivations contexts and characteristics, and how they can affect the role of geographical proximity [82]. For instance, Avdeitchikova [31] when comparing business angel investments to “micro investments” found that in smaller investments, investments that involved no or little post-investment involvement and in investments motivated by other criteria than financial, geographical proximity was both less prevalent and considered less important. Therefore, the question of *what we mean*



*when we talk about business angels* is very important, since a considerable heterogeneity can be expected along the geographical dimension.

Further, the entrepreneur side of the relationship is perhaps the most poorly understood one. Here, we have argued that entrepreneurs are exposed to considerable risks and uncertainties when attracting external finance and therefore may seek to mitigate those. While the empirical analysis shows that entrepreneurs' behavior in terms of relying on functional and relational proximities is not significantly different from business angels', the nature of the potential risks and uncertainties may well be different, especially when they are related to the proximity aspect. Thus, the relationship between entrepreneurs' decision-making in business angel investing and proximity needs to be explored.

Better understanding when and for whom geographical proximity is important would also allow developing policy instruments and tools that better address the needs of certain types of investors and entrepreneurs. For instance, when developing digital match-making platforms, what may work for crowd-investing, where investors often are motivated by other factors than financial returns, invest little money and have very limited decision-making power (and involvement ambitions) in the venture that they invest in [82], is likely not the same that will work for business angels that invest considerable amounts of money, expect financial returns and often get actively involved in the strategic leadership of the venture[63].

## **7.2 Limitations**

Our research and its results need to be considered with several limitations. First, our developed framework has thus far not been empirically applied to the field of business angels. Past empirical studies of the proximity framework in other fields vary significantly in their context, utilized proximity dimensions, constructs and results [83], which makes a comparison and analogical use impractical. Our employed survey scales have shown to be reliable in our context, but require further confirmation in future studies. Further, we have not applied a specific definition of business angels and allowed individuals to a certain degree self-select for participation in the study, which is, while not uncommon, still methodologically problematic, as it reduces comparability with other studies [63].

In addition to the mentioned methodological limitations, the scope of our study limits its generalizability. The survey was only carried out in Sweden and can therefore not consider functional or relational considerations in a cross-border setting. Moreover, business angel markets in their characteristics depend on national contexts, and thus our results could be limited to the Swedish market [84–86].

## **8. Conclusion**

The purpose of this paper was to examine the influence of functional and relational proximity on business angel investments. Based on Swedish data from 226 investment situations and using Structural Equation Modelling, we find that the investment decision is partially determined by the functional proximity of investor and entrepreneur, when observed in isolation. This effect is however fully mediated by relational proximity, consisting of social and cognitive dimensions.

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# Appendix

## Appendix A

Type	Dimension	Function	Previous theoretical measure*	Pre-study finding of measures	Variables measured in survey
Functional proximity	Geographical	Physical distance	-Time -Distance -Cost	-Time between offices -Time between meeting points -Transport distance -Convenience of location -Cost of travelling	<b>[Geographical]</b>  <b>[Distance]</b> - Physical distance between offices <b>[Time]</b> - Travelling time between offices <b>[Cost]</b> - Approximate cost of travelling between offices
Relational proximity	Cognitive	Knowledge and experience	-Type of education -Level of education -Type of role -Industry experience -Entrepreneurial level	-Type of education -Length of education -Non-professional experience -Position/role -Type of job -Type of skills -Entrepreneurial experience	<b>[Cognitive]</b>  <b>[Educational]</b> - Similar types of educational background <b>[Professional]</b> - Similar type work experience from either job position or industry <b>[Entrepreneurial]</b> - Similar entrepreneurial experience
	Social	Connectedness	-No ties -Indirect ties -Direct ties	-Previous contact -Acquaintanceship -Friends -Family or relatives -Strength in relationship	<b>[Social]</b>  <b>[Ties]</b> - No connection, connection through mutual connections or direct personal connection <b>[Closeness]</b> - Strength in relationship
	Organizational	Solidarity, credibility, culture- and value understanding	-Belonged to same organization -Affinity from previous organizational branch cooperation or partnership	-Affinity from events -Affinity from associations, societies or clubs -Affinity from similar or same companies	<b>[Organizational]</b>  <b>[Organization]</b> – Affinity from working together in the same company <b>[Membership]</b> – Affinity from a mutual connection through network or association <b>[Cooperation]</b> – Affinity from cooperation through events or similar activity